

Rural

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Water

Supply in Developing Countries

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Findings of a workshop on
held in Zomba, Malawi,
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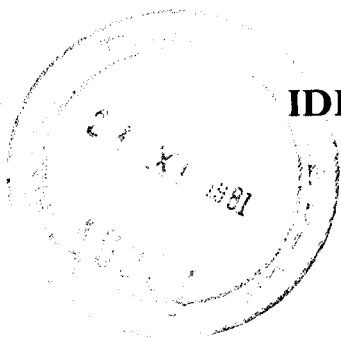
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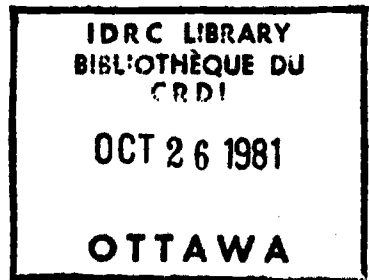
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Rural Water Supply in Developing Countries

Proceedings of a workshop on training
held in Zomba, Malawi, 5-12 August 1980



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Training Program for Technical Officers in Malawi

G.A. Kamwanja¹

The aim of this paper is to try to identify the specific training programs or curricula necessary to train the intermediate engineer, of the technical officer grade, in the rural water supply program in Malawi. It cannot be emphasized enough that developing nations must take great interest in the development of the rural population in order to ensure an even distribution of development throughout the country.

Sources for the Recruitment of Intermediate Water Engineers

If any training program is to be successful, it is essential that an appraisal be made within the country concerned of possible sources of manpower supply, i.e., schools and colleges from which interested agencies can recruit trainees for their courses.

After completion of secondary education in Malawi, students attend the University of Malawi to study subjects such as technology and business at the Polytechnic; agriculture in Lilongwe; and education, arts, and science in Zomba. It would seem inevitable, therefore, that any organization wishing to recruit and train water engineers should look upon the Polytechnic as its primary source of recruits. The students attending this college pursue a general diploma course

in engineering, with emphasis on electrical, mechanical, and civil engineering. Courses leading to a degree in engineering were started at the Polytechnic in October 1980.

The proposed training program is based on the understanding that the hierarchy of the engineering structure is such that at the top is the water engineer, of professional level; followed by the assistant water engineer, of technical officer grade; technical assistants; and the users. The training envisaged here is, therefore, that of the technical officer who once trained will supervise and work with technical assistants in the execution of designated projects, and at the same time will assist and train the users in maintaining the water supply installations after the completion of the work.

To ensure that a minimum of wastage is experienced during and after training, the prospective candidates should be recruited on a trial basis before starting the actual training. Those students showing potential for further studies after training should be encouraged and opportunities should be made available for further training to the professional level.

Training Objectives and Staff Development

The training objectives should reflect the basic established policy, i.e., to provide the rural population with potable water. Such

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training should be geared toward learning the principles that will enhance the desired goals. The training of engineers should satisfy the following broad objectives: (1) At the end of the course, the students should be able to apply the principles related to water supply with the appropriate technology to suit a particular environment. (2) They should be able to plan, manage, and liaise with staff at the junior level and with the users in the care and maintenance of the water supply.

Depending upon the extent of the training program envisaged under the rural development program, it would seem economical in the long term to establish a National School of Water Engineering, under which the nation would pool together all of its water resources personnel and expertise to develop and train students for involvement in the program.

It would be difficult for the Polytechnic to incorporate water-supply courses under the present diploma scheme without jeopardizing the character of the present course, which is general in nature. Furthermore, this would set a precedent for other departments to seek such special treatment. Certainly, the expertise available within the Polytechnic should be utilized, perhaps through the presentation of special courses at seminars, specifically arranged to cater to specialist groups.

Due to a shortage of trained personnel, local residents with previous knowledge in water supply should be recruited as field instructors; the advantage being easy communication, particularly when dealing with the users.

Criteria for Choosing Appropriate Technology

Today, one finds arguments throughout developed and developing countries about what is good for the developing nations insofar as technology is concerned. Some people still argue that teaching in developing countries should be geared toward those subject areas that are relevant to the country in question. Although this is true to some

extent, one still finds that there comes a time when the rudimentary technology becomes inadequate, perhaps due to the fact that it cannot meet the demands put upon it, and as a result an advanced technology must take over. Because of this, it is important that the intermediate engineer be knowledgeable in modern technology on the one hand, and the local technology on the other.

The concept of applying principles learned in one subject area to new situations implies that the subjects taught to technical officers should be broad in nature.

The following guidelines could be used when discussing appropriate technology for the rural water supply program: (1) the choice of technology should be one that would facilitate a significant improvement in the quantity of water; (2) the technology should be as low as possible in cost without jeopardizing the effectiveness of the improvements sought; (3) the technology should facilitate operation and maintenance by users without demanding a high level of technical skill; (4) the technology should make as much use as possible of locally available materials, thereby decreasing reliance upon imported materials; (5) where possible, the technology should encourage the growth of local manufacturing of necessary equipment and parts; (6) the technology should be compatible with local users' values, attitudes, and preferences; and (7) the technology should encourage and facilitate community involvement and participation.

Maintenance Centres and Users' Guide

It is generally found that many self-help projects fail in developing countries after they have been completed, mainly because of a lack of commitment on the part of the users to report any problems that arise. As a result, completed projects deteriorate and fail, making the whole exercise a waste of time and resources. It is, therefore, suggested that the Department of Lands, Valuation and Water should consider the idea of dividing each district into centres and

at the same time seek to employ someone from the user groups. Such a person would be identified from the action groups as reliable and would have worked together with the technical officers and assistants, as well as other local personnel on the self-help basis, throughout the entire project. This person would be left with a small workshop facility and maintenance tools, such as spanners and pipes, and would be responsible for dealing with any problems reported by the users within a given area. Depending upon the gravity of the problem reported by the users, this person would be responsible for referring the problem to the district water department office.

Syllabus

The following syllabus is suggested for a 1 year course in rural water supply engineering. The course is divided into three modules of 4 months duration, with the first module being conducted in the classroom, the second module in the field, and the third module in the classroom again.

The full-time period in the field is incorporated into the course in order to give the student first hand on-site experience and at the same time give the student an opportunity to learn and to try to identify problem areas within the existing system in hopes of improving the system for the future.

Module One

The topics covered in module one include: the importance of water to humanity; sources of rural water supply (sources of water supplies in Malawi include gravity-fed systems, boreholes, and shallow wells); feasibility studies; information analysis and recommendations; water installation systems for natural gravity systems and pressure systems; and types and principles of operation of pumps.

Module Two

For the duration of the second module the student is assigned to a work project in order to gain practical on-the-job experience.

Module Three

The topics covered in module three include: water treatment methods, i.e., removal of minerals and odours and the addition of water softeners; sedimentation techniques; sand filtration; care and maintenance of water systems; public health as related to water supply; project planning and management; resource selection and allocation; and public relations and government procedures, including government regulations and conditions of service; project reporting and communication; education for users; and organizing rural projects and the importance of local party leaders in community development.