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OCCASIONAL PAPER SERIES

THE ENVIRONMENT OF
SIMPLE WATER SUPPLIES

A selected and annotated
bibliography in support of
Public Standpost Water Supplies

IRC
WATER AND SANITATION CENTRE

021-84EN-5515

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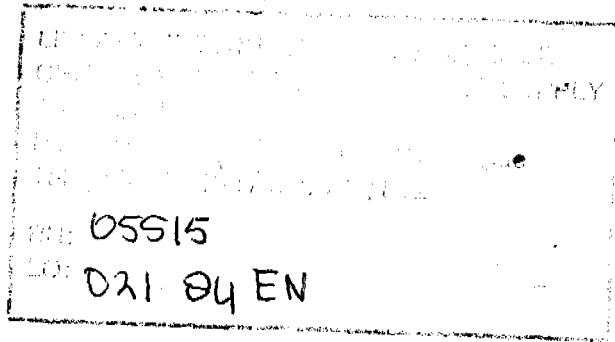
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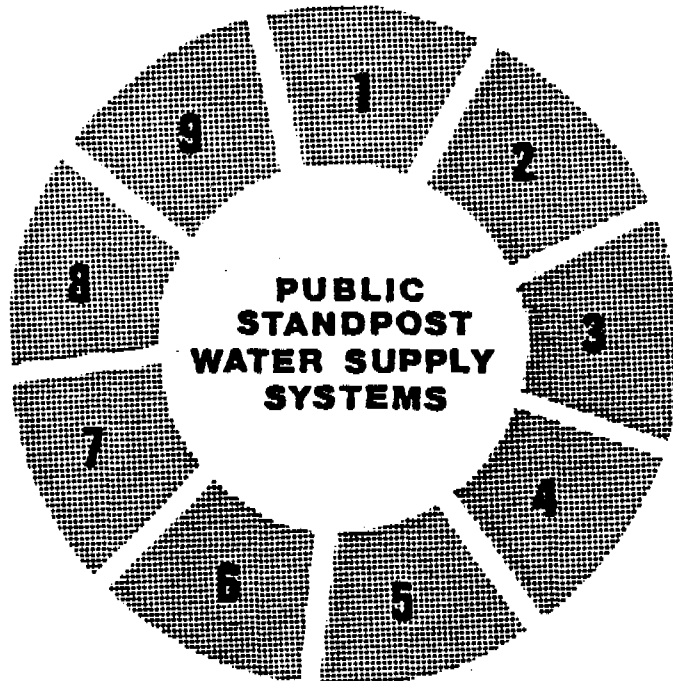
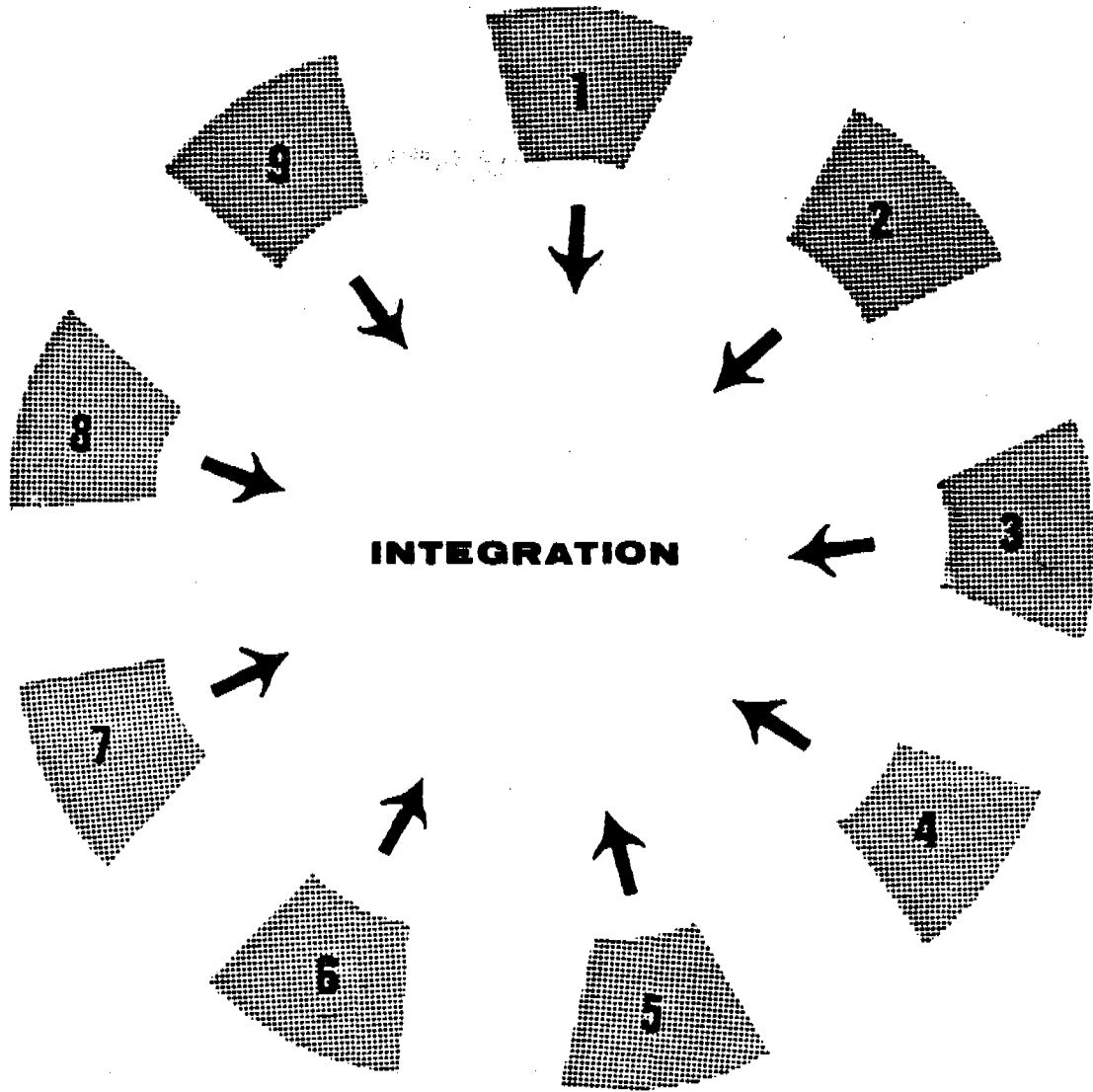
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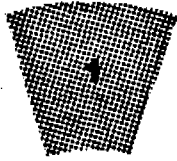
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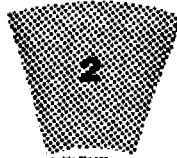
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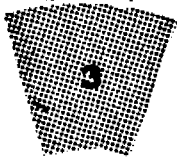
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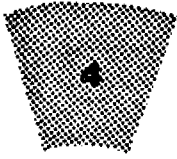
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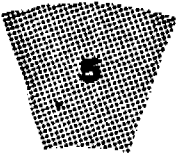
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LEGISLATION**



