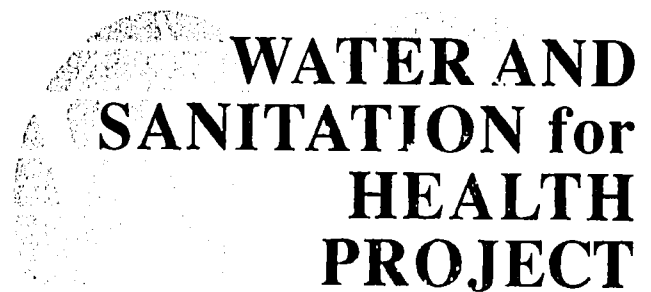


F I E L D R E P O R T

TECHNICAL ASSISTANCE PROGRAM  
FOR THE MINISTRY  
OF WATER RESOURCES,  
SULTANATE OF OMAN  
TASK 2B: TRAINING

Field Report No. 327  
February 1991



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**TECHNICAL ASSISTANCE PROGRAM  
FOR THE MINISTRY OF WATER RESOURCES,  
SULTANATE OF OMAN**

**Task 2B: Training**

Prepared for the Omani-American  
Joint Commission for Economic and Technical Cooperation  
under WASH Task No. 177

by

Thomas Leonhardt

February 1991

Water and Sanitation for Health Project  
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Thanks also to the staffs and personnel of the other agencies and organizations, both public and private, who provided support during our stay in Oman.

## **ACRONYMS**

<b>BC</b>	<b>British Council</b>
<b>DG</b>	<b>Director General</b>
<b>IPA</b>	<b>Institute for Public Administration</b>
<b>MWR</b>	<b>Ministry of Water Resources</b>
<b>NICE</b>	<b>National Institute for Computer Education</b>
<b>OAJC</b>	<b>Omani-American Joint Commission</b>
<b>OJT</b>	<b>On-the-Job training</b>
<b>OTIC</b>	<b>Omani Technical Industrial College</b>
<b>RFP</b>	<b>Request for Proposal</b>
<b>TOT</b>	<b>Training of Trainers</b>
<b>USAID</b>	<b>United States Agency for International Development</b>
<b>USGS</b>	<b>United States Geological Service</b>
<b>WASH</b>	<b>Water and Sanitation for Health Project</b>

## **EXECUTIVE SUMMARY**

Responding to a request for technical assistance from the Sultanate of Oman's Ministry of Water Resources (MWR), the Omani-American Joint Commission for Economic and Technical Cooperation (OAJC) contracted with the Water and Sanitation for Health (WASH) Project to help the ministry's newly created training department develop training plans and strategies for the next five years. From 23 September to 1 November 1990, Thomas C. Leonhardt of Training Resources Group, a WASH subcontractor, worked with the MWR training department to achieve the following objectives:

1. Assist the training department and other MWR personnel to develop a pedagogically and technically sound training program for newly recruited hydrological technicians.
2. Assist the MWR to develop a specific one-year plan and a more general five-year strategy for training ministry personnel.

The consultant worked in Oman and in the United States during September and October 1990, in tandem with another WASH team charged with evaluating the ministry's database management and water-analysis laboratory needs. (See Appendix A for a list of persons contacted.) This report reviews findings and sets forth the conclusions and recommendations made to the ministry.

To ensure that the technical assistance would be of maximum benefit to the ministry, from the point of view both of helping the training department become a fully functional entity and of helping it to visualize more clearly its role in strengthening the ministry as an institution, the methodology of the consultancy employed a series of well-defined steps:

1. Entry
2. Establishing a working relationship with the client
3. Interviewing
4. Evaluating existing resources
5. Updating OAJC and ministry officials
6. Reviewing data and information collected
7. Identifying themes, trends, and issues
8. Drawing conclusions and making recommendations

During discussions with ministry officials and the OAJC, the consultant identified, in addition to the two specific tasks included in the overall scope of work, several other tasks that would be useful in helping to put the two original tasks into a much broader framework. An example of such a task would be to help the training department clarify its various activities and also determine which staff would be responsible for which tasks.

All of the tasks, carried out in close collaboration with the training department staff, would have a specific outcome useful and practical in helping the department consolidate its role inside the MWR. Following the methodology described, the consultant and the training department worked toward outcomes that would contribute to the two broader goals of the assignment: strengthening the training department and thereby the ministry itself.

### **Principal Findings**

The MWR is an organization in rapid expansion. Over the next year or so, it will hire many new employees, most of whom will need some immediate training. This will present a unique challenge, both to the ministry as a functioning organization with a well-defined mandate and to the training department as the group responsible for ensuring that newly hired (as well as already employed) personnel receive enough training to do their jobs.

The training department, created in the spring of 1990, has a staff of four. Its first major task was to organize a training course for 45 newly hired hydrological technicians. (This process was underway before the consultant's arrival, thus modifying somewhat the scope of work). In addition to this task, the department is organizing English lessons and computer classes for many MWR employees. During this start-up period, the department has also had to come to grips with the issues and questions that arise when a department is set up within an organization which itself is just over a year old.

It was in this context that the consultant defined the tasks of the technical assistance assignment. Based on observations and on data and information gathered during interviews with ministry personnel and other sources, the following are offered as principal recommendations for the training department:

1. Consolidate its role within the MWR by continuing to define its activities, the roles and responsibilities of its staff, and its own systems and procedures, and by making these known to the other departments.
2. In collaboration with the regional offices and the technical staff, improve the next two technician training courses by setting course objectives based on the technicians' job descriptions.
3. Use the 1991 plan and the 1992-95 strategy as flexible guidelines for developing a coherent set of training activities that match ministerial policy and goals.



## Chapter 1

### INTRODUCTION

#### 1.1 Background

Oman's newly created Ministry of Water Resources (MWR) is an organization in rapid expansion. Over the next year or so, it will hire many new employees, most of whom will need some training. By strengthening the MWR's training department, the ministry will gain skilled staff to carry out the technical and administrative tasks needed to help it achieve its mandates (set out in Royal Decrees 82/88 and 100/89).

In response to a ministry request for technical assistance, the Omani-American Joint Commission (OAJC) contracted with the Water and Sanitation for Health (WASH) Project to help MWR's training department develop plans and strategies for the next five years. WASH provided a consultant to complement the efforts of the MWR staff, two other WASH teams working in tandem with the consultant on the data management systems and water analysis laboratory tasks, and the Water Resources Master Plan being prepared by Mott MacDonald International Ltd., a British consulting firm.

The project's scope of work was formulated by Robert Thomas of Camp Dresser & McKee International, who visited Oman in February 1990. During his stay in the Sultanate, Mr. Thomas interviewed numerous MWR staff to identify key areas where the ministry needed assistance and then developed an overall assistance strategy, with an accompanying plan for addressing those areas. Following OAJC's approval of this proposed scope of work, a WASH project team was assembled to carry out the first two tasks of a six-task series. Task 1 consisted of activities relating to data management. Task 2 consisted of two related activities, training and laboratory upgrading, the subjects of this report and WASH Field Report No. 325. The four other tasks in the overall scope of work will be implemented in 1991.

#### 1.2 Scope of Work

The overall goals of the six-task water resources technical assistance program are to —

- Develop and implement supplementary data-collection programs focused toward future resource management activities.
- Develop resource-management preparatory activities that can be undertaken parallel with the MWR master plan currently being prepared.

- Strengthen MWR resources for water resources management.

The third goal, *strengthen MWR resources*, includes four subgoal areas, one of which is the training activity of Task 2. In order to help achieve that subgoal, two components are included in the formal scope of work for the training activity:

- Assist the MWR's training department to develop a pedagogically and technically sound training program for the newly recruited hydrological technicians.
- Assist the MWR to develop a specific one-year plan and a more general five-year strategy for training ministry personnel.

During initial discussions with ministry staff (especially those of the newly created training department) and with the staff at OAJC, 11 other topics emerged that would help provide the context for these particular components in the scope of work.

1. *Define the overall training function in a technical organization such as the MWR.* Organizations that elect to have a training function need to think about which activities will be included; in other words, the training function needs to be tailored to the demands of the organization, and the structure of the training department will depend on the organization's various activities. In the MWR, many training activities that are part of the training function will be generic (conducting needs assessments, for example), while others will be more specific (managing off-shore training).

*Outcome:* List of specific activities for which the training department will be responsible, as the main implementor of training.

2. *Clarify which training activities will be the responsibility of the training department and which it might share with other ministry departments.*

*Outcome:* Description of the roles other departments play in helping the training department carry out its activities.

3. *Define the roles and responsibilities of the training department staff.*

*Outcome:* Responsibilities chart for the training department staff (see Appendix B).

4. *Identify necessary inputs from other ministry departments that will help the training department carry out its activities.* Not only will other departments have some responsibility for carrying out parts of the training

function, but the training department will also depend upon input from other ministry sections and departments to help the ministry have fully trained personnel.

*Outcome:* Description of necessary inputs from other MWR departments.

5. *Seek institutional support for the training department at the highest technical and managerial levels of the MWR.* Training departments are often the institutional stepchildren of an organization. Valuing training as an indispensable part of strengthening an institution, particularly at the policy and philosophical levels, is essential for successful functioning of a training unit. If learning is not valued by the decision-makers, training will have no place in the organization.

*Outcome:* Suggestions for a strategy to obtain institutional support for the training department, particularly at the policy-making level.

6. *Develop a systematic training course for the newly recruited hydrological technicians.* A substantial input of new hydrological technicians will strain the ministry's administrative resources and will require that it take a systematic approach to training the technicians. Since a syllabus for training these technicians will contribute to this effort, the consultant worked with the hydrological instructor hired for the first group of technicians and the training department staff to arrive at a structured curriculum that will serve as a basis for training the next two groups.

*Outcome:* Proposed curriculum outline for training the next two groups of technicians and a follow-up strategy for refresher courses and on-the-job training (OJT) (see Appendix C).

7. *Develop a proposal for training activities to be undertaken in 1991.* In discussing the scope of work with His Excellency, the Undersecretary of the MWR, a decision was reached to develop a plan for continuing the systematic training of ministry staff into 1991. The undersecretary felt that this plan should be as specific as possible, while the 1992-95 plan should remain general.

*Outcome:* Plan for each of the five categories of MWR personnel who will be trained in 1991, with approximate dates, location, and subject matter.

8. *Assess locally available resources to help the training department carry out its activities.* This task involves two subtasks: assessing local training institutions for their capability to handle the two upcoming training programs

for technicians, and evaluating the same institutions for their ability to offer language, computer, management, and other courses to ministry personnel.

*Outcome:* Description of local institutions that are most appropriate for helping the training department.

9. *Evaluating the possibilities for off-shore training to be financed by donors as part of the MWR's long-term training strategy.* Since many ministry training needs cannot be met in Oman, overseas training at institutions that can satisfy those needs will be necessary. Off-shore training must be carefully monitored for choice of candidates, choice of institution, source of funding, length of course, student progress, and reentry into the ministry.

*Outcome:* Plan for possible off-shore training.

10. *Develop a longer-term strategy for training at the MWR to help guide its thinking about the development of its human resources and how training will contribute to strengthening the MWR as an institution.* During 1992-95, the ministry will undertake to train most of its personnel in a wide range of subjects. Each group of employees will need to have relevant training in as short a time as possible to help the ministry fill its slots with skilled employees. If this monumental effort is not approached systematically, the ministry will be unable to fulfill its mandate. Training not only must seek to develop the ministry's human resources, it also must contribute to strengthening the ministry as an institution. It can do so by addressing what are called "institutional goal areas." The major areas for which training can be useful are management development, systems and procedures development, training systems development and skill building, and structural and organizational adjustment.

*Outcome:* Longer-term strategy for training MWR personnel and description of goal areas and how the training department can contribute to strengthening that area.

11. *Propose strategies for overcoming some of the barriers that presently confront the training department.* Any new department inside an organization confronts problems and barriers that hinder its smooth functioning. These barriers need to be identified and analyzed, and solutions sought to reduce their impact on the training department.

*Outcome:* Barriers identified and strategies proposed for overcoming them.

## 1.3 Methodology

In order to ensure that the scope of work would be successfully completed, helping the training department itself become a fully functional entity and also helping it visualize more clearly its role in strengthening the MWR as an institution, the methodology of the consultancy employed a series of well-defined steps. Each step led toward completing the assignment and thus meeting the objectives in the scope of work.

