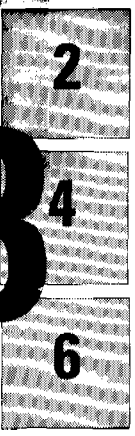
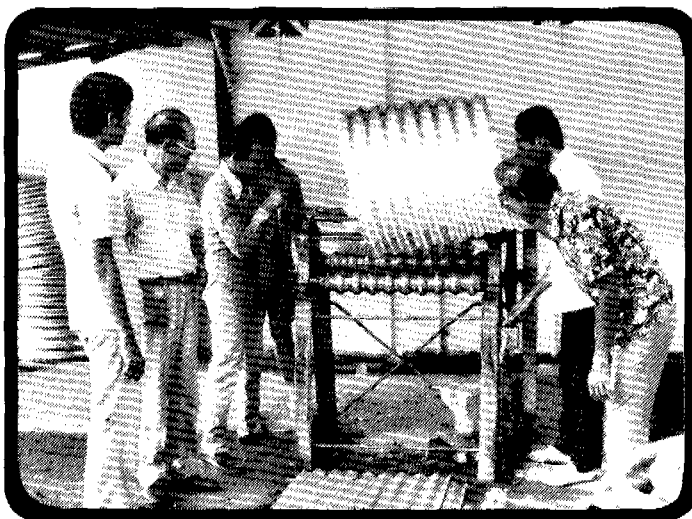


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REPORT ON IDWSSD ACTIVITIES IN HUMAN RESOURCES DEVELOPMENT



**INTERNATIONAL
DRINKING
WATER SUPPLY
AND SANITATION
DECADE**



1981-1990

**STEERING COMMITTEE FOR
COOPERATIVE ACTION**

JULY 1990

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INTERNATIONAL DRINKING WATER SUPPLY AND SANITATION DECADE

STEERING COMMITTEE FOR COOPERATIVE ACTION

REPORT ON IDWSSD ACTIVITIES IN HUMAN RESOURCES DEVELOPMENT

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Critical component

1. The Mar Del Plata Action Plan

The United Nations Water Conference considered Human Resources Development to be a critically important component of the Action Plan for the International Drinking Water Supply and Sanitation Decade (IDWSSD). Clauses from the Mar del Plata Action Plan quoted in the box below called for recognition of the need for skilled manpower at all levels. Needs were evident for staff capable of planning, implementing, operating and maintaining water supply and sanitation systems of various types.

While acknowledging that increasing the numbers of skilled personnel at the national level was a priority objective, the conference placed emphasis too on the importance of intercountry cooperation in the development of training facilities and programmes. It also stressed the need for countries to assess the national supply of and demand for skilled manpower and to use the results of such an assessment in planning manpower development.

Clauses from the Mar del Plata Action Plan

A. Priority areas for action

2. Action must be taken to remedy constraints of manpower shortage (especially at the intermediate and lower levels), and inadequacies in institutions and organization.

B. Recommendations for action at the national level.

- 5(c) Assess the manpower situation and, on the basis of this assessment, establish training programmes at the national level to meet the immediate and future demand for additional professional staff, intermediate level technicians and, most important, village level technicians.

C. Recommendations for action through international cooperation

7. The international community should give high priority to collaborating with governments with regard to manpower surveys, the establishment of national training programmes (to meet immediate and future needs for professional staff, intermediate level technicians and village technicians), research and the promotion of community participation.
9. Developing countries should foster cooperation among themselves, *inter alia*, in the establishment of inter-country training facilities, in the development of appropriate technologies and of methodologies for training and management, and in the exchange of experts and information, so that experience available elsewhere can be adapted to local conditions.



2. The international community responds

HRD Task Force

The Steering Committee for Cooperative Action in the IDWSSD was established with the primary objective of coordinating the various inputs to the Decade. Task Forces were established in several technical areas, including a Task Force on Human Resources Development, which was comprised of representatives from many agencies, international, bilateral and nongovernmental. To facilitate working arrangements and to ensure continuity of participation by key agencies, a Core Group on HRD was established with representatives from the World Health Organization (WHO), the International Labour Office (ILO), the United States Agency for International Development (USAID), the Pan American Health Organization (PAHO) and the World Bank.