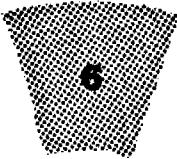
**COMMUNITY AND
SOCIAL ASPECTS**



HEALTH



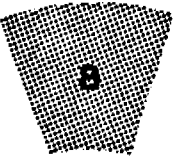
**ADMINISTRATION AND
FINANCIAL MANAGEMENT**



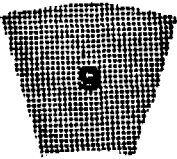
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EQUIPMENT**



**OPERATION AND
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**TRAINING AND
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ACKNOWLEDGEMENTS

This publication is the result of a team effort. The WEDC Group of the University of Technology at Loughborough, especially Susan Ball, did much of the ground work under an IRC consultancy in 1980/81. This work was subsequently extensively updated and processed by IRC's Information Section to produce the present publication.

Lia van der Kruit, Senior Documentalist at IRC, was responsible for the bulk of the revision work with technical advice from Henk Hortensius. The difficult task of text processing and administrative support was carried out by Paulette Kalker, Chantal Stenfert, Cynthia Raley, Anneke Groenendal and Hanny van Eerden with editing by George Bedard.

Libraries and institutions both in the Netherlands and elsewhere assisted in supplying documents and photocopies.

Finally we should like to acknowledge the help of those who reviewed and commented on the work. To each of these contributors and others we extend our grateful thanks.

'THE ENVIRONMENT OF SIMPLE WATER SUPPLIES'

PREFACE

The title of this bibliography is deliberately chosen. For it is clear that the simple technical nature of public standpost water supplies often belies the complexity of the system as a whole. Organisational, social, economic and technical aspects are all important and if they are to work and be of benefit, the environment of simple water supplies must be complete.

Such an environment embraces many other areas in addition to the purely technical and this bibliography is an attempt to guide access to some useful work on each of these important component subjects. Such a concept of integrated sector development has been a keynote of IRC work for some years and this publication continues that trend.

We have tried to reflect the major components of a project's environment through 'chapters' of the bibliography and the keyword headlines. This approach has reinforced our awareness that technical matters, important though they remain, continue to be studied and reported on to a much greater degree than other aspects, particularly Operation and Maintenance, Community Hygiene Education and Community-level Financial Management. We hope therefore that a secondary effect of this bibliography will be to stimulate further activity and reporting on some of the neglected components. We look forward to the bibliography being used and critically commented on and hope users will let us know of additional references which could be included in future editions.

A bibliography is only a starting-point and we hope readers will see this publication as a useful stepping stone in gaining access to relevant literature. Perhaps too it may succeed in acting as a pointer to where gaps in knowledge need to be filled.

1. INTRODUCTION

1.1 Background

This selected and annotated bibliography has been developed for use in support of the Public Standpost Water Supplies Project, an integrated demonstration project currently underway in Indonesia, Malawi, Sri Lanka and Zambia.

It is primarily intended for use by Project Staff of the participating countries and others involved with the project and could be used both as a source of information and as a means of promoting the integrated approach.

However, a wider use is also anticipated and it is hoped that others may find the bibliography of use at a variety of levels in support of their work.

The bibliography forms part of a series of support papers to the Public Standpost Water Supplies Project. Nearing completion are Guidelines on Community Hygiene Education, Guidelines on Community-based Financial Management for Public Standpost Water Supplies and Guidelines on Operation and Maintenance are planned in the future. These papers are supplementary to IRC's two technical papers on public standpost water supplies (TP 13 and TP 14) which form the basis of the project.

1.2 The Integrated Approach

In the Public Standpost Water Supplies Project the integrated approach to community water supply and sanitation is being strongly promoted. Thus as well as technical aspects, socio-cultural, economic and organisational factors are being taken into account and given the necessary emphasis. The chapters of the bibliography reflect this approach and are equivalent to the main project components. However, as in the project, none of the components/chapters are independent. Each contributes to the whole and overlaps or has a bearing on other components. The fact that a reference has been allocated to a particular chapter should not be taken therefore as an indication of its narrowness, but rather as a first indication of where its main emphasis lies.

1.3 Selection Rationale

The present bibliography is based on literature research (including abstracts and keywords) carried out in 1980/81 by the WEDC Group of the University of Technology at Loughborough, under an IRC Consultancy.

Apart from many references compiled by the WEDC Group, the bibliography offers titles of documents published after 1980 and some additional titles published before that date which are now thought to be relevant to the planned use.

This additional literature research was carried out in libraries within the Netherlands of which IRC's library proved to be the richest source. At the latter, reference journals, acquisitions of the last few years, the keyword catalogue and references in publications were checked.

The bibliography does not however intend to be exhaustive. It offers instead selected references in a range of subjects considered relevant to public standpost water supply systems.

The selection of references for inclusion was a difficult task. Although we have felt it necessary to include some general texts, the emphasis has been on developing countries, rural or urban fringe communities and on water supplies that include a considerable number of public standposts.