1. **Entry.** The most important task during the consultant's entry into the client's environment is to get the "lay of the land." This involves becoming familiar with all of those aspects, elements, and factors that will impinge on his/her ability to carry out tasks. During the first few days at the ministry, the consultant met key personnel, reviewed pertinent documents, briefed with WASH team members already on-site, and generally listened to and observed goings-on at the ministry.
2. **Establishing a working relationship with the client.** In order to ensure that the client, in this case the training department, felt secure with the consultant and understood the tasks he was to carry out, the consultant spent time with the two members of the department to discuss his scope of work, how useful the anticipated outcomes would be for them, what other tasks besides the two that were prescribed the consultant might be able to help them with, and to generally listen to their concerns and observations about their roles and work in the newly created training department. This team-building with the training department was an ongoing process, and department staff accompanied the consultant on most of his visits outside the MWR. The consultant kept the department apprised of all his activities as they were conducted and shared with them his thoughts and ideas as they arose.
3. **Interviewing staff.** Once the consultant had validated his general scope of work with the training department, OAJC, and other ministry officials and had then clarified the new parameters (since much had changed from the initial needs-assessment visit in early 1990), interviews with all levels of ministry personnel took place. These interviews served several purposes: to inform MWR employees about the purpose of the consultant's visit, to solicit their help in assessing the needs of their particular departments, to listen to their opinions about priority training needs for the MWR, and to seek their ideas about what the MWR's training strategy should be over the next couple of years. Training department staff felt that the consultant should conduct these interviews alone, since their presence might influence the nature of the answers.

4. **Evaluating resources available to the ministry for training.** To give the training department an impartial view of local training institutions, both public and private, the consultant visited as many of these as time would permit. This assessment was to help the ministry find an institution capable of managing the next technician training and also to discover which institutions can offer both public and custom-designed courses for the MWR's training needs.
5. **Updating OAJC and ministry officials.** The entire WASH team met weekly with OAJC to present the most current findings and thinking about the project and to receive OAJC input. The consultant to the training department met twice with the undersecretary of the MWR, who serves as executive director of training, to keep him apprised of progress. When possible, daily meetings were held with the training department.
6. **Reviewing data and information.** During the interviews, the consultant was able to collect a lot of information and data concerning the role of training and the training department in the MWR. This information and data need to be analyzed to sort out the points that are relevant to the assignment.
7. **Identifying themes, trends, and issues.** It often happens that certain themes and trends begin to stand out clearly; these in turn become issues that will need to be addressed. Identifying and clarifying these issues with the ministry's personnel constitutes a crucial step in the process, since the consultant risks giving the wrong interpretation to the findings. The consultant, in effect, holds up a mirror to the organization and asks people if what he sees is what they also see.
8. **Drawing conclusions and making recommendations.** The final step of the process is to draw conclusions: sometimes the findings are obvious and need no interpretation; other times, the findings may have multiple interpretations, and it is the consultant's job to find which is the proper one before making final recommendations.

Following a systematic series of steps for carrying out a technical assistance mission helps ensure that the tasks are completed in a timely and efficient way and at the same time allows the consultant to build into his/her procedures the time needed for the institutional strengthening that will help guarantee continuation of the activities undertaken during the assignment.

## **Chapter 2**

# **HYDROLOGICAL TECHNICIAN TRAINING**

### **2.1 Overview**

This chapter deals with the hydrological technicians' training course. This is the first task in the scope of work under "training as a means toward strengthening the MWR's resources." After some background information about changes in the scope of work, the chapter describes the first training course and how it was conducted and presents certain observations that may help guide the planning and implementation of the second and third courses. Next, the report details the rationale and design for the two upcoming courses and, finally, makes specific recommendations concerning the upcoming technician training course.

### **2.2 Introduction and Background**

As detailed in the scope of work, there are two tasks for the training component: the first is to help the MWR develop a training course for newly hired hydrological technicians. When the original scope was written, there was no training department within the MWR, and the job of training the new hydrological technicians was to be contracted out. Thus, the original scope calls for the consultant to establish terms of reference to guide the MWR in developing a request for tender (proposal).

Upon arrival in Oman, the consultant learned that the MWR had created a training department that was already functioning. Because the MWR felt an urgent need to get the newly recruited technicians into some kind of training, the department had put together a course and had asked a local computer-education company to manage it for them. After some initial start-up problems, the course got under way.

The course began the same week the consultant arrived in Oman; thus, it was too late for his input into this initial course for the hydrological technicians. Under the circumstances, it was decided that the consultant could be most useful developing a consensus among MWR personnel about what should be included in a course for the next two groups of hydrological technicians who will be trained under ministry auspices. If the course were to be contracted out, the consultant's report would serve as the basis for developing terms of reference for a request for proposal (RFP). If, however, the MWR decided to manage the job itself, the report could serve as a guide for managing logistical and technical aspects of the course.

## **2.3 First Technician Training Course**

### **2.3.1 Course Description**

Forty-five future hydrological technicians enrolled in the ministry's first course, starting their classes the last week in September 1990. When they finished the course the first week in November, they had completed approximately six weeks of training broken into hydrology (60 hours), English (50 hours), computer-use (20 hours), and mathematics (50 hours).

The National Institute for Computer Education (NICE) was responsible for managing the overall course and the computer component. Hydrology was taught by Amin Wardem, on contract with the ministry. English classes were subcontracted to the British Council. The mathematics instructor was Mr. Harvey, who worked on contract to NICE.

All classes, with the exception of the field visits, were held on the NICE campus in Al-Khuwair. Some trainees were housed at the Al-Falaj Hotel and transported to NICE by bus; others were housed at different locations. Participants attended classes from 7:30 a.m. until 3:00 p.m. Saturday through Wednesday. Classes were approximately two hours long with half-hour breaks during the day.

There is coordination between Mr. Wardem and Mr. Harvey concerning the kinds of mathematical skills necessary for the hydrologists to master. The English class used a standard text, and there appeared to be no hydrological vocabulary being taught. (There appeared to be no resistance to doing so if the ministry could have supplied a vocabulary list.) The hydrology course was structured to be a topical overview and included an introduction to numerous subject areas.

Although the consultant was unable to interview the trainees before writing the report, during observations they appeared interested, motivated, and anxious to learn. The instructors said that, with a few exceptions, the participants were doing well. NICE was making a final report on the course, which it was to hand over to the ministry when the evaluations were in. Participants were evaluated weekly and the results shared with the ministry training department.

### **2.3.2 Observations from the Course**

The training department noted that, in the rush to put together a course for the technicians, several important details had been overlooked. These should be considered before the next course begins in mid-January 1991. Some major observations follow:

- During the course start-up, no ministry officials were on hand to explain to the participants the overall course objectives and how the course would fit into the MWR's strategies and mandate.



- The hydrology instructor received little or no guidance from the technical arms of the ministry on what to teach in a basic hydrology course.
- Forty-five participants are too many for the type of highly technical training that needs to be offered to a group of hydrological technicians.
- Logistical arrangements left many participants housed in a hotel, but several were unable to find suitable accommodations.
- The hydrology instructor's teaching load left him little time to prepare for the next day's classes or to devote to the needs of individual students.

## **2.4 Second and Third Hydrological Technician Courses**

### **2.4.1 Rationale and Course Design**

The MWR, whose mission is to manage Sultanate water resources, is expanding its staff to include a group of new hydrological technicians. These technicians will play an integral part in helping the MWR carry out its mandate. They will be posted in the various district offices, and their main tasks will be to collect and record data from various water sources, synthesize their findings, and write and send reports and samples to headquarters.

The ministry hopes to attract candidates to this program who have already completed secondary school and have a solid foundation in English and mathematics. Although some have been following the science and chemistry streams, they will need an introductory course to hydrology. After completing an initial six-week training, the technicians will join those already in the field and will start performing some of the technical tasks for which they are responsible. There will also be an extended period of OJT in the field. Thus, the MWR is placing a great deal of importance on the training of the technicians during the initial course.

The purpose of the initial, multifaceted training program will be to mold this diverse group of recruits into a high-performance cadre of technicians capable of carrying out their tasks. They should be able to think and react creatively to the many problems (technical and logistical) they will face in the field. The appropriate skills, knowledge, and attitudes that will form the basis of the training program need to be blended into a carefully crafted training program.

Given the nature of the work to be carried out by the participants, it will be essential to develop a hands-on, experiential, and practical approach to designing the curriculum. (See Appendix C for Technician Training Course Proposal.)

### **2.4.2 Training Team**

The training course should be headed by a program coordinator who will be responsible for the curricular and administrative aspects of the course. This person might be assisted by an administrative aide who will organize the program's logistical aspects.

Qualifications and experience for each are presented below:

#### ***Program Coordinator***

- Experience with training course administration.
- Familiarity with principles of adult learning.
- Knowledge of experiential training methodologies.
- Familiarity with local resources, institutions, and Sultanate procedures.
- Knowledge of basic water resource management a plus but not viewed as essential to the successful running of the program.
- Excellent communication skills in Arabic and English to coordinate with MWR officials on the program's technical and administrative aspects.

#### ***Administrative Aide***

- Experience with training program logistics including scheduling, student registration, student tracking, field trip planning, etc.
- Familiarity with locally available resources such as vehicle rental, catering services, computer instruction centers, etc.

Both program coordinator and administrator should expect to work full time on the course.

### **2.4.3 Training Site**

Training will take place in the vicinity of Muscat and should be at a site conveniently accessible to the MWR. The field-trip sites are to be designated by the program coordinator in collaboration with the ministry training department and the hydrology instructor.

The training site should have adequate facilities, i.e., classrooms and the necessary audiovisual and teaching equipment. However, some classes may need to take place at a different site; in this case, the logistics coordinator should arrange transportation. The training site should include facilities for meals and coffee breaks. Instructors should work for the training institution or be readily available on a contract basis. All contract personnel will be accountable to the training institution, which in turn will be accountable for all aspects of the program.

#### **2.4.4 Description of Work**

In collaboration with the MWR, the program coordinator should—

- Help carry out a detailed needs assessment for the participants, to determine their proficiency in various content areas including (but not limited to) written and oral English; mathematics, as this discipline relates to the hydrological aspects of their work; science; and various other work-related skills such as map reading, use of compass, geography of Oman, and elementary computer skills.
- Develop skill and knowledge-based learning objectives that relate directly to the needs assessed.
- Develop a study curriculum that programs the training sessions over a six-week period, including field trips the ministry deems necessary to ensure that the training is as practical as possible. The coordinator should also specify the instructional and training techniques used to meet program objectives. These should include (but not be limited to) classroom lecture, field trips, role plays, simulations, demonstrations, and practical exercises.
- Develop an ongoing system to evaluate participant progress, including pre/post-tests and appropriate evaluation methods for use during the course. Progress toward the objectives should be monitored on a weekly basis and reports drawn up for the MWR.
- Put an administrative system into place that will track the attendance of participants, which courses they have attended, etc.
- Carry out other duties deemed necessary by the MWR to ensure that the course achieves its objectives.

#### **2.5 Recommendations**

In view of lessons learned from the first course and in light of MWR needs for highly trained technicians to perform essential tasks in the regional offices, these are recommendations for the second and third technician training:

- One hour of the course should be given to ministry staff, who will explain the structure, functioning, organization, and purpose of the MWR to the new recruits and also describe how the recruits will fit into the scheme of things.
- The ministry should give the hydrology instructor as much technical guidance as possible. This guidance should be based on the ministry's experience with the technicians' job descriptions and with what they will need to carry out their jobs in the field.
- The number of trainees should be held to 20 in order to facilitate instruction and logistics, and to ensure that the trainees receive as much individual attention as possible.
- Trainees should be housed together, preferably near the training site.
- Of the 80 hours suggested by the present hydrology instructor, at least 20 should be taught by MWR staff on topics they deem relevant to the technicians' jobs. This will relieve some of the enormous burden on a single hydrology instructor.
- Technical personnel in the ministry, working with the hydrology instructor, should determine whether the initial course in basic hydrology should be an overview of all subject areas usually associated with hydrology or whether several priority subject areas should be taught in depth.
- The number of hours devoted to computer-use should be reduced to 10 (introduction only), and Arabic should be introduced as a subject for 30 hours of study during the six weeks.