WHO documents

As the informal secretariat for this Core Group, WHO prepared the *Basic Strategy Document for Human Resources Development* which, after clearance by the Task Force on HRD, was approved and adopted by the Steering Committee. The Basic Strategy Document served as an outline guide to Decade strategies and approaches for national and international agencies alike. The Basic Strategy Document stated that guidelines would be prepared in order to “provide a general framework and measure of uniformity” in approaches to HRD.

The *Human Resources Development Handbook* was prepared by WHO to fulfil the need for a working document that could guide national agencies in the task of improving employee and agency performance. The HRD Handbook stressed that three steps - Planning, Training, and Management - are essential for well-balanced development. This led to the subsequent preparation of a guideline document, *The Dual-Focus Approach*, which emphasized the probable need for agencies to revise policies and procedures in order to maximize the benefits of new and improved skills in the labour force. WHO also managed the preparation of twelve case studies in Human Resources Development, which are intended for use as learning materials in workshop settings but are also useful in individual learning situations.

International network

The United Nations Development Programme (UNDP) and the World Bank collaborated to produce a programme that was initially directed towards technological research and development with the objective of popularizing simple and inexpensive technologies. The programme was subsequently expanded to include the preparation of a series of visual aids (modules) on many aspects of design, construction, management and operation of water and sanitation facilities. A “network” has been established (the International Training Network or ITN) of training centres which also act as repositories for the series of visual aids.



ESA support

Many support agencies developed approaches to assist countries in the development of their human resources. USAID, through its Water and Sanitation for Health (**WASH**) project, devoted more than 25% of its assistance to HRD in conjunction with institutional development. This assistance took the form of assessments and technical assistance as well as the preparation of generic documents such as guidelines and training manuals.

The Swedish International Development Agency (**SIDA**) provided staff and other resources to assist WHO with its HRD programme at country, regional and central levels. Similar support was provided by the Norwegian Agency for Development (**NORAD**) for the development of job guides. These are descriptive, "how-to-do-it" manuals which give detailed, well-illustrated guidance to field workers on operation and maintenance tasks.

Substantial assistance was provided by the Danish International Development Agency (**DANIDA**) for training personnel in water quality analysis and control.

3. Achievements of developing countries during the Decade

New attitudes

Probably the most significant advance during the Decade has been the change in attitude of many countries towards human resources development, which was once considered to consist only of formal education and training. Now it is increasingly recognized that HRD includes the employment of people, their supervision, improved performance, continuing education and occupational welfare. Attention to conditions in the workplace is therefore essential, and this requires full consideration of the interrelationships of planning, training and management.

The extent to which attitudes concerning HRD have changed in the water supply and sanitation industries can be seen in the findings of a recent WHO study. Of the national agencies that provided information for the study, more than two-thirds have training policies and 60% have prepared manpower development plans. Half of the agencies that reported have allocated funds for the specific use of HRD activities, while others depend on ad hoc allocations.

Previously, water supply and sanitation agencies depended on universities and vocational institutes to train technical staff. Such training invariably concentrated on theoretical aspects. Practical "hands-on" training was largely neglected. The current trend towards on-the-job training and specialized job-oriented courses will contribute to improved efficiency in the water supply and sanitation industry.



***WHO study on
human resources
development***

During 1989 the World Health Organization undertook a worldwide study of human resources development in the context of the IDWSSD. Two types of assessment form were distributed to collect information. One form was designed for use by external support agencies (ESAs) and was sent to international organizations, bilateral agencies, regional banks, selected nongovernmental organizations and other organizations known to have programmes in water supply and/or sanitation.

The second form, designed to obtain information from the water supply and sanitation agencies in WHO Member States, was sent through WHO Regional Offices and Country Representatives to the national agencies concerned. In addition to supplying hard information concerning human resources development in the agencies, respondents were asked to identify the problems that appear to constrain progress in the sector.