As most documents encountered were published in English, it was decided for this first edition to include English language literature only.

We have concentrated on references available to IRC and WEDC at the time of the searches.

The inclusion of a reference does not however indicate an endorsement by IRC or others.

Some older documents were not used for the bibliography as they were often no longer readily available to future readers.

As already mentioned some subjects are over-subscribed and the number of references selected in certain chapters tends to reflect that imbalance.

On the technical side, boundary limits have been set to include the distribution system, the standposts themselves, the interface between user and 'hardware' and community/social issues. Except where they appear in some general texts therefore there are few references relating to pumping, sources and headworks.

1.4 Future Development

The bibliography aims to give an overview of the most relevant literature published up to September 1983 in the field of public standpost water supplies and related subjects.

New documents on the subject will of course be published in the future and hopefully comments on the present work received.

For these reasons a periodical updating of the bibliography is intended (or alternatively the periodic issue of supplements to it), as a continuing service to users.

As has already been mentioned, some chapters and keywords have few references allocated to them at present. Suggestions for references in the weaker areas and new works of particular relevance to other categories are invited. A copy of the article or a full reference sent to IRC with a reference to this bibliography would be greatly appreciated.

In general any suggestion or comment on how this bibliography might be improved, particularly comments on the appropriateness and categorisation of the references would be welcome.

On a wider basis, it is hoped that the bibliography may help identify further areas for study, research and reporting in the future in the continuing effort to strengthen the appropriate knowledge base in Community Water Supply and Sanitation.

A literature review of Public Standpost Water Supplies is being considered for the future.

1.5 Using the Bibliography

Access to the Bibliography is possible in several different ways:

Firstly a division into Chapters has been made, the titles of which are related to the 'components' of the working environment of public standpost water supply systems. These are:

- Planning, Economics and Evaluation
- Organisation and Legislation
- Community and Social Aspects
- Health
- Administration and Financial Management
- Technical Aspects, Design and Construction
- Materials, Parts and Equipment
- Operation and Maintenance
- Training and Manpower Development

There are also chapters covering General references and those relating to specific Country Studies. References are arranged alphabetically by title in each chapter.

Alternative methods of access to the bibliography are via:

- a structured list of keywords referring to the reference numbers in the bibliography;
- an alphabetical list of keywords referring to the structured list of keywords;
- an author index;
- a list of institutions which have acted as corporate authors or publishers;
- a list of countries.

Each reference has been allocated a number of keywords and these have been arranged into structured groups. A group-title keyword is indicated by the keyword appearing in underlined capitals.

1.6 Obtaining Selected References

When a reference is of interest users should first seek a copy of the work via their regional or national library facilities, using the full references given.

A second course to follow would be to write to the publishers (the addresses of major publishers are given in Annex VI). Publishers can often guide to local suppliers, bookshops and lending institutions.

Thirdly IRC may be able to help by providing photocopies of extracts, subject to copyright and for a nominal fee (which may be waived in certain circumstances).

Alternatively IRC could guide the enquirer to suitable sources, libraries, publishers or bookshops.

For IRC's own publications, non-commercial organisations as well as individuals based in or from developing countries can apply for a complementary copy.