## Chapter 3

# TRAINING FUNCTION OF THE MINISTRY OF WATER RESOURCES

### 3.1 Overview

This chapter first provides general background on the MWR and the training challenges faced by this new ministry. Sections 3.3 and 3.4 look at the status of MWR training in general and the training department in particular: its activities, issues that affect departmental performance, staff roles and responsibilities, and finally, how the department can contribute to the ministry's overall institutional development. Another section (3.5) discusses the suitability of local institutions for helping the MWR meet its training needs.

### 3.2 Introduction and Background

The MWR is expanding the size of its workforce at an accelerated pace; over the next year or so, it will add several hundred new employees to its ranks. Although some of these newly hired employees will arrive at the MWR fully trained, the majority will need immediate training to enable them to take on their tasks and ongoing training to help them perfect their skills as they move through the organization. (See Appendix D for MWR's Human Resource Needs.)

This influx of new personnel, both trained and untrained, will present a unique challenge to the ministry. As an institution with a well-defined mandate, it will need to take time from its day-to-day administrative and technical activities to devote adequate time and resources to managing the newly recruited people. Failure to oversee this monumental institutional change in human resources will have an immediate impact upon the MWR's ability to function as a predominately technical organization. Not only does the ministry have a unique challenge, but all possibilities are open to it in the area of training. As one interviewee put it, "I would characterize the training that went on in the various incarnations of the MWR as sporadic and nonsystematic. Indeed, there were debates as to whether or not people should even be trained." It appears that the last formal training for field technicians took place in 1980. The MWR is in a position to change that.

At present, the MWR has approximately 150 staff working at the central ministry and in the five (soon to be thirteen) regional offices. The ministry itself is organized into four directorates—Regional Affairs, Water Resources Assessment, Water Resources Management, and Finance and Administration. In addition, several smaller units fall directly under the authority of the minister. The training director reports directly to H.E. the Undersecretary, who is executive director of training.

Since the MWR is newly created (having been born out of the Public Authority for Water Resources in October 1989), the lines of authority are still in flux. The ministry is working on a final version of its organizational chart, and so the training department might eventually end up somewhere else on the organizational table.

### **3.3 Status of MWR Training**

The training department, created in the late spring of 1990, has a staff of four: a director, an expatriate training administrator, a secretary, and an assistant. With the exception of the training administrator, the other staff members are new to the area of training. Their inexperience is counterbalanced, however, by their strong desire to make the training department function and by institutional support from the MWR's upper-level management. Not only is the department working hard to begin systematizing training within the MWR, it is also looking inward to develop its own vision, procedures, and place within the ministry.

There has been discussion about creating a training committee composed of H.E. the Undersecretary, the training director, the training administrator, and representatives from the managerial and administrative arms of the ministry. Recommendations for the committee's specific mandate were being drawn up as this report was written.

As far as current training is concerned, the training department inherited a legacy of English language and computer training, which is ongoing throughout the MWR. The ministry has approximately 50 people in English language training at various private institutions in the Muscat area, 4 people in computer training, and 4 people in off-shore technical courses.

Most of the people interviewed stressed the need for English language training. When asked why, people responded with various reasons: software is in English, professional literature on hydrological topics is mainly in English, the expatriate staff does not speak Arabic (regional offices are directed by expatriates, for example.)

Computer training was second on the list of overall training needs, and the training department has been placing staff into the various courses offered by local private schools. To its credit, the department is organizing enrollment lists of who is attending what courses. (See Appendix F for Training Strategy for Data Management Systems, which also appears in WASH Report on same.)

Technical training in foreign colleges and universities plays an important role in grooming MWR employees for upper-level management and technical jobs. The MWR currently has 21 returnees in its ranks and in 1991 plans to place about 10 employees in foreign institutions for management and technical training. (See Chapter 4 for specific plans for 1991.)

Currently, two people from the ministry have completed an evaluation of their writing skills and will be enrolled shortly in a writing-skills course.

At present, there appears to be no other type of formal training occurring at the MWR. OJT is continuous at the regional offices but is not structured, systematized, or evaluated in any formal way by the MWR. Most regional directors appear to favor OJT and would be willing to take the time to support training in the field.

## **3.4 Training Department**

### **3.4.1 Introduction**

As noted, the training department was created in spring of 1990. Its staff of four is working to systematize training within the MWR and to develop its own set of procedures. In order to get to the two tasks as they are set out in the scope of work, the consultant and training department staff decided it would be useful to undertake some other tasks that would help the department sort out some of the issues and questions that confront a newly created department (see 1.2). Among these 11 tasks were the following:

- Developing a definition for the goal of the MWR's training function
- Deciding which training activities the department would be responsible for
- Sorting out the roles and responsibilities within the department
- Identifying and addressing various issues that will affect the smooth functioning of the training department
- Helping the department define its role within the ministry as an instrument for strengthening the organization as a whole
- Developing a training department vision statement

#### **Vision Statement**

The training function at the MWR seeks to strengthen the ministry by ensuring that its personnel receive enough appropriate training to carry out their jobs in the most effective way possible, thus contributing to the overall goal of the ministry.

In collaboration with the two professional staff members of the training department, the following table of activities was developed. (Appendix B attributes responsibility for these activities.)

## Table 1 Training Department Duties and Responsibilities

### Primary

1. Identify training needs.
2. Analyze needs.
3. Define needs.
4. Look for training opportunities at home and abroad.
5. Liaise with donor agencies and other ministries.

### Administrative

1. Maintain records of individual staff and training courses.
2. Maintain information on training institutions.
3. Prepare annual budgets and keep expense records.
4. Send out letters of intent.
5. Draw up contracts for tailor-made courses.
6. Act as secretary to the training committee.
7. Inform all departments and district offices of forthcoming training programs.

### Miscellaneous

1. Act as internal human resources consultants.
2. Participate in training committee meetings.

### In-House

1. Manage on-the-job training.
2. Locate in-house specialists.
3. Design courses in consultation with specialists.
4. Provide administrative support to trainers.
5. Seek agreement of training committee for activities.
6. Evaluate training.

### Local

1. Contact institutions.
2. Furnish specifics for proposals.
3. Select institutions.
4. Seek approvals as appropriate.
5. Send letter to Ministry of Civil Service.
6. Inform institutions of decision and help them with course content.
7. Follow up individual trainee reports.
8. Evaluate training for feedback.

### Foreign

1. Locate new institutions.
2. Build up information base of training institutions.
3. Coordinate with personnel department.
4. Process application papers.
5. Seek internal, Civil Service, and Education Ministry approvals.
6. Coordinate with foreign donor agencies.
7. Place staff in appropriate courses.
8. Follow up during training.
9. Evaluate training for feedback.



### 3.4.2. Issues Facing the Training Department

1. **Issue:** The red tape involved in getting MWR employees into training and, once they are enrolled, the need to reapply after completion of each level.

The training department, thus staffed, is having a difficult time following the bureaucratic procedures and dealing with the paperwork necessary to get personnel into language and computer training. One objective of the training department is to get people trained in certain skill areas, and to do this, it is often necessary to complete the training one level at a time. The training department would like to be able to move an employee through a series of levels without having to reapply each time.

**Proposed action:** Obtain "blanket" permission for each employee who is about to undertake language or computer training; this permission would cover the employee through all the training levels. For example, employee A needs to achieve Intermediate II level at the British Council but is presently at Elementary. His blanket permission for training would cover the courses up to Intermediate II, and he would not be obliged to reapply after completing each level—nor would the training department be required to redo the paperwork.

2. **Issue:** Perception of the training department role within the other MWR departments.

The training department should be viewed as a "facilitator" within the MWR—helping the various departments upgrade the skills of their personnel. The department will need to get feedback from the other departments and section heads concerning their training needs, and thus must be able to go right to the source. The department cannot fulfill its mandate if it encounters resistance or bureaucratic barriers.

**Proposed actions:** First, continue to educate the MWR's managerial personnel concerning the role and functions of the training department. A clear understanding of what the department is trying to accomplish will go a long way toward dispelling any concerns about having it talking to ministry personnel. Second, try to obtain interdepartmental agreement that the training department will not need formal permission to contact ministry employees where training issues are concerned. This does not imply that the department should circumvent or abuse the principles of good institutional communication.

3. **Issue:** Employee perception of how training opportunities are offered and to whom

As training within the MWR evolves, it will become clear to employees that there are two different "tracks" of training available: one is a "softer" skills track that will include DGs, directors, and section heads. This track will be aimed toward management training, but will also be crosscutting, as it concerns technical as well as purely managerial staff. The second track will involve technical training for the water resources (technical) staff and skills training for the support staff.

**Proposed action:** Care must be taken when selecting people for the different kinds of training, since one type of training should not become viewed as the "road to promotion" (advancement, salary increase) within the ministry. In conjunction with department and section heads, the training department should make every effort to balance the placement of employees in the different types of training, taking appropriate numbers from the different directorates.

4. **Issue:** Training department staffing

In the immediate future, the training department will be called upon to manage a significant load of work: OJT, technician training, overseas placement, guest lecturers, etc. The present staff will be insufficient to handle the workload.

**Proposed actions:** As soon as possible, the department should acquire more clerical help (for typing, filing, and some translation). This would free Nagla (secretary) to help Usha (training administrator) liaise with the various training institutions around town, tracking and monitoring trainees. Eventually the profile of the training department should include one director, two associate directors (one a training specialist and one a part-time advisor for water resource and hydrological training), and secretarial and clerical help as needed. The department should also think about a data management specialist who can set up the employee database for tracking employee training.

5. **Issue:** Support for training at the highest ministry levels

The training department has been developing a training approach that it feels will meet the needs of the MWR, a combination of practical and theoretical training done with the goal of Omanizing the departments and upgrading the skill levels of the MWR's employees. The support of all ministry staff and personnel, particularly at the highest levels, will be necessary to carry this out.

**Proposed actions:** Allow a representative from the training department to attend the monthly staff meetings. Also, arrange for at least one debriefing a month with the

minister and undersecretary to keep them informed about training department progress and activities.

6. **Issue:** Dependence on outside trainers

It is a given that the MWR's technical staff is fully occupied, both at the ministry and in the regions. Nevertheless, there needs to be some training taking place in-house. This would be a ministry-specific training in technical areas for which outside expertise would be difficult to find and expensive.

**Proposed action:** Train some of the more-experienced field technicians in basic training techniques through a standard two-week training of trainers (TOT) program.

### 3.4.3 Training Department Role in Strengthening the MWR as an Institution

The training department will play an important role within the MWR by helping it become a stronger, more effective and efficient organization. The department's obvious role is to help the MWR strengthen its most valuable resource—staff—by finding appropriate training opportunities for both technical and managerial staffs.

However, there are other areas in which the training department can significantly affect the ministry's development. One way of viewing this is to think about how the training department will work in what might be termed institutional "goal areas." These "major streams" become the target of interrelated strengthening activities carried on within an organization by the various departments, including training.

The major goal areas are as follows:

1. Management development
2. Systems and procedures development
3. Training systems development and skill-building
4. Structural and organizational adjustment

#### **Management Development**

A major undertaking of the training department will be to work with MWR management to ensure that personnel who occupy management and leadership positions within the ministry receive the necessary training to help them carry out their difficult tasks.

\*A management development program is not a management training course, although management training should be an element of it. A well-conceived program to strengthen management will aim at changing managerial behavior in the work place. This program would coincide with the development of new systems (delegation of financial authority, improved procedures, performance review, etc.). The program should provide systematic and long-term support to management.... If addressed thoroughly, the goal area should include on-the-job support and coaching for managers at all levels.... *It should also include short courses or workshops in management skills, tailored to the needs of the institution* (not ready-made, imported packages). A management development strategy should start with the top management and flow down through successive layers of supervision.

It is in this context that the training department has proposed a unique approach to working with MWR management. (See Section 4.1, Training Plan for 1991.) The specific role of the training department will be to find courses and workshops that address the needs of MWR management personnel, and to make sure that upper levels of management see the importance of management skill-building as part of the training department's purview.

A less-specific role for the training department in this goal area is to act as a human resource development consultant to MWR personnel. Since it is unlikely that the ministry will hire a full-time management specialist to be part of the personnel department, the training department will, of necessity, have to assume some of those functions. These activities will have as their objective "the systematic and long-term support of management."