***External support
agencies***

The assessment form that was sent to ESAs began with a question concerning the Basic Strategy Document for Human Resources Development. The strategy had been endorsed by the IDWSSD Steering Committee and distributed to ESAs early in the Decade. It is based on a three-component process - Planning : Training : Management. Several critical elements were described within each component and ESAs were asked to "score", on a scale of 1 to 5, the extent to which they were able to act on each element.

Eleven respondents completed that part of the assessment form relating to the Planning - Training - Management process. Their reports indicate that actions on the various elements that make up the Training component have received considerable attention. The overall average score for the eight Training elements is 4 out of a possible 5. Greatest successes are apparent in *development of facilities and support, preparation of training aids and evaluation of learning*. The least successful elements are *needs analysis for training and development of multi-disciplinary teams of instructors*.

Substantial success has also been achieved in the various elements of Management, with an overall average score of 3.4 out of the possible 5. The greatest impact here has been on *preparation of performance-oriented job descriptions and development of training policies*. Least progress has been made in *rationalizing the structure of organizations* and in *evaluating the beneficial effects of training on an organization's efficiency*.

Planning of HRD interventions appears to be the area where ESAs have had the least influence. This suggests that the training that is considered to have been successful has been relatively unplanned and not necessarily oriented to the needs of the organization. The element for which the



lowest scores are reported concerns *appraisal of the organizations' ability to pay skilled and qualified staff*. Other elements in which weaknesses are apparent include *estimation of manpower needs, determination of the level of service to be provided and identification of training resources available in-house*.

Almost all ESAs consider the Basic Strategy to be a valid approach to HRD. One agency makes the case that basic education is an essential prerequisite to effective and efficient training – an argument that will find little opposition. Greater emphasis is reportedly necessary on linkages between the water sector and other economic activities, otherwise each agency will plan its next steps autonomously, on the basis of perceived priorities and available resources. The general consensus apparent from the comments provided is stated most succinctly by one of the large bilaterals: “It (the basic strategy) has proved to be quite helpful in providing an overall framework”.

***INSTRAW's
unique role***

The INSTRAW mandate to focus on women in development gives that agency a unique role. The approaches used in its training programmes combine the traditional with the innovative. Promotion of awareness, creation of expertise, and orientation of policy and legislative action on women and development at all levels are major objectives.

***Range of
investments***

Human resources development programmes are said to require tailoring to the specific needs of the country in question. This, combined with the different mandates of different agencies, accounts for the wide range of investment made in HRD. Agencies whose mandate is to support education and training report that between 25% and 50% of their budget is spent on such programmes. Others, whose support includes the provision of capital equipment and the development of physical infrastructure, report lower percentages - from as little as 1% to 20%. Several comment on the problem of providing a reliable figure since so much depends on the situation in individual countries, budgetary constraints and, sadly, political considerations.

Some form of evaluation is practised by all of the ESAs. In descending order of preference, the commonest methods are field missions, desk studies and on-the-job evaluation. Cost-benefit appraisal is also used but usually in combination with other evaluation methods. Follow-up on the career development of trainees and post-project reappraisal are mentioned as techniques used by two large agencies. Most respondents mention the use of two or more evaluation methods, but it is not clear whether these are both applied to each project or used separately for different projects.

Most of the ESAs consider that they have been successful in overcoming some of the problems that have constrained progress in the past. However,



Difficult problems

there are no signs of complacency: all agencies recognize that many problems remain. One particular problem that many agencies have partially resolved is the failure of training and education institutes to orient their curricula towards the needs of the sector. Progress has also been made on promoting the development of coherent HRD policies that incorporate the Planning - Training - Management process.



A young Brazilian water management trainee checks a rain gauge. From the early 1970s, Brazil's training programme has sought to use human resources in the most appropriate and productive ways.
WHO photo by L. Solmssen.

