



No. 160 June 2000

Nigeria : Innovative Training for the improved delivery of water

The primary objectives of the World Bank-assisted six-year Nigeria National Water Rehabilitation Project (NWRP) are a reliable supply of good quality water, and increased revenue for the country's state water agencies. Nearly 250 urban water systems are being restored to original design capacity.

Prior to the start of the project in 1992, many water meters had quit working, valves controlling pipe networks were often faulty, treatment of water was uneven, leaks were often not adequately located and repaired, a number of pumps were not pumping, boreholes were silting up or becoming polluted. All of these deficiencies added up to water systems delivering below design capacity, which in turn resulted in unreliable delivery of water to customers, and revenue often inadequate to enable water agencies to meet basic operational needs, including maintenance of physical assets.

The NWRP has effectively changed this situation through an innovative outreach training strategy, an intrinsic part of the institution building and training component which accounted for \$ 13 million out of the total project cost of \$ 306 million.

Challenges

There were two challenges for capacity-building. The first was to efficiently provide demand-driven practical skills training to the thousands of men and women who, every day, are relied upon to maintain diesel generators, pumps and water meters, keep distribution valves functioning, find and repair leaks, service and protect boreholes, and treat water to ensure quality. A survey revealed that virtually none of these men and women - usually referred to as "operatives" - had ever undertaken systematic training. The second challenge was to ensure that capacity-building activities contributed to increased autonomy of the state water agencies through increased revenue generation – mainly by ensuring that more water reached, and was paid for by the water agencies' customers.

Enabling arrangements

The first step of the capacity-building program was the formation of a "Manpower and Training Committee"(MTC) comprised of the National Water Resources Institute (NWRI-the primary source of water services personnel training within Nigeria), the management office of the National Water Rehabilitation Project, and representatives of the thirty-six state water agencies. Once formed, the Committee was charged by the Ministry of Water Resources with designing a staff development strategy.

Two early actions by the Committee set the stage for design of this strategy. Firstly, the functions of the various water service offices — the Ministry, the NWRI, the Project Office, and the state water agencies

themselves — were agreed upon, as was the relationship amongst and between these offices.

As the Committee defined functions, its members realized that most state water agencies paid little attention to staff development. Either there was no staff member in charge of staff development, or the concerned staff member was so junior as to not have the appropriate needed authority. Based on this realization, the MTC's second action was recommending the appointment within each of the 36 state water agencies of a "Human Resources Development Officer" of senior rank. The recommendation was quickly acted upon by the state water agencies, due in part because the agencies themselves were represented on the Committee and shared in the ownership of the recommendation. The Minister and Director of the Ministry of Water solidly supported the Committee's recommendations.

Skills training strategy: defining needs

Skills development needs were defined in two ways: an analysis of staff profiles and training needs by consultants, and an assessment of training requests submitted by the HRDOs of the state water agencies to the Project Office. It soon became clear that a comprehensive training program could be justified.

Skills training strategy: outreach

From the outset, it was decided to focus initially on the provision of training to operatives due to their critical role in keeping safe water flowing day in and day out.

The traditional approaches to skills training were considered, including transporting trainees out of their daily work environment to training institutions for workshops. But the cost was judged clearly prohibitive for the large numbers of operatives and it seemed unlikely that large groups gathered together in a traditional training institution would take part in practical skills training. And experience elsewhere demonstrated that the training was that which takes place within the trainees' own workplace focusing specifically on the trainees' daily duties, and using "hands-on" learning and practice is most likely to transfer skills effectively.

The MTC, basing their thinking on the need to deliver "hands-on" training nation-wide, and with advice from the World Bank's supervision team, devised an innovative solution: the development of an "outreach" program of on-the-job training which came to be known as the Nigeria Water Supply Training Network. The basic concept behind the Network was to provide economical, "hands-on", on-the-job training.

Skills Training Strategy: The Pilot

The Project Office next asked the newly-appointed HRDOs of each of the thirty-six state water agencies to provide more details concerning the practical training needed by the operatives to improve their competence and capacity.

Once these detailed requests were, the Project Office, working in collaboration with a single NWRI staff member, selected a small number of requests, and developed a modular skills-based curriculum to respond to each of the requests, sometimes by adapting training materials from elsewhere, but always with the help of skilled practitioners. Once the curriculum – and, in some cases, an instructor guide — was ready, a private practitioner was recruited to deliver one-week on-the-job courses within the requesting water agency headquarters.

By design, the pilot program started small, and the first pilot course - a one-week course, on pump maintenance skills, was delivered to a group of twenty operatives in the water agency workshops in Bauchi State by a technician from the supplier of most of the pumps, whose expenses, and a small fee were paid by the project. The training was delivered in a practical "hands-on" manner, and it was apparent

almost immediately that the operatives had acquired and were practicing new skills – and were even able to restore a number of "spoiled" pumps to an operational state.

A staff member from NWRI attended the Bauchi pilot session, and several others that followed, to observe the quality of delivery, and to evaluate the merits of the outreach training concept in practice.

After only ten one-week training courses were delivered, observed,

and analyzed, it became apparent that the outreach idea was working. Training was popular with both the operatives and water agency management, and this on-the-job training could be supplied at a relatively low cost: about \$90 per week per operative inclusive of all costs. This success resulted in a decision to continue and expand outreach training.