### ***Systems and Procedures Development***

Identifying and selecting which systems and procedures to strengthen will depend upon an institutional needs assessment. Improved standard operating procedures can be developed for all MWR departments by developing and using manuals, forms, checklists, etc. Technical areas can develop procedures for investigations, design, procurement, construction supervision, etc. In the financial area, procedures can address fixed-assets inventories, budgeting, financial planning, inventory control, billing, etc.

For overall management control, management information systems have evolved that include overall performance measures and unit performance standards.

The objectives of developing systems and procedures are twofold: to develop a needed, controllable standard of excellence...and to *train staff in how to develop and carry out their procedures*. Implanted systems and procedures (for example,

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\*This quotation and the five that follow are taken from WASH Technical Report No. 49, *Managing Institutional Development Projects: Water and Sanitation Sector* (1988).

those proposed by outside experts with no ownership by the personnel within the organization) invariably fail.

Thus, in this goal area, the training department will work on two fronts: it will be developing its own systems and procedures and also working with other departments to help them develop systems and procedures and *then find training that will give their staffs the necessary skills to manage and run those systems and procedures.*

### ***Training Systems Development and Skill-Building***

An institution's ability to manage growth, develop problem-solving skills, and increase its technical competency requires that it be able to develop and maintain its own staff.

A developed institution is a learning institution. In successful water and sanitation institutions that WASH has studied, training is everybody's job and so is learning. *Developing a training capacity within an institution is critical to sustaining project inputs for the long term. Staff may come and go, but an institution must be able to pass on knowledge and skills.*

Key elements of a training system include a core staff of training specialists, training materials, needs-assessment tools, and hands-on training expertise. Successful approaches usually spread the training function throughout an institution by coaching supervisors and managers in training techniques. This equips supervisors to train on the job....

Here again, the role of the training department falls into two broad categories: it must develop itself (staff, materials, and tools), but must also be willing to train other managerial personnel in how to become effective trainers. *Training units broaden their capabilities by developing core curricula and by training trainers.* On-the-job training, which will become such a large part of the MWR's training approach, can only be accomplished when mentors have enough training knowledge and skills to ensure that they are correctly conveying information and effectively teaching the necessary skills to their "trainees."

### ***Structural and Organizational Adjustment***

An institution need not always reorganize in order to develop itself. In fact, many would argue that the surest way to threaten people...is to undertake massive reorganization. However, most institutional strengthening efforts require at least some of the following: adding and dropping functions, moving toward increased decentralization or amalgamation, or combinations of both.

In the case of the MWR, one element of this structural and organization adjustment will come in the form of a large input of entry-level personnel. The training department has already started to play a key role in this "adjustment" by starting to manage the training of the newly hired hydrological technicians. As new personnel are added at higher levels, the training department should play an active role in their orientation to the ministry and should also be aware of any short- and/or long-term training needs they may have.

Successful implementation of structural change requires a careful process of developing and communicating new roles, developing and *training* new procedures, and promoting a high degree of involvement from those whom the changes will affect.

The training department, far from having its role limited to training MWR personnel, will be able to have a considerable influence in helping the ministry see its way through the institutional changes related to the growth of its staff and to the establishment of new procedures and systems.

#### **3.4.4 Vision (Mission) Statement for the Training Department**

One issue the training department faces as it begins to look inward toward its own development is that of defining a departmental goal. This goal (or mission statement) will establish what the department seeks to accomplish and guide the department as it undertakes all the activities for which it is responsible. The vision furnishes a working statement of where the department wants to be within a given period of time. It also serves to unify departmental efforts. Made public, the statement allows others to share in the training department's mission.

The following was developed as a first draft of a mission statement (vision or goal) for the training department (see box on next page). It will need continual updating as the department reaches specific goals and as its influence spreads throughout the ministry.

#### **3.4.5 Training Department's Relationship to Other MWR Departments**

The training department will be responsible for carrying out most activities falling under the training function. However, other ministry departments will be actively involved in helping to see that MWR training is successfully implemented. This will be in addition to each department's receiving many of the training department's services.

Concerning its primary activities (see Table 1), the training department will rely on all other departments to help it scan for training needs. It alone, however, should analyze and define those needs as they become known. The department will also count on others to help it

### **Vision Statement for the Training Department**

By the end of 1995, the training department of the Ministry of Water Resources seeks to have the directorate heads, department heads, and section heads trained with the necessary skills for effectively managing their respective offices. The technical staff should be trained with all the basic skills and knowledge necessary for them to carry out their technical functions, and several technicians should be trained as in-house trainers. Technical staff should also have completed the majority of specialized courses so they are current with the most recent trends and developments in the area of water resources management. The training department itself should be Omanized, with a full staff including director, training specialist, and hydrological advisor. The graduates will have assumed various management roles, and the support staff will be able to run the various departmental systems efficiently and effectively in order to support the Ministry's technical and managerial functions.

— Training Department  
October 1990

Identify training opportunities at home and abroad, and will especially need help in evaluating programs and courses that MWR staff have attended. The training staff will count on upper-level management to help them liaise with donors, other ministries, and the Sultan Qaboos University.

For training activities conducted in-country, the training department will need most assistance in managing OJT that takes place in the regions. (See section 4.3.1 for a detailed discussion of OJT within the context of the MWR.) The department would also benefit from technical assistance furnished by hydrological specialists within the ministry, since it has no technical person on staff as yet. These specialists can help by giving workshops on technical matters, advising the department on overseas courses or verifying the subject matter of a technical program.

Probably the most collaboration with another department will be with Personnel. Training and Personnel will need to maintain open communication: Personnel will furnish the training department with new recruit profiles, data about previously attended training courses, etc.; Training, for its part, will need to keep Personnel current on who has completed what courses, who will be attending off-shore courses, etc. All departments will need to communicate training needs as they are identified.

## **3.5 Resources Available to the Training Department**

### **3.5.1 Local Training Institutions**

Several private and public institutions in the Muscat area are available to the training department to help it carry out its mission.

#### ***National Institute for Computer Education***

NICE has two buildings located in the Al-Khuwair area, with a total of nine classrooms. The company plans to expand in the near future, adding a library with reading room and installing a better-equipped canteen. NICE is completely private (no government ownership); it was the first institute in Oman to be recognized for computer instruction.

As a private institute, NICE can respond to any request from a client. It is also willing to cooperate with other institutions when necessary (for example, for English classes they can work with the British Council).

NICE has also started to offer a series of management seminars and workshops on such topics as leadership, interviewing skills, and interpersonal skills enhancement, with a promised one-day follow-up for courses offered to the public. Courses are presently conducted in English, and NICE hopes soon to be able to offer them in Arabic. The company has done a TOT.

A brief observation of a leadership workshop organized by NICE indicated that the participative approach and subject area are very relevant to some of the MWR's management training needs. Although off-the-shelf courses are generally not recommended for increasing management skills, this course, with its focus on understanding group dynamics and the principles of leadership, would be a most viable alternative for MWR. NICE is able to do dedicated courses or would also mix MWR management trainees with personnel from other organizations. When asked about finance and accounting, NICE staff said that they can tap visiting professionals for such courses.

This type of private organization has several advantages when considering it for the training of hydrological technicians: it has flexibility (there are no times when it cannot accept student input), and it has the ability to coordinate all aspects of the training course: logistics, housing, field trips, etc. The MWR could hand over the entire package to them. The disadvantage would be the cost: since it is private, it will probably cost the MWR more in terms of per-student fees. Nonetheless, the price per trainee should be weighed against how much of the overall responsibility the institute will take on.



Any private Institute will also be able to tailor courses to ministry needs. This is extremely important, since there appear to be relatively few courses open to public enrollment that respond satisfactorily to the particular needs of an organization.

### ***Institute for Public Administration (IPA)***

This institute is run by the Ministry of Civil Service, and as such is open to civil servants working for the Omani government.

The IPA starts its academic year in January. In 1991, they plan to offer approximately 42 courses directed toward management, computer, and English skill-enhancement. The management courses go from financial, clerical, and secretarial through report-writing to more conceptual topics. The courses take place Saturday through Tuesday, 8:30 a.m. to 12:30 p.m., and last from four to six weeks.

The IPA has designed specific courses for ministries, and these are given in the evening. Each ministry is expected to pay 5 ROs per hour per instructor; overtime is also charged to the client. The overhead expenses are paid by the IPA. Doing a tailored course takes about four weeks for the entire process.

The catalogue will be ready in November, and circulars are sent to the various ministries. Demand is very heavy: as many as 300 may want to sign up for English classes, and IPA can take only 25. The same is true for the computer classes. The only admission requirement is that the candidates all be school-leavers (the equivalent of high school graduates).

The IPA is planning a one-day meeting for undersecretaries and a three-day seminar for DGs in manpower planning; they also give courses for section heads in such topics as running meetings and public relations. The institute admitted that it could not be very flexible since its site is occupied in the mornings.

The IPA's course offerings should be carefully considered by the ministry, especially in the area of its management classes. It is not, however, an appropriate venue for the technician-training course.

### ***Oman Technical Industrial College (OTIC)***

OTIC is a two-year vocational training school for secondary school graduates. It has a broad curriculum, with a business and a technical track, and has done courses for ministries on demand. At OTIC, as at IPA, the client pays only for the instructor, at the going government rate of RO5/hour.

The facilities are available during July and August, but no staff are accessible. Evenings are also available for courses, but since this is the only time that OTIC is free, it would probably be unable to conduct the technicians' training.

A syllabus is available, and the MWR should check it for relevant courses. Courses for English and computer would be available at OTIC, and any program could be tailored to client needs. Thus, it could serve as a resource for different types of training that would be required by the ministry. The school seems eager to accommodate any client.

The consultant was especially concerned about the need at MWR for laboratory technicians, once the new lab is built. The principal said that OTIC is doing lab courses for other ministries, and that the MWR should make its needs known as soon as possible. (English is part of OTIC's lab-tech program and of other programs that it offers.) Contact should be established with the principal as soon as possible to explore the possibilities of having OTIC offer a laboratory technicians' course tailored to water analysis needs.

### ***British Council (BC)***

This facility, located in Al-Khuwair/Medinat Qaboos area, encompasses a library (with an excellent collection of U.K. college and university catalogues), computer-assisted learning center with approximately six video games and interactive video learning centers, six classrooms, and administrative offices. The BC is prepared to offer all types of courses, although tailored courses take a while to prepare (depending on the content). The BC has done many courses on demand for various ministries and will actually go into the field and conduct a needs assessment if staff feel the vocabulary for a particular course is technical enough. The BC offers a course on report writing, one of the frequently stated needs for ministry personnel.

While discussing levels of competency in English, BC staff felt that the Intermediate II level was the lowest acceptable level for taking a technical course in the U.K. but that a higher level was needed for academic work. For graduate work, a special exam (the ILTS) is given to prospective students; this test rates a student in one of nine bands for various skills. The test is sent to the student's prospective institution, where the faculty will evaluate whether the student is ready for higher-level study.

The BC expressed interest in managing the next two technician trainings and would probably do an excellent job administering the technician program, although it would have to be done at a different facility. The BC would need the training department's help with logistical aspects of the course and would also need to rely on the department for hydrological input. It is not clear what kind of priority the school would give to a training program such as for the technicians, since it already has quite a heavy teaching load.

### ***Capital Institute***

The Capital Institute, located in downtown Ruwi in a two-story complex, has six classrooms, a small library, a computer room, and a reception area where students seem to congregate during breaks. The Institute offers a wide range of classes to the public (focussing on business skills, English, and computer). It is affiliated with International House, a U.K. organization with offices all over the world. The parent company conducts regular quality-control visits of all its affiliates.

The acting director expressed interest in managing the upcoming technician-training courses, and the Institute would probably do a good job.

The training department should immediately audit several Institute courses: basic office skills, intermediate office skills, and business report writing. From the course descriptions found in the Institute's brochure, these would seem to be what the ministry needs for much of its support-staff training, and during an audit visit, the training department would be able to evaluate the suitability of these courses.

### ***Sultan Qaboos University***

The training director and the consultant paid a preliminary visit to the university to make contact with the computer department, the language center, and the College of Science. In an interview with the dean of the College of Science, it became clear that not only will the university be an important source of future MWR employees (especially in chemistry and earth sciences), but it will also be interested in collaborating with the MWR on a scientific basis (particularly in the areas of water chemistry). This initial visit should be followed up immediately by the protocols necessary to establish a formal working relationship. This relationship should allow free exchange of information, especially in the areas of graduating science majors, and the MWR should make known to the university its personnel needs.