Problems that appear to be difficult to overcome include:

- shortage of managerial and supervisory skills at all levels;
- inefficient deployment and utilization of available human resources;
- the bias of managerial, professional and technical thinking towards the urban situation;
- resistance to change among many of the decision makers and managers;
- irrelevance of training curricula to real job needs including improvements in employee performance;
- weak infrastructure for basic and technical training;
- the apparent inability of women to reach senior and management levels in most organizations;
- managerial insensitivity to problems that are particular to women.

Many problems are peculiar to specific countries and sometimes to specific agencies within a country. However, an underlying and almost ubiquitous problem is poor-quality work and low productivity, aggravated by a failure to recognize this. Moreover, management has difficulty in developing policies and procedures that would alleviate these problems and in generating agency pride in providing high-quality services to consumers.

National agencies

Data have been provided by 108 agencies or departments in 58 countries. Of these, 25 deal with water supply only and 13 with sanitation only; 67 have responsibilities for both water supply and sanitation while three are co-ordinating bodies. Collectively, these agencies provide services to



13% women

more than 500 million people in countries whose populations total more than 1000 million (UN 1985 estimates).

National agencies report employing 262 000 staff, of whom slightly more than 13% are women. The percentage of women employees is highest in the Philippines (35%), Poland (26%) and Indonesia (25%). Countries in the Americas that provided information employ an average of 13% women in water supply and sanitation; the range is from 5% to 24%. In the Eastern Mediterranean Region the range is from <1% (Pakistan) to >10% (Egypt), whereas in the African Region women make up 6% of the workforce. Programmes in Gambia, Cameroon and Benin report few or no women employees, while the sanitation programmes in Mali and Guinea both have approximately 25% women workers.

12% over 50

As a global average, less than 12% of the workforce is aged over 50 years. In some countries, however, there is wide variation from this figure. Youth predominates throughout Africa, with an average of only 3% of employees aged 50 or more in the 31 agencies reporting. Agencies in Benin and Malawi, however, report that more than half of their staff are in the over-50 age group. Several other African countries, by contrast, have no workers over 50, and this may reflect the demand for skilled people in other sectors as well as a general shortage of technical skills among older members of the population.

Half of the countries in the Americas report older workforces with between 17% and 64% over 50 years of age. Staff in the countries of South-East Asia and the Western Pacific Regions are generally younger than the global average, with the notable exception of employees in Myanmar (Burma) where 1971 (29%) of the 6797 employees are older than fifty. These data have obvious implications for training needs; where the work force is relatively old there will shortly be an urgent need for substantial numbers of newly trained and younger staff.



Practical training in the field on handpump maintenance.
WHO/WPRO photo.

Questions concerning the number of personnel in management, professional, technical and skilled jobs produced a wide variety of responses. There are some extremes that stretch credibility; for example, 21% of staff in one agency are apparently classed as managers, but there are no skilled or unskilled workers. Leaving aside these and other unlikely responses, it



4-6% management

appears that management accounts for 4-6% of the workforce. No pattern for other levels of employee can be discerned from the responses. It seems likely that the term "professional and technical staff" is interpreted differently in different agencies and that it will be necessary to provide precise definitions for the various categories of employee if meaningful and comparable data are to be obtained from future human resource assessments .

The workforce in water supply and sanitation appears to be reasonably permanent and stable. One country in the American Region, however, reports that it is difficult to recruit and retain high-level executives for management positions. This it attributes to the problem of arranging salary increases that will keep pace with a high rate of inflation. Globally, more than 90% of the total number of employees are classed as permanent; approximately 5% are casual employees and 5% are employed by contractors working for an agency. Turnover appears to be minimal; only 2.8% of the total number of employees left agency employment during the reporting year while 6.6% of the employees were newly recruited during the same period.