Assured funding was now needed. Discussions between the World Bank and the Ministry of Water resulted in agreement that training for the life of the project would be funded through a specially-developed credit funded 60 percent through Nigeria Federal Government funds, and 40 per cent through project loan funds.

Skills training strategy: the Outreach Office

With the outreach strategy piloted, and assured funding in place, an Outreach Office was established at NWRI. The NWRI staff member who participated in the pilot was appointed Head of Outreach Training.

From the beginning, it was considered important to keep outreach training costs low in order to maximize the amount of training that could be funded, as well as to make it more likely that outreach training could continue after close of the project.

Overhead costs were minimized partly by initially staffing the Outreach Office with just two persons - a department head and an assistant - and by continuing to hire only in-country practitioners as temporary trainers. Training space was not paid for because training took place within the workplaces of the water agencies. Only a small fee, lodging, and transport costs were paid to trainers, as in the pilot stage.

Training for Revenue Generation

Once the training of operatives was well under way, the Outreach Office responded to requests for training to support revenue generation. This training was designed and delivered in a similar manner to the training for operatives.

Expansion of Outreach Training Volume

As outreach training expanded, the Outreach Office staff increased to four people, still deliberately - and remarkably — small to serve the training needs of the state water agency operatives in a country of nearly 110 million.

To streamline the identification of trainers, a databank of nearly 500 persons was created based on response to an advertisement for experts. Even though the fee offered was below the national norm for experts, 2,000 individuals and companies applied, some, apparently, from a desire to be associated with a World Bank-funded project. In order to ensure quality and skills-based training, the Outreach Office developed Instructor Guides, Post-training Evaluation instruments, and a Training Impact Guide (see below). To further ensure quality control, every new trainer was observed and assessed using a standardized Training Monitor Protocol. Curriculum was revised as shown to be necessary.

By the third year of training, the Outreach Office was delivering over 300 trainee-weeks of practical training annually. During the fourth year, over 500 trainee weeks were delivered, and by the fifth (1999), the pace increased to over 200 trainee-weeks *per month*.

The training courses

Training delivered by outreach training focused on:

- pump maintenance and repair
- borehole maintenance
- engine and generator maintenance
- leak detection and repair
- electrical installation and repair
- repair of meters
- valve repair
- pipe network maintenance
- water quality procedures
- bookkeeping
- customer enumeration
- word processing

Measurement of training's impact

A simple Impact of Training Study was initiated and piloted for twenty of the courses delivered during 1998 and 1999 in order to help monitor the quality of training delivered. The Impact questionnaire was administered to trainees at least three months after training and a scale provided for each question. Questions concerned perceived acquisition or strengthening of skills, the relationship of training objectives to the operatives' responsibilities, and elements within the workplace promoting or hindering use of acquired skills on the job.

The questions were:

- To what extent did you understand the objectives of training prior to the start of the course?
- To what extent do you feel the course was delivered in a way to provide you with skills?
- To what extent do you feel you acquired all of the skills taught during the course you attended?
- To what extent did you learn each of the following skills? (*a separate list of ten to fifteen skills to be acquired, ranging for each course was developed in order to gather course-specific data*)
- To what extent do you feel you strengthened your existing skills?
- To what extent do you feel you acquired new skills?
- To what extent was the training related to your responsibilities on the job?
- To what extent do you feel the training was practical enough?
- To what extent have you been able to use your new or improved skills on the job? (*following these questions was a group of questions probing the extent to which each of a number of factors - such as - the presence or shortages of tools, spare parts, manuals, and support of supervisor-made it possible to use new or improved skills on the job*).

Findings

An analysis of responses from the 491 operatives who answered the Impact questionnaire indicated that training was generally delivered effectively, and that skills were acquired and practiced. Trainees' rating of these elements was a mean of 4.1 out of a possible 5.0. Written comments were also used to help the

Outreach Office make improvements in the design and delivery of courses.

One of the most significant outcomes of the study concerned the use of acquired skills on the job. Trainee responses, and follow-up inquiries by the Outreach Office, indicated that operatives felt that although they had gained skills through the training, use of the skills on the job was sometimes frustrated by shortage of specialized tools, and, especially, lack of sufficient spares (parts) to carry out maintenance. This information was, in most cases, passed on to the managers of the state water agencies concerned. At this point, it is unclear if any remedial action has taken place.

Engineering skills course

As delivery of training within the workplace continued, a need for an "induction" course for recently-hired engineers emerged.

Working with professional water engineers, the Outreach Office designed its most ambitious sub-project, a 12-week course to provide skills training at the NWRI in Kaduna, where the first course is presently underway. An effects of training study will be initiated.

Transfer of concept to Ethiopia and Ghana

The success of the Nigeria Water Rehabilitation outreach training model has encouraged its use in other projects with large capacity-building components, namely the Ethiopian Water Supply Project, and the Ghana Urban 5 Project.

For more information, please contact [David Henley](#), team leader, Nigeria Water Rehabilitation Project.

[Jack Cresswell](#) is a skills training and quality assurance specialist.

Umar Bature is the Chief Human Resources Officer in the NWRP office in Abuja.

Abiodun Aderonmu is the Head of the Outreach Training Office in the NWRI in Kaduna.