The dean of the College of Science was also very keen on establishing a summer work experience program with the ministry whereby, for example, several chemistry majors could assume positions in the laboratory during the summer months. This arrangement would benefit both parties: the ministry could initiate the students into the finer points of water chemistry and the students could gain valuable professional experience.

## Chapter 4

# TRAINING PLANS AND STRATEGIES FOR THE MINISTRY OF WATER RESOURCES

This chapter deals with the ideas, plans, and strategies developed by the consultant and training department staff for the training function of the Ministry of Water Resources. This is the second task in the scope of work under "training as a means toward strengthening the MWR's resources."

The first sections propose the training plan for 1991, and present approaches and strategies for training MWR personnel in 1991 and beyond. Later sections look at miscellaneous issues that will influence the training department and also present conclusions and recommendations.

### 4.1 Background and Context of the 1991 Training Plan

As the training department begins to plan and organize training events for 1991, it should be sure to step back and look at the human resource environment in which it is working. For example, the MWR lacks Omanis in technical positions; therefore, one guideline for the training department should be that training always will aim at preparing Omanis to assume those positions.

Training plans and priorities established by the department and Training Committee need to focus on helping the ministry achieve its goals; they also need to agree with its policies—what might be called the *technical environment*. The MWR's mandate, to manage Sultanate water resources, carries with it technical tasks. Thus, there should be constant monitoring of the training department's activities to see that they are in line with the ministry's technical direction, i.e., that staff are receiving the appropriate technical training for carrying out those tasks.

### 4.2 Proposed Training Approaches

To help organize its training plans and strategies, the training department is proposing three conceptual approaches to the training of MWR personnel. The first approach, to be used with executive personnel, is called the "garden" approach. This will entail planting the seeds of management concepts into the heads of the DGs, directors, and section heads. The second approach, known as the "cream-rises-to-the-top" approach, will be used for technical training. At each training level, those in this stream who exhibit motivation, potential, and interest will be allowed to go for further training. The third approach is for the support staff, and has been designated as the "sandwich" approach. The "bread" will consist of computer

and language training, and the various "fillings" between the slices of bread will vary according to the needs of the personnel: filling, administrative procedures, typing (word processing), accounting, budgeting, etc.

### **4.3 Training Strategies**

#### **4.3.1 Executive Track**

For the executive track, the first six months of 1991 will consist of a series of seminars, each treating a different management topic. Seminar themes might include planning, motivational leadership, communication skills, conducting performance reviews, etc. One seminar would occur in February, another in November. The most-appropriate training technique for these encounters will be the video. The management technique or theme of the video will be the stimulus for discussion among the group members. Facilitators for these groups might be found in Oman, or outside management instructors could be brought in for two weeks.

Possible candidates for off-shore training might be identified during this year, but the training department hopes to stimulate the curiosity of management-level employees in the MWR while at the same time conducting a needs assessment of the executive track members. This long (may seem excessively long) period for a needs assessment is justified, the training department believes, because the majority of training candidates will be directors and section heads.

For the most part, these employees are young and just starting on the career path. They will require gentle and thoughtful handling during this time. Although higher-level management training will not be useful to them, they do need to gain basic management skills and concepts necessary to lead their divisions and sections to successful task completion. Because the participants lack management experience and so many of the courses are based on participants' having some management experience, the MWR will need to carefully select the management courses they attend. It might even be advisable to hire a management consultant who could tailor courses to fit the needs of just such a group.

The directors general are special, since many of them have had years of experience working in the Omani civil service system. They too will need special attention and care; thus, the garden approach. Different management topics will be introduced to them during video sessions and then followed by discussion. Thus are the seeds planted. The training department will "fertilize" these ideas by circulating pamphlets about the types of training available locally and will from time to time "water" the ideas that are beginning to germinate by inviting outside speakers to come and talk about various management themes. This procedure is expected to stimulate the curiosity of this top-level group and help them think about the kinds of training they, as individuals, might like to attend. During the "germination" period, they should attend seminars and local short-courses (sample this kind of course at NICE, for example) and should also think about what kinds of off-shore training would be

appropriate. This is the budding stage. Full flower will occur when they return from longer-term training (wherever it might be) and become skillful and effective managers. (See Table 2.)

### **4.3.2 Technical Track**

The training department and the consultant believe that 1991 should be a year for the department to get its feet on the ground. It will be preoccupied with technician training, needs assessment, and managing the language and computer classes. Although the MWR wants to move forward quickly with its mandate, training priorities should definitely be set for the various groups and subject areas. The first priority for the ministry should be the training of technicians, both new and existing, as they will be needed to staff the new regional offices and carry out many of the basic inventory tasks.

The technical track will follow "the cream-rises-to-the-top" approach to training, as there is a need to "fast track" trainees in order to eventually meet the MWR's increased work load. In this track are four groups: new technicians, existing technicians, new graduates, and existing graduates. Eventually, there will be a fifth stream: the lab technicians.

#### ***New Technicians***

The new technicians (input #1), presently being trained at NICE, will finish their technical training (math, computer, English, and hydrology) and will go to the field for about six months. Then they should be brought together to receive "refresher" courses based on what needs their supervisors have discovered while the technicians were working in the field. This training would probably consist of courses in hydrology, math, computer, and language and should also allow them time to share thoughts and concerns, problems and ideas that have developed after working in the field. The department believes that the last part of the refresher training is very important and should carry as much weight as the technical training. This kind of interchange will help the trainees develop a group spirit, something necessary when working under such difficult and demanding conditions.

The second group of new technicians will start their first training in mid-January 1991 and will continue to the end of February. They also will need refresher courses during 1991; these should take place after they have completed their initial course and have worked in the field for about six months.

The third input of technicians will start training in May. Following the initial six-week course, the technicians will go into the field for OJT, which should last approximately six months. (The first refresher course for this group will not take place in 1991.) During this time in the

**Table 2**

**1991 Training Plan  
Executive Track**

Months		D.Gs.	Directors	Section Heads
<b>1990</b>				
November	(1)	*	*	*
December				
<b>1991</b>				
January	In-house management course			
February				
March	Outside guest lecturer			
April				
May	In-house management workshop			
June				
July	In-house			
August				
September	Off-shore courses begin			
October				
November	Outside guest lecturer on management topic			
December				

Notes: Look for management courses for summer, fall 1991

\* Meeting for executive level track participants to discuss management training strategies in MWR

(1) Hire MIS director

field under the guidance of the regional officer and senior technicians, the new technicians should work on the following:

### *General*

1. Continue with Arabic and English (2 hours/day).
2. Learn to drive.
3. Learn car maintenance and repair.
4. Learn safety awareness, desert survival, and first aid.

### *Hydrology*

1. Read and use maps and aerial photos for field location.
2. Derive UTM coordinates from maps.
3. Draw sketch maps.
4. Measure water levels and well depths.
5. Measure E.C., pH, and other parameters.
6. Measure voltage and resistance with multimeter.
7. Take water samples, label, and dispatch.
8. Measure falaj flow (current and float methods).
9. Record data and field conditions.
10. Service and maintain wadi gauges, rain gauges, ground water level recorders.

### *Office/Lab/Workshop*

1. Clean, check, and maintain equipment.
2. Inventory equipment and do stock control.
3. File and retrieve data.
4. Draw and plot by hand.

At the end of six months in the field, the technicians should return to the capital for refresher courses. Course content should be determined by how much they were able to progress in the field during their OJT and by the MWR's requirements. All technicians should participate, not having yet been "streamed" by the MWR into groundwater, surface water, or enforcement.

Several courses should be given no matter what has happened in the field:

1. Maths
2. Oman geography
3. Problem-solving skills (working on hypothetical cases)
4. English



5. Arabic
6. Written composition
7. Computer
8. Any technical course deemed appropriate
9. Basic communication skills

After completing these refresher courses, the technicians should return to the field offices and continue with OJT. During this period, many of them will be streamed and might begin to undertake specific experiences relevant to their streams. The following activities would be appropriate for this period of advanced field training:

#### *Field Operations*

1. Well inventory and field interviews
2. Levelling/basic surveying/slope area instruments (Amin suggests one month for surveying.)
3. Downhole salinity profiling and logging assistance
4. Surface geophysical survey assistance
5. Field mechanical and maintenance operation—welding, cutting, concreting

#### *Office/Lab/Workshop*

1. Data entering/processing on paper/computer files
2. Mapping—planimetry, contouring
3. Drawing/plotting/computing on computer
4. Technical report writing

#### *Specialized Field Duties*

1. Monitoring well drilling
2. Setting up and running pump tests
3. More downhole salinity profiling

#### **Existing Technicians**

The existing technicians, who have long been neglected in the area of skills enhancement, should be brought together in December of 1990 for a seminar on a particular topic (to be determined by the training department with the help of the regional people who know the technicians well).

Toward March or April of 1991, this group should receive cyclical training in maths. The plan here is to work with them for a week, give them assignments, and then check on them

In a few days to see how they are doing. The training department felt that a one-shot approach to this group, which had not received training for a long time, would be insufficient. Having an instructor go from region to region would be one way to accomplish this cyclical-training strategy, but the training department feels that from a motivational standpoint it would be wiser, although more expensive, to bring the technicians to Muscat for the course and for some team-building.

Later in 1991, some of the more-competent existing technicians could be part of a group going to Spokane for long-term training (or to the U.S. Geological Service [USGS]). (See Tables 3 and 4 for graduate and technician training schedules.)

### ***New Graduates***

February/March would be a good time to bring the new graduates together for a refresher course. This would be on a topic deemed appropriate for the group and could be done either by a visiting instructor or by someone from the technical side of the ministry. Several of this group are slated to go to USGS in June-August, and several will go for AA degrees in the United States. For those who do not go overseas (the vast majority), a second refresher course should be held in early fall of 1991 (Sept/Oct) on a theme the group considers relevant to its needs.

### ***Former Graduates***

Former graduates should also come to the February/March course. The training department sees two distinct advantages in bringing these groups together: academic and motivational. Building team spirit and motivation are accomplished in this type of setting. Former graduates will also be leaving the ministry to attend the USGS course and will be enrolled in long-term training overseas at Spokane, Sioux Falls, or Denver.

Specifics for overseas training are the following: In 1991, approximately seven ministry employees should be enrolled in the Associate Program at Spokane, Washington. This figure might include some technicians but will mostly be drawn from the group of graduates. Approximately three to five new graduates should be enrolled in the USGS course for the June 1991 session, and the ministry would like to enroll one graduate in the USGS course in Satellite Imagery beginning in September 1991. During this same year, the MWR proposes to enroll an unknown number of management staff in management courses; the University of Pittsburgh was mentioned as a possibility.

### ***Laboratory Technicians***

Concerning training for the lab technicians, the ministry needs to contact the OTIC immediately to prepare for training the technicians who will staff the new laboratory once

**Table 3**

**1991 Training Plan  
Technicians**

Months		New Technicians		Existing Technicians	
<u>1990</u>	Input #1 one finishes				
November				Refresher courses in field	Skill evaluation in the field by Amin
December					
<u>1991</u>	OJT for input # 1				
January		6 week course input #2		Begin search for T.O.T. candidates	
February					
March					Two-cycle math course
April	Refresher for input #1	OJT # 2			
May					
June	OJT for input # 1	6 Week course input # 3			Selected candidates for USG
July					
August					
September	Input # 1 ready for streaming	Refresher for #2	OJT for # 3		
October					Leave for Spokane and Sioux Falls
November					
December				T.O.T. course	

**Table 4**

**1991 Training Plan  
New and Former Graduates**

<b>Months</b>	<b>New Graduates</b>	<b>Former Graduates</b>
<b>1990</b>		
November		
December		
<b>1991</b>		
January		
February	Technical course	Technical course
March		
April		
May		
June		
July	USGS	USGS
August		
September	Refresher Course	Off-shore
October		Off-shore
November		
December		

it is built. Even before this facility is completed, technicians will be needed to process the influx of samples being sent to the existing laboratory for analysis. It is predicted that about 30 lab technicians will be needed when the well inventory is in full swing. Since the ministry has an opportunity to hire a lab director to manage the new facility at the inception stage, it should do so. If this is done, the new director will be able to plan for laboratory manpower needs and oversee the hiring of personnel. (See Appendix E for training strategy for lab technicians, also included in WASH Field Report No. 326 on laboratory upgrading, and see Table 5 for laboratory schedule.)