5.4% vacancies

Although this represents a net increase during the year, a substantial number of vacancies remain. Overall there is a 10% average vacancy figure for all agencies reporting, but when the large number of vacancies (33%) reported by two European countries is removed, the figure for the remaining countries drops to 5.4%. The situation is most serious in Africa, where the 31 reporting agencies have vacancies for 3426 staff (17% of their permanent workforce). Elsewhere, vacancies are practically negligible, with less than 4% in the American, Eastern Mediterranean, South-East Asian and Western Pacific Regions.

Even where vacancies are few, they are undoubtedly important in terms of the qualifications required in the positions concerned. Occupations for which the greatest recruitment problems are reported and the number of times they are mentioned are as follows:

skilled/qualified/experienced workers	34
technicians	30
engineers	20
other professionals	17
managers	7
accountants/bookkeepers	3
stock keeper	1

It is interesting to note that in those regions where there is the least reported need for professional staff there is the greatest recognition of the need for skilled and experienced workers.



Training budgets

Half of the agencies report that they make budgetary provision for training activities. Of total budgets, the proportions allocated for training generally range from a low of 0.002% to a high of 5%. Eight agencies, however, report training budgets of between 7% and 18% of the totals. In one of these agencies, a major role is the provision of support, including training services, to locally operated waterworks throughout the country. Development programmes in two of the other agencies with high training budgets are known to have been influenced by an external aid project that contained a large training component.

Several agencies indicate that funds for training are not specifically earmarked in their budgets, and 19 indicate that training receives no financial support. Others state that training is the responsibility of other government departments.

National agencies were asked whether they had manpower development plans and training policies and whether their training programmes were subject to evaluations. Questions were also asked about the number of employees in various job categories who were given training, either on-the-job, off-the-job or both. The responses to those questions are summarized in Table I below. This provides some indication of whether training is structured to meet the agencies' needs or is provided in an *ad-hoc* manner.

Structured training

<u>Item</u>	<u>Response</u>
Does the agency have a budget for training?	YES 54
Does the agency have a manpower development plan?	YES 67
Does the agency have a training policy?	YES 74
Does the agency evaluate the results of training?	YES 53
Does the agency provide on-the-job training?	YES 56
Does the agency provide off-the-job training?	YES 55
Does the agency provide a combination of on-the-job and off-the-job training?	YES 12

An opinion survey that formed part of the WHO study listed 18 HRD issues that had been identified in earlier studies. These issues were contained in the assessment form. Agencies were asked to review this list, to select the five issues that they consider require high priority attention and to arrange them in descending order of importance.



Opinion Survey

When the results of this opinion survey were analysed, consideration was given to the frequency with which particular issues were chosen and the degree of importance that respondents attached to the chosen issues. The analysis revealed that greatest importance was attached to the issue of:

“Conditions of service - e.g. pay, working hours, vacations, fringe benefits - are unattractive as compared with other sectors.”

Another issue was selected almost as frequently but scored significantly lower:

“There is a shortage of skilled workers for the water and sanitation sectors compared with other sectors.”

The third-place and fourth-place issues were tied for selection frequency and had only slightly different scores for importance. These were:

“In many job categories there are few - or no - opportunities for advancement or career development.”

“The workforce in the agency has most of its experience in the design and construction of new systems; there is a need to develop a cadre of staff with interest and skill in operation, maintenance and upgrading of existing systems.”

These four issues were quite closely grouped by both frequency and score; there is then a substantial gap in the scoring sequence before the fifth-place issue after which the scores decrease rapidly.

Supplementary issues of concern

Several agencies presented HRD issues to supplement the original list of eighteen provided in the assessment form and usually gave them a first priority ranking. When a second supplementary issue was presented it was given a ranking of second, third or fourth. Some of the supplementary issues that were presented are:

- The interrelationship of HRD and organization development is not clear and is not fully appreciated.
- Many personnel managers do not have an adequate understanding of the techniques for recruitment, selection, evaluation and administration of human resources.
- Political interference in the implementation of legislation establishing the organization has caused manpower difficulties due to insecurity and low appreciation of services provided compared with other public utilities.
- “User pays” and “full cost recovery” policies generate revenues that are taken as general revenues by local government, thus denying access