### **4.3.3 Support Track**

As with the technical staff, the needs of the support staff are relatively easy to identify. This group has specific tasks to perform and, in general, is not being asked to manage other employees. The approach here is the "sandwich" approach. The two overarching requirements common to everyone working in a supporting position are English/Arabic and computer skills. These two disciplines are the bread of the sandwich; the filling will vary according to individual needs and also the needs of the departments the support staff work in. Therefore, English and computer training will be ongoing throughout the year. These courses will be contracted out in order to save the training department's time and energy. Just managing this training effort will require more resources than the training department now has.

The training department will form skill-level groups cutting across departmental lines for computer and language training and will contract with local private institutions for conducting this training. Regarding the filling of the sandwich, the training department will look to IPA, NICE, OTIC, and Capital Institute for help with accounting, bookkeeping, filing, office procedure, and other specific types of training necessary for each department to come to grips with its mandate and work load.

Much of the first part of 1991 will be spent doing a needs assessment of specific skills needed throughout the MWR. The training department has begun work on a job analysis form and has received the undersecretary's approval to begin circulating the form. The data from this form will help the training department schedule computer and language courses. (See Table 6 for support staff training.) The support staff should be ready to accept the new database management system when it goes into service.

## **4.4 Training Trends Beyond 1991**

### **4.4.1 New Technicians**

The refresher course for the third group of hydrological technicians will take place in early 1991, approximately six months after their initial course. By this time, the MWR will begin

**Table 5**  
**1991 Training Plan**  
**Laboratory Technicians**

Months	Laboratory
<b>1990</b>	
November	
December	
<b>1991</b>	
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	OTIC laboratory training
November	
December	

\* Hire laboratory director

**Table 6**

**1991 Training Plan  
Support Staff**

<b>Months</b>	<b>Support Staff</b>		
	<b>Computer</b>	<b>Language</b>	<b>Other Subjects</b>
<b><u>1990</u></b>			
November			
December			
<b><u>1991</u></b>			
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

streaming the new technicians into three tracks: ground water, surface water, and enforcement. Technical courses in hydrology will still be held for the technicians; these courses will be of a general nature. On-the-job training will occur in the regions (hopefully under the auspices of the training department's OJT guidelines). Toward the end of 1992, the technicians should begin to take courses specific to their areas of work (ground and surface water and enforcement). In 1993, specific courses will continue for the technicians as will courses to upgrade computer and language skills. For certain exceptional technicians there may be the possibility of off-shore courses starting in the fall of 1993. Early in 1994, the MWR should think about enrolling certain technicians in the long-distance course in hydrology offered by the University of New South Wales, Australia. This plan would offer them the chance to study and receive credit while still working. Technical short-courses given by track would continue during 1994, and there is the possibility of using interactive videos and computer-assisted training for upgrading technician skills. This would essentially be the last year for upgrading language and computer skills, and for one or two exceptional technicians, the possibility of going off-shore for more training. In 1995, exceptional technicians would continue to be tapped for off-shore training with an eye toward enrolling some of them in management courses (start of a management track). There would also be the regular ongoing short-courses in technically specific areas.

#### **4.4.2 Existing Technicians**

Early 1992 should see the search for appropriate degree courses for the existing technicians. During that year, these employees should attend technical courses to begin consolidating their skill and knowledge levels. These courses will be given by outside specialists, by the MWR staff in-house, or by local institutions. For these courses, the MWR could bring small groups of technicians together in the capital, or specialists could go from region to region when it is difficult for the technicians to leave their places of work. In the fall of 1992, one or two might leave for overseas courses in hydrology (with an eye toward upgrading their technical knowledge); in 1993, more refresher courses. In the summer of 1993, the 1991 batch of "old" technicians will return from overseas, and a few will depart in the fall for off-shore courses. The 1994-95 scheduling should continue in the same way. The last group of old technicians should return from overseas in 1994.

#### **4.4.3 Former and New Graduates**

The graduates, both former and new, will be attending the technical refresher courses offered by visiting instructors and local specialists. In the fall of 1992, several graduates should depart for off-shore courses in the U.K. and U.S. The same for 1993. With this group, the emphasis needs to be upon achieving a balance between technical and management training.



#### **4.4.4 Laboratory Technicians**

If laboratory technicians begin training at OTIC in the fall of 1991, they will graduate in the fall of 1993. Those who do well should immediately be considered for further training both locally (possibly at Qaboos University) or overseas in the U.K. or U.S.

#### **4.4.5 Executives**

During 1992, DGs, directors, and section heads will be attending local workshops and seminars on various management topics, as well as in-house classes in management and hydrology taught by visiting specialists. By the fall of 1992, the MWR should have identified those executives who will go abroad for further management training, and those who left the MWR in the fall of 1991 will be returning to work. Executives should continue to take management courses both locally and overseas.

#### **4.4.6 Support Staff**

The support staff will continue to take English and Arabic lessons as necessary. The 1991 needs assessment will have identified specialized areas for support-staff training, which will continue until staff become familiar with procedures and systems. Table 7 demonstrates the 1992-95 training strategies.

### **4.5 Miscellaneous Training Issues**

#### **4.5.1 On-the-Job Training Strategy for the MWR**

On-the-job training plays, and will continue to play, an important role in the MWR's ongoing training strategy. In particular, OJT will be an integral part of the training design for the new technicians. As a training methodology, OJT has many advantages: opportunities for practical field experience, chances to develop close working relationships with existing staff, and the possibility of receiving immediate feedback on performance are among the more important benefits that can be derived from OJT. There are disadvantages, however, that need to be carefully considered: OJT takes a lot of time away from busy staff, improvement of skills and knowledge is difficult to track, staff often do not possess the required training expertise to adequately transfer skills and knowledge and rely instead on a "this-is-how-we-do-it" philosophy of training. Many institutions use OJT as a way to evade the formal training needs of their staffs, saying "Oh, we do OJT here." (The implication being that no other kind of training is needed because OJT is meeting those needs.) Since the MWR is going to use OJT as part of its strategy to train new technicians, the following ideas are offered for consideration as guidelines for conducting OJT in the MWR.

**Table 7**

**Beyond 1991: Training Strategies**

- New Technicians**
- 1992
    - Refresher course for input #3 (early 1991)
    - Streaming of technicians into surface, ground, and enforcement
    - Ongoing courses in hydrology, computer, and language
    - On-the-job training in the field
  - 1993
    - Start of specific courses for the three streams in late 1993
    - Specific technical courses for the three streams conducted by the MWR and outside specialists
    - Continuing training to upgrade computer and language skills
    - For exceptional technicians, possible off-shore courses in the fall of 1993
  - 1994
    - Technicians enrolled in long-distance study (New South Wales)
    - Technical short courses continue by "stream"
    - Possibility of interactive video and/or computer-assisted training
    - Fall: last group of exceptional technicians to go off-shore
    - Last year for language and computer skills
  - 1995
    - Ongoing technical courses
    - Start of management track for exceptional technicians
- Existing Technicians**
- 1992
    - Early 1992, search and preparation begin for off-shore training
    - Refresher courses in technical and language/computer
    - Technical courses begin to consolidate knowledge and skills of existing technicians
    - Fall of 1991, technicians leave for off-shore courses
  - 1993
    - Professional refresher courses (in-house and visiting instructors)
    - Summer, return of Spokane technicians
    - Fall, last group of technicians leaves for off-shore training
  - 1994
    - Continued refresher courses
  - 1995
    - Last group of technicians returns home from off-shore training
- Graduates**
- 1992
    - Graduates to attend technical seminars given by MWR and outside instructors
    - Fall, group leaves for off-shore courses (USGS, Spokane, etc.)
  - 1993
    - Last group of graduates leaves for off-shore
  - 1994
    - In-house courses
  - 1995
    - Fall, last group of graduates return to MWR from off-shore courses.
- Laboratory Technicians**
- 1992
    - Laboratory management works to improve staff skills with OJT
  - 1993
    - Summer, OTIC lab techs graduate
  - 1994
    - Technicians enrolled in long-distance study (New South Wales)
    - Technical short courses continue by "stream"
    - Possibility of interactive video and/or computer-assisted training
- Executives**
- 1992
    - Seminars by visiting lecturers
    - Workshops and seminars by local specialists (technical and managerial)
    - Management training off-shore for several
    - Summer, off-shore students from 1991 return home
  - 1993
    - Local courses
    - 1992 off-shore trainees return
  - 1994
    -
  - 1995
    - Tailored management and technical courses
- Support Staff**
- 1992
    -
  - 1995
    - Continual computer and language classes
    - Other courses as appropriate at local institutes

1. After formal training is complete, think through what it is that you want the new technicians to accomplish during OJT. Set up a list of objectives for each technician (which might vary from individual to individual) based on the skills list for technicians.
2. Develop a systematic way of tracking progress toward meeting the objectives. One way of doing this is to have the technicians themselves, in collaboration with their mentors, keep track of their progress. Trainees generally know when they have mastered a certain technique or are comfortable with a certain concept. Formal evaluation techniques such as practical and written tests might also be used.
3. Mentors, those who will conduct the OJT, need to be carefully chosen. If the OJT is to be conducted at the regional offices, the job will probably fall to the regional director and some of the senior technicians. Criteria for choosing the mentors might include patience, willingness to take on such responsibilities, adequate time to work with the technician, total competence in the skills that he/she is mentoring, and basic knowledge of training techniques. (See issue 6 under section 3.4.2 on proposed TOT course for established technicians.)
4. There needs to be a system for documenting who has reached which level. If the technicians are to move in and out of regional offices, there must be records that document what skills they have acquired, which skills they need to be working on, etc. Probably the best way to accomplish this is to give each technician an individual record to follow him from site to site, on which mentors make comments, record progress, etc. This will allow each subsequent OJT activity to be tailored to the technicians' actual needs.
5. A related activity for the training department would be to help the personnel department develop an MWR employee handbook and help conduct a new-employee orientation.
6. One activity proposed for the MWR that could be financed from external sources is the visiting-expert seminar. The MWR has already undertaken this kind of project and is familiar with what is involved. WASH might provide a mechanism for channeling funds to prospective candidates.
7. Employees should be rewarded for completing training courses. This provides motivation for personnel and validates the importance of training within the organization.
8. The use of interactive video for training is most appropriate for increasing knowledge but has little relevance for skill building; it is also very expensive to produce. The ministry should consider carefully the advantages and disadvantages of any kind of audiovisual training before investing.

9. Amid all the changes occurring at the MWR, including the large input of new personnel, the ministry might consider hiring an organizational development consultant to help it sort out issues, problems, and concerns.
10. An internal survey of MWR professionals should be conducted to determine who would be willing to offer workshops on a variety of relevant topics. The MWR would thus be reinforcing the concept of learning for all staff members, and the ministry would benefit as a whole.
11. A delegation from the MWR (at least one member from the training department) should plan to attend the World Conference on Water Resources Management to be held in Rabat, Morocco, May 1991. In order to stay abreast of technical and managerial issues in water resources management, attendance at international conferences should become part of the ministry's training and human resource development strategy. Conferences are also an excellent way to reward, and thus motivate, deserving personnel.

#### **4.6 Principal Recommendations**

The report contains many recommendations throughout, some in the form of proposed actions, others as broad suggested courses of action (for example, recommendations for the upcoming technicians' training). However, the consultant would like to further recommend that the training department—

1. Consolidate its role within the MWR by continuing to define its activities, staff roles and responsibilities, and systems and procedures, and make these known to the other departments.
2. In collaboration with the regional offices and the technical staff, work toward improving the next two technician training courses by carefully formulating course objectives based on the technicians' job descriptions.
3. Use the 1991 plan and the 1992-95 strategy as flexible guidelines for developing a coherent set of training activities that will accord with MWR policies and goals.
4. Guarantee the department's success by continuing its enthusiasm, spirit, and motivation.
5. Begin the search for qualified laboratory and computer technicians who might start advanced training in anticipation of manpower needs in those two areas.