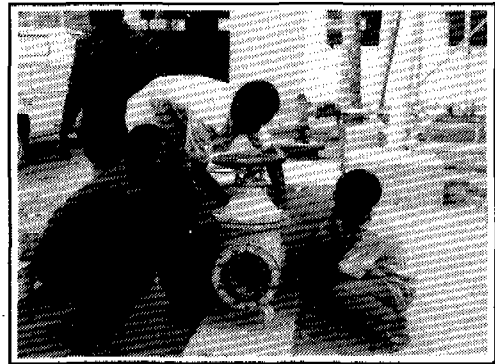


*Need for
improvement*

by the agency to funds necessary to recruit, train and retain staff.

- Some agreements between the agency and the labour unions hinder the personnel development.
- The section of the agency responsible for the training programme is separate from the personnel department.

The findings of this opinion survey strongly suggest that, although progress has been made in human resources development, there is a continuing need for improvement. There will always be a need for programmes of staff training and agencies will find it necessary to modify their policies and procedures as coverage, levels of service and population served increases. Changes will also be needed as new technologies are introduced and as the trend towards full cost recovery becomes more fully established. Thus, human resources development will require attention after the IDWSSD.



Hands-on training is the most useful way to acquire skills quickly.

4. Country examples

Some examples of specific country activities for the improvement of human resources development are contained in the following summaries.

Philippines

The Local Water Utilities Administration (LWUA) provides support to more than 350 water districts throughout the country. One of the support responsibilities is human resources development, with emphasis on training in key areas of operation and maintenance. It was found that management was inadequate in many of the water districts and that weaknesses were not being remedied by training alone. Analysis of the problems indicated a lack of management experience to be the principal problem, and suggested that provision of an advisory service to district managers would help to compensate for this deficiency.

An advisory service has been organized and staffed with 36 experienced managers, most of whom have a background in engineering and/or business administration, with several years' experience in supervisory positions. In order that evaluations of a water district's performance are as objective as possible, the advisers use a set of standardized development indicators.



Operating information is routinely recorded on monthly data sheets. Thus, periodic checks of performance are now possible, weaknesses can be detected and management solutions can be devised to improve performance. These solutions are presented on a "Recommendation Form", together with the necessary follow-up steps, and the completed form is signed by both the adviser and the district manager.

Each of the water utilities in the Philippines has its own board of directors, as well as a manager and substantial autonomy. They are intended to be financially self-sufficient and do not normally receive grants from central government. Efficiency is therefore important - not only in production and distribution but also in billing consumers and collecting payments. The system operated by the management advisory service assists and coaches both managers and directors. Newly established water districts have been found to need advisory services for about 4 years, until sufficient experience has been accumulated.

Indonesia

Indonesia's Organization-Management-Training (OMT) Project, which operates in 11 cities, has been a milestone in the country's water supply development. Designed and implemented during the period 1982-85, it linked institutional and manpower development to water project implementation for the first time.

While new water supply systems were installed, existing and potential employees were trained to meet the requirements of administrative reorganization and new routines. Staff training needs were analysed on the basis of job descriptions and data collected in the field. These job descriptions were essential in preparing the training package.

The impact of the OMT approach can now be detected nationwide. A standard training programme has been developed for the whole of Indonesia, based on the project's training curricula and materials. Training manuals have been compiled, so that training can take place anywhere with a minimum of advance planning.

Substantial amounts of money have been saved, first by reducing planning and preparation time, and second by replacing consultants with regional trainers. Using the standard training package, the national water supply agency estimates that the cost of training one manager or operator on a two week course amounts to just US\$ 250 (400 000 rupiah), excluding any travel costs.

The resulting water enterprises in the eleven cities vary in their effectiveness. Some are working well while others are experiencing a high turnover of staff. The training is so highly regarded that other industries



have been prompted to offer higher salaries and attract personnel away from the water enterprises. The approach used by the OMT Project has been applied all over Indonesia and stands as an encouraging example of demonstration projects.