## **Appendix A Persons Contacted**

### ***Ministry of Water Resources***

H.E. Khalfan bin Nassir al-Wahaibi, Minister

H.E. Ali bin Mohamed al-Jarwani, Undersecretary

H.H. Sayyid Barghash bin Ghalid al-Said, Director General of Technical Services

Mr. Saleh Issa al-Mazroi, Acting Director General, Water Resources Management

Mr. Ahmed Mohamed al-Wahaibi, Director General, Finance and Administration

Mr. Mustafa Abdul Khaliq Ghaffer, Director of Finance

Mr. Mohamed al-Mukheni, Director, Training Department

Mr. Darwish Ahmed Al-Balushi, Director of Administration

Mr. Ali Matar Salim al-Azizi, Director, Public Service

Mr. Geoff Wright, Director, Regional Affairs

Mr. John Kay, Deputy Director, Water Resources Management

Mr. Wayne Curry, Deputy Director, Surface Water Department

Dr. Remy de Jong, Head at Directorate of Water Resources

Mr. Mahmud Mohammed Abdulla al-Shammany, Director, Personnel Affairs

Mr. Haider Musa Khamis, Deputy Director of Finance

Mr. Don Davison, Special Projects

Mrs. Rebecca Ridley, Department of Public Awareness

Mr. Alan A. Rendell, Planning Department

Mr. G.C. Bhatnagar, Acting Chief, Seeb District Office

Mrs. Usha Bajpai, Administrator, Training Department  
Mr. Abdul Rahman, Accountant, Accounts Department  
Mr. Abdullah Salim Nasser, Salaries Section, Finance Department  
Mr. Massoud al-Omery, Clerk, Accounting  
Mr. Khalid Bin Omar al-Djall, Personnel Department  
Mr. Mohammed Badawy, Personnel Department  
Mr. Said al-Hatall, Graduate  
Mr. Mohamed Obaid Mohamed, Graduate  
Mr. Hamad Salim Rashid al-Belushi, Graduate  
Mr. Ismail al-Badi, Graduate  
Mr. Nassir Homaid Salem al-Hosni, Graduate  
Mr. Nasser Mahammed al-Ghilani, Graduate

***Other Ministries***

Ms. Shamsa Allamki, Director, Computer Department, Ministry of Agriculture and Fisheries  
Mr. Nasser Seif al-Riyami, Director of Meteorology, Civil Aviation  
Mr. Anees Moosa, Institute of Public Administration  
Mr. Khalid Hassan Hassoon, Principal, Oman Technical Industrial College

***Sultan Qaboos University***

Mr. Sven Jensen, Computer Center  
Mrs. Bilquis al-Khabor, Language Center

Mr. Vance Stevens, Language Center

Prof. G.S. Gamlen, Dean, College of Sciences

Profs. Anderson, O'Hara, Hanna, Abdulnour, Salama, College of Sciences

***Private Institutes***

Mr. Alan Barnett, Director of English Services, British Council

Mr. Steve Brent, Director, English Language Center, Salalah

Mr. Peter Lucantoni, Acting Director, Capital Institute

Mr. G.R. Sharma, Director of Studies, NICE

Mr. Amrit Chopra, Director, NICE

***Omani American Joint Commission***

Mr. Duncan Miller, American Representative

Mr. Murl Baker, Deputy Director

Mr. Anjab Shawami, Deputy Director

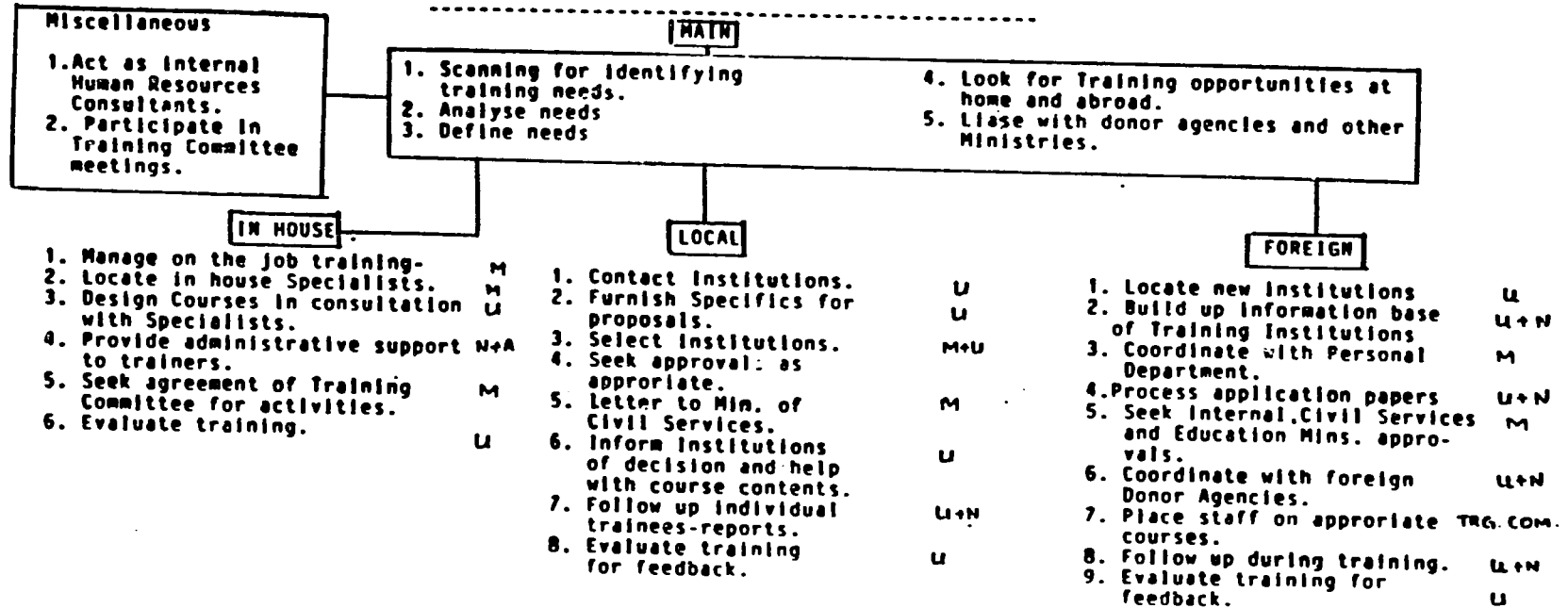
Mr. Mark Pickett, Training Officer

Mr. Roger Russell, Engineer

Mr. Musa al-Mazuri, Project Officer

## Appendix B

### Training Department Duties and Responsibilities



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#### PURELY ADMINISTRATIVE FUNCTIONS OF TRAINING DEPARTMENT

- |   |     |
|---|-----|
| 1. Maintain Records of individual staff and training courses.                     | N+A |
| 2. Maintain Information on training institutions.                                 | N+A |
| 3. Prepare annual budgets and keep record of expenditure.                         | M+U |
| 4. Send out letters of intent.  | M   |
| 5. Draw up contracts for Tailormade Courses.                                      | M+U |
| 6. Act as Secretary to the Training Committee.                                    | M   |
| 7. Inform all departments and district offices of forthcoming Training Programmes | N   |

KEY	
M	Mohammed
U	Usha
N	Nagla
A	Adnan
TRG.COM.	Training Committee



## **Appendix C Technician Training Course Proposal**

### **Course Content**

Technicians would follow a 180-hour course (5 days a week x 6 hours a day x 6 weeks). The 180 hours would be broken down as follows:

1. 80 hours of hydrology (20 of which would be taught by ministry personnel and 60 by the hydrological instructor)
2. 30 hours of Arabic
3. 30 hours of English
4. 30 hours of maths
5. 10 hours of computer (introduction only)

### **Entry Requirements**

Incoming technicians should be secondary school graduates (or equivalent), with competencies in Arabic, English, and mathematics. Driver's license desired. Good physical health is also requested.

### **Hydrology Curriculum**

The hydrology hours could be devoted to the following subjects:\*

1. Introduction to the course, administrative issues
2. Introduction to the MWR

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\*The topics listed here and on the following pages were included in an overview of hydrology done by the first technician course instructor. As per the recommendations, the MWR should decide if it wants the introductory course in hydrology to be an overview or to treat only several of the topics in depth. A proposal for a six-week course that treats essential hydrology topics follows.

In collaboration with several hydrologists, the consultant developed a proposed six-week course for training the hydrological technicians. This course could serve as an alternative to the overview of all hydrological subjects.

3. Hydrological cycle
4. Catchment area: topography, formations, shapes, flow patterns
5. Water balance equation
6. Rainfall, storm formation, rain gauges
7. Watershed rainfall network, basic raingauge, distribution of recording gauges
8. Rain gauge types, recording gauges, weighing type gauge, tipping bucket, digital precipitation, float type
9. Installations: general consideration, site selector, height of receiver, size of orifice, enclosures, windshields, factors affecting accuracy
10. Field measurements, general reporting procedures, inspections, special data collection
11. Data reduction: manual methods, annotating charts, tabulation, digital methods, tape, storage and handling
12. Data processing: isoheytal method, Thiessen method, arithmetic method
13. Test: storm studies, isoheytals, frequencies intensities, histograms
14. Run off: introduction. Flow measurement methods, direct, indirect, chemical dyes, whelmrod
15. Precalibrated devices for measuring flow weirs, flumes, and box culverts
16. Selection of gauging station sites, instrumentation, structures, benchmarks, reporting, station history
17. Measurement of flow: current meter, types, procedures, controls—artificial and natural
18. Current meter use: exercises of observed measurements, care of instrument
19. Stage recorders: types, purpose, installation, other stage indicators
20. Water-level recorder cross section, area rating curves, stage discharge relationship
21. Slope area survey: observer's responsibility, high flood marks, time of flood duration
22. Hydrographs, histograms, recorder charts analysis
23. Intensities, recording, analysis, tabulation, processing, rainfall data publications
24. Groundwater: geological introduction, mapping formations, units, water horizons, location trends
25. Geophysical investigations: seismic methods, electric resistivity, gravimeter, magnetometer
26. Groundwater investigations: installation, network drilling methods, well completion
27. Observations: water-level fluctuations, water-level measurement, pumping, overpumping, quality
28. Data reduction: processing, graphical representation, statistical representation
29. Surveying: introduction, instruments, distance measurements, horizontal, vertical, angles

30. **Test:** Use of survey instruments, cross sections, longitudinal sections, topography of the station
31. **Benchmarks,** reference points, baselines, cross section surveys, survey notebook, (only pencil used), notes, reduction, etc.
32. **Sedimentation,** site selection, sediment sources, sampling devices, suspended type, depth integrator, USDH 48, 49, 59 nozzles
33. **Bed load,** bed material, sampling frequency, sediment discharge measurements, field notes, etc.
34. **Water-quality variations,** springs, spring-flow measurements, biological and chemical effect, ground water
35. **Water quality:** lab procedure for analysis, conductivity bridge, drinking water norms, agricultural norms
36. **Sedimentation analysis and data reduction,** samples from reservoirs, lakes, etc.
37. **Soil conditions,** soil moisture, data collection and storage
38. **Mapping drainage areas,** hydrologic characteristics of watershed
39. **Runoff coefficients,** rainfall/rainfall relationship graph representations and average discharge cumulative runoff
40. **Planimeters for calculating areas of catchments:** practical training on the use and results
41. **Isohytal times on a water shed:** actual exercises, polygon
42. **Test—statistics in hydrology:** mean, max values, min values, upper quartile value, median, lower quartile value
43. **Statistics in hydrology (cont.)**
44. **Review**
45. **Review**

**Note:** Field visits have not been programmed into this timetable. Approximately five hours are left over, which is probably insufficient for allowing flexibility in the curriculum.

(The description of the follow-on training strategy for the technicians is found in Section 4.3.2.)

## Appendix D MWR's Human Resource Needs

MWR's plans for the next 5 years encompassing both the Recurrent & Development Budgets envisage a large expansion of total MWR personnel. The nature of MWR's work and the short duration of many Development Budget projects means that most of the employment created because of MWR's activities will be within the Civil Service under the Recurrent Budget. This is because the water resources investigations carried out under the Development Plan involves a relatively short-period of intensive activity (by consultants & specialist contractors) which yields reports, plans, recommendations for development, conservation & management but does not result in a permanent operation that requires staffing or which produces revenue.

The attached table summarises MWR's anticipated human resource needs over the next five years. MWR considers that it will be essential to obtain expatriate professional staff to take the more senior technical positions for a number of years, while the influx of newly-graduated Omanis are given an accelerated programme of on-the-job training, formal courses and are rotated within MWR Departments to maximise their range of experience quickly. Existing Omani professional staff are already being assigned with this in mind and are scheduled for early line-management responsibility of Technical Departments.