United Republic of Tanzania

For 10 years from 1974 onwards, the Water Resources Institute (WRI) in Dar es Salaam trained middle-level technicians and skilled workers for employment in the Ministry of Water. It taught theory that was not particularly relevant to the water sector's needs, and employers frequently complained about the poor abilities of graduates in practical field work.

Several evaluations revealed that the teaching did not give students the skills and knowledge required to carry out their tasks as technicians. The WRI staff themselves recognized the need to correct the situation but, in the absence of specific information about the tasks and duties of technicians, the problem remained unsolved.

By 1984 it had become obvious that change was essential. A decision was taken to develop new curricula; teachers were to write the modules themselves and take full responsibility for this revision work. A consultant was enlisted, but only to assist the teachers in this process - not to do the actual work. The revision began with a field survey of the tasks of each grade of water technician. What exactly are a technician's tasks? What do technicians need to know and be able to do? What tools do they use? Only with answers to these questions could the teachers plan their new courses.

More than 100 technicians were interviewed and observed in their field work. Tasks and duties were clearly detailed so that job descriptions could be written, on the basis of which the revised curricula could be closely linked to Tanzania's needs. The new modules were then reviewed by technicians and other professionals in the water supply industry.

It took four years to devise a new profile for technical training at the Water Resources Institute. Today the curricula are task oriented rather than academic, which has strengthened the teachers' positions in their work. Their studies leading to the preparation of the new curricula have given them a much better understanding of the relationships between what needs to be taught at the WRI and the work that has to be done in the field.

Trial implementation, which began in July 1988, has shown that the modules are well formulated and need only minor modifications. Teachers now feel a much greater need to define exactly why they are teaching certain topics and to learn more about practical courses and exercises.



Regular review seminars are held at the WRI and these ensure a consistent analysis of progress.

Parana, Brazil

The state water and sanitation agency in Parana, SANEPAR, expanded rapidly during the 1970s. Staff numbers increased from 68 to 3500, mainly in the technical areas of design, construction and operation. However, major problems in billing consumers and collecting payments led to serious debt, and operation and maintenance problems were the cause of numerous complaints from customers. Significant dissatisfaction among employees stemmed from lack of management and poor career prospects.

These problems were identified in 1979 by a newly appointed president of SANEPAR who selected a management team and charged it with resolving the problems. After a thorough analysis, the team developed a strategy that focused on people. Its objective was to improve the organization's image by improving the quality of service to customers. This required that many outdated or inefficient procedures be revised and that staff be trained or retrained for the new procedures.

Specific courses were designed to meet the needs of individuals and the tasks to be performed. A general training programme was also instituted, which included basic courses in management, communications, computers and certain technical subjects. In preparing the training programme, SANEPAR's training department considered teaching techniques, teaching modules, manuals, self-learning materials, case studies, group activities and the time and resources required for each element of the programme. Entrance tests were conducted to ensure that trainees were adequately prepared for training, and equally important, intermediate and final tests - often of a practical nature - were designed to ensure the effectiveness of training.

Management of SANEPAR has been decentralized in accordance with a strategy whereby decisions are taken at the lowest possible level. This avoids the wastage of time associated with "buck-passing" and encourages staff to accept responsibility and take initiatives. In support of this process there is now a career development plan designed to raise the motivation of workers by rewarding them for superior performance.

This document is one of a series of booklets prepared on behalf of the Steering Committee for Cooperative Action for the International Drinking Water Supply and Sanitation Decade. Titles in the series are:

- 1. Report on IDWSSD impact on Diarrheal Disease**
- 2. The IDWSSD and Women's Involvement**
- 3. Human Resources Development in the IDWSSD**
- 4. IDWSSD activities in Technical Information Exchange**
- 5. Report on IDWSSD impact on Dracunculiasis**
- 6. Report on IDWSSD impact on Schistosomiasis**

Copies of the documents are available from the CWS Unit, World Health Organization, 1211 Geneva 27, Switzerland.