Omanisation will be accelerated and enhanced by this approach.

### Notes:

1. These preliminary assessments of Human Resource Needs are based on MWR's present responsibilities - if these expand then the number of personnel needed will increase. For example it is not presently envisaged that MWR will provide an extension service on Water Conservation & Water Management that reaches each individual farmer & water uses.
2. The National Water Resources Master Plan may recommend that MWR takes an additional responsibilities.
3. The estimates of staffing needs for new activities (inspection & enforcement) are necessarily approximate as MWR has just begun these programmes.
4. Total staffing needs presume certain activities will be executed by contractors.
5. The estimates do not consider MWR's administration & financial staff in the Directorate General of Admin. & Finance.

Academic Qualification: University Graduates

Grade - 2  
Group - 2

Academic Specialisations:

Predominantly from the following discipline:

- \* Hydrology & Water Resources Management
- \* Civil Engineering (Water Resources or Hydraulics specialisation)
- \* Water Resources Engineering
- \* Geology
- \* Engineering Geology
- \* Earth Science
- \* Environmental Science
- \* Hydrogeology
- \* Geography (Hydrology; Climatology or Geomorphology emphasis)
- \* Soil & Water Engineering
- \* Agricultural (Water emphasis)

Degree titles and course contents vary substantially - so this list is indicative only.

It should be noted that the list of predominant disciplines are largely interchangeable; water resources work encompasses the whole spectrum of specialisations.

In addition a few personnel in the following disciplines will be required:

- \* Analytical Chemistry
- \* Geochemistry
- \* Geophysics
- \* Computer Science
- \* Soil Physics
- \* Remote Sensing
- \* Land Resource Management
- \* Mechanical Engineering (hydraulic system)
- \* English (For Translator position)

Post-Graduate Qualifications

In the above subjects.

Most undergraduate degree programmes give limited attention to Water Resources and therefore most new graduates will require:

- \* Introductory training
  - \* on-the-job training
  - \* rotation to different departments for practical experience
  - \* Short courses
- and, for some, formal post-graduate studies.

Academic Qualification: Post Secondary  
 School Qualification - Grade -3  
 Group -2

Academic Specialisation

Predominantly in the following disciplines:

Water Resources Technology (overseas qualification)  
 Environmental Technology (overseas qualification)  
 Computing  
 Surveying  
 Engineering Technician  
 Laboratory Technician (Chemistry)  
 Technical Secretary

In addition a few personnel in the following disciplines will be needed:

Cartography  
 Electronics  
 Business Studies  
 Accountancy  
 Personnel/Administration

The anticipated needs per year for early level Omani personnel (3/2) are as follows:-

	1990	1991	1992	1993	1994	1995
Technician (Lab)		1	1	1		
Secretary	14	3	2			
Survey Assist.			2	2		
Cartographer		3	5	2		
Computer Clerk		6	5	2*		
Admin/ }						
Business/ }						
Personnel }						Not included
Accountant }						

\* Due to Omanisation.

**Academic Qualifications:** To be decided.

**Experience:** Preferably ex-ROP  
ex-Royal Army of Oman  
NCO's; Warrant Officers

**To be appointed as:** Well Permit Inspectors  
Water Use Inspectors

**Anticipated Needs:**

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	1990	1991	1992	1993	1994*	1995*
Sr. Inspectors	14					
Inspectors		10	17	30	10	10

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\* Anticipated needs based on:

- \* Turnover of staff
- \* Promotion to other positions
- \* Transfer to other technical duties

**Academic Qualifications:**      Secondary School (Science)  
V.T.I.

To be appointed as:      Technician at  
Grade-4    Group-2    OR  
Grade-5    Group-2

**Anticipated Needs:**

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	1990	1991	1992	1993	1994*	1995*
Technician	40	74	37	17	12	10
Assist. Technician	5					

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\* Needs allow for retirement of senior technicians, resignations; promotion to professional & managerial positions of existing technicians after suitable training & further education.



The anticipated needs per year of entry-level Omani Graduates (2/2 grade) are shown below:

1990**	1991**	1992**	1993**	1994*	1995*
27	35	38	28		
	1	16	30	30	20
27	36	54	58	30	20

\*\* These are entry level Omani Graduates to fill new vacancies.

\* These are entry-level Omani Graduates to fill vacancies created by:

- a) promotion of Omani staff
- b) replacement of non-Omani professional

**Academic Qualifications:**      Secondary School  
Typing Diploma

To be appointed as                  Typist  
Clerk  
File Clerk

**Anticipated Needs:**

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	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993*</u>	<u>1994*</u>	<u>1995*</u>
	5	41	13	12	10	10

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\* Numbers allow for some turnover of staff and some  
Omanisation of positions.

Also some Clerks & Typists will be promoted to  
Secretarial levels.

## **Appendix E**

### **Training Strategy for Laboratory\***

When the new laboratory opens in 1992, it must be ready with a full complement of qualified staff, some of whom will have to be expatriates on short-term contracts. The post of laboratory director should be filled as soon as possible to enable the appointee to participate in the design and planning of the laboratory and in selecting and training the staff. The MWR should arrange with the Oman Technical and Industrial College (OTIC) to train the laboratory technicians, who would start classes in the fall of 1991 and would be ready for employment in the summer of 1993. If technicians are needed earlier, the OTIC or the Sultan Qaboos University should be able to find qualified candidates. Based on the courses these students have had at school, a certain amount of on-the-job training will be necessary once they are hired.

The university is also very keen on having some of its chemistry majors participate in a summer cooperative program at the laboratory in much the same way as OTIC students presently do. This would involve not more than three or four students and could start in the summer of 1991. It would be an excellent opportunity to introduce chemistry majors to the laboratory and might motivate some to seek employment after they graduate. The university is prepared to take care of all logistics, including student housing and transportation to and from the laboratory.

For technicians who show promise, there are several schools in the United Kingdom that offer undergraduate, postgraduate, and refresher courses in laboratory procedures. Candidates should have had from six months' to a year's experience in the laboratory. Factory training in some of the more sophisticated analytical instrumentation, such as the GC/MS or ICAP, must be integrated into the training programs of both domestic and expatriate staff.

Once the laboratory is up and running, it can offer its own seminars, in-house lectures, and on-the-job training. Professional enrichment can come from attending courses at the university or abroad. Probably the most cost-effective way to train laboratory personnel is by having them rotate through all sections of the laboratory, learning as they go along about the different procedures in each section.

Field and regional office personnel should be technically qualified and adequately trained before they start work. They should be evaluated regularly for effective quality control of the

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\*This chapter appears in WASH Field Report No. 326, *Technical Assistance Program for the Ministry of Water Resources, Sultanate of Oman: Task 2A—Laboratory Upgrading* (draft).

data collected and also for identifying training opportunities to upgrade their skills. Those showing promise could be transferred to the central laboratory or selected to receive further academic training before such a transfer.

## **Appendix F**

### **Training Strategy for Data Management Systems\***

#### **4.1 Overview**

No information management system can function effectively without competent personnel to maintain and continually develop the system. Especially where computers are involved, it is imperative that personnel regularly upgrade their skills so as to keep in touch with the technology of this rapidly evolving field. Sections 4.2 and 4.3 respectively discuss the existing MWR computer training program and the needs of a program that will support a strong computer department. The Task 2B—Training report discusses MWR training needs in fuller detail. There must also be institutions and vendors who can provide ongoing hardware and software support. This network is well established in Oman and is discussed in Section 4.4.

#### **4.2 Existing Training Program**

At present, MWR employs two Omani data entry trainees, two database managers (one Omani, one expatriate), and an expatriate system manager. The training department is working to place Ministry personnel in appropriate data management training programs for the "typical users" group discussed in Section 4.3. MWR personnel have received little formal computer training.

#### **4.3 Requirements for Training of MWR Data Management Staff**

##### **4.3.1 Overview**

Data management staff may be classified into four groups for training: system manager, programmers/analysts/operators, advanced users, and typical users. The needs of each group are discussed separately below, but the following requirements apply to all:

- Computer training should be an ongoing process.
- There should be follow-up for all types of instruction.

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\*This chapter appears in WASH Field Report No. 325, *Technical Assistance Program for the Ministry of Water Resources, Sultanate of Oman: Task 1—Data Management* (draft).

- Training programs should be appropriately located.
- Training should be relevant to a staff member's role in the organization, both in terms of that person's abilities and interests, and in terms of the actual operations being taught.

### **4.3.2 System Manager**

The system manager is one of the most important users of the computer, ultimately responsible for operation of the entire system. The system manager must supervise a staff of programmers/analysts/operators, fully understand all the systems in use, and coordinate all computer-related activities within the organization. This person must have considerable management skills and training in computer system operation, such as a degree in management information systems. This person is the principal computer skills resource for the other computer department staff, as well as for the entire organization.

Training of the system manager can be divided into three phases: on-the-job training, additional institutional training, and ongoing education.

On-the-job training can be structured effectively if a contractor or staff advisor with advanced computer skills is working on-site to assist the Ministry in developing its computer systems. This phase might last one to two years, during which time the manager is trained to develop the computer system and train computer personnel.

Additional institutional training might take the form of a specialized educational program, such as an advanced degree at an overseas institution, that includes course work in system management, staff supervision, and staff training. The impact of the manager's absence can be minimized by arranging such a program while contract staff are still working.

Ongoing education is necessary to keep the organization in touch with technology and to continue to develop the manager's skills. Such training might include annual attendance at conferences in the manager's areas of interest, reading of literature pertinent to systems management, and regular contact with professional peers.

### **4.3.3 Computer Specialists**

#### **4.3.3.1 Programmers/Analysts/Operators/Administrators**

Programmers, analysts, operators, and administrators may work directly for the system manager or within other departments. They take on the daily tasks of operating the system and implementing ongoing system development. They may learn many of their skills on the job but must have the demonstrated skill level necessary for the position. On-the-job training by contract personnel can be very useful. There must also be ongoing training from the

system manager, from additional on-site instruction, and through external courses where such services are available.

#### **4.3.3.2 GIS Users**

Staff training is essential for implementation of a GIS and should begin as soon as possible. MWR could obtain some support from SCTP, which has a full-time GIS expert dedicated to GIS development in Oman.

Initial hardware setup and pilot studies could be completed by consultants with MWR counterparts. The consultant team would include at least one representative each from the software and the hardware vendors.

#### **4.3.4 Advanced Users**

Advanced users include professional staff throughout the organization who use computers to analyze data. They usually are skilled enough to use computers with a minimum of instruction, and training may consist of short in-house or off-site courses to familiarize them with a particular software package. These staff may also work with computer department personnel to develop applications peculiar to their needs. Where they are sufficiently knowledgeable, they may also instruct those working for them. They should be given the opportunity to become acquainted with the spectrum of available computer resources in the organization and should continue to advance their skills in their particular fields.

#### **4.3.5 Typical Users**

Typical users make up the bulk of users within the organization. These are the employees responsible for data entry, processing, and office routine, who use menu-driven systems and standard software packages (word processing, spreadsheets, etc.). Training of these personnel is already under consideration by the Ministry's training department and is discussed in depth in the Task 2B: Training report. Generally, these personnel should be given introductory computer usage courses as well as focused training, possibly off-site and also on-site, in the specific applications they will use.

### **4.4 Support**

#### **4.4.1 Training Services**

Computer training services are available in Oman through various hardware and software suppliers, and through computer training schools such as the National Institute of Computer

Education. These services cover a wide range, from instruction in software operation to provision of in-house trainers who help employees develop and maintain computer systems.

#### **4.4.2 Equipment Vendors**

Numerous computer hardware and software vendors have offices in Oman, primarily in the Capital area. These companies typically provide a full range of contract services, from system development to turnkey operations to maintenance. It is important to choose a reputable outfit and equipment that is reliable and backed by strong support.

#### **4.4.3 Contract Labor**

Data processing often has short-term demands for personnel. Although there are no agencies in Oman that provide temporary personnel, there are organizations that provide contract data-entry services.

#### **4.4.4 Interagency Cooperation**

As many government agencies have similar computer systems and MIS needs, interagency cooperation in training and support would be profitable. This might cover the provision of consulting services or the temporary assignment of personnel. Limited consulting services are currently provided by the computer department of the Ministry of Commerce and Industry (Section 2.6.2).