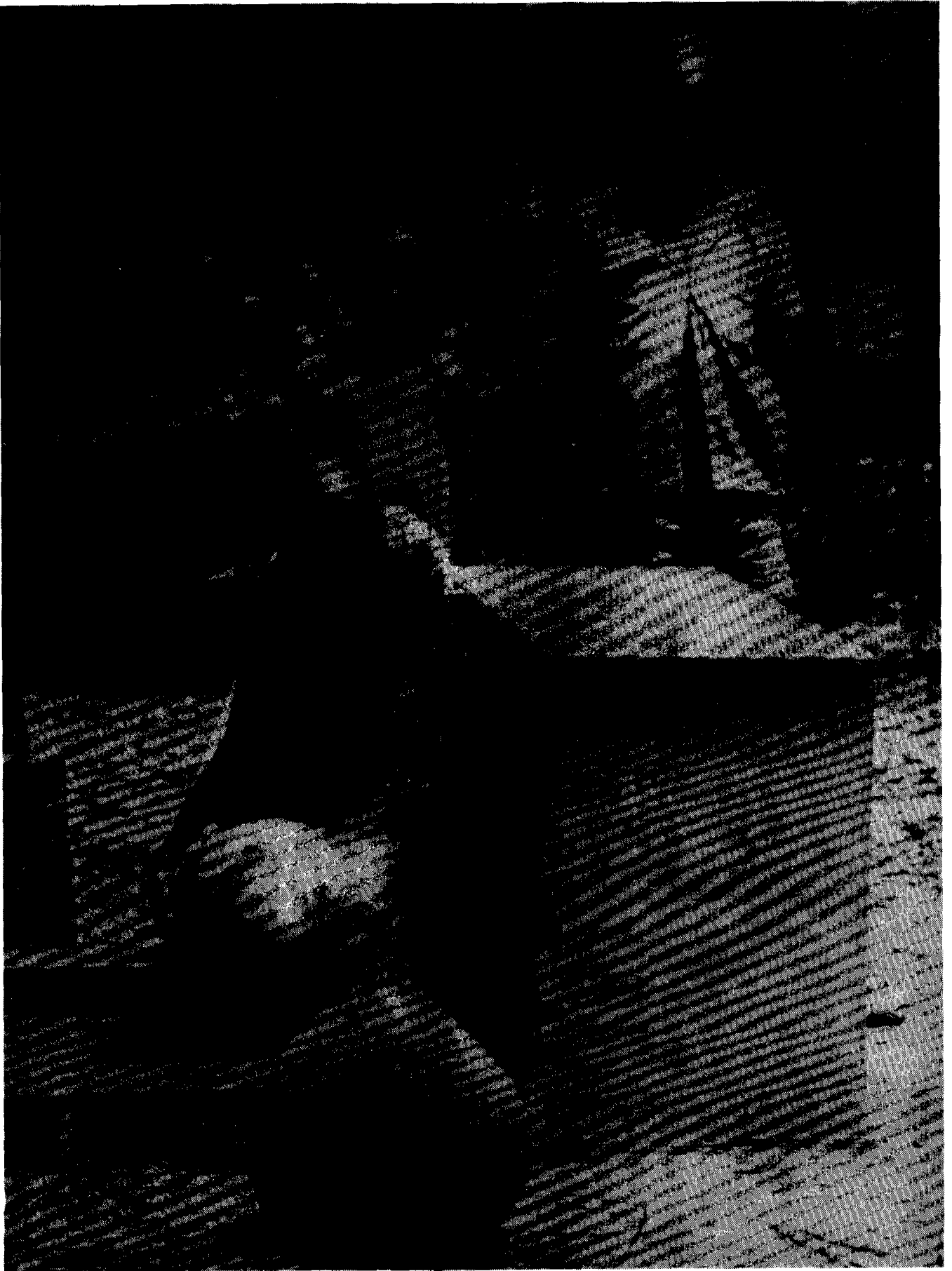


Photo: Zafar

2. BIBLIOGRAPHY

2.0 GENERAL

320 305A5

- (1) KALBERMATTEN, John M., DeAnne S. JULIUS and Charles G. GUNNERSON.

Appropriate technology for water supply and sanitation;
technical and economic options.

Washington, D.C., World Bank, December 1980. IX, 124 p., ref.
Appropriate technology for water supply and sanitation, vol. 1.

A report on the World Bank research project findings. Included is a discussion of the programme planning necessary for the successful provision of socially, economically and environmentally acceptable water supply and sanitation, using available technologies.

Keywords: case study, education of communities, evaluation, excreta disposal, organisation, participation, potability

200 7516 5

- (2) PINEO, C.S. and D.V. SUBRAHMANYAM.

Community water supply and excreta disposal situation in the developing countries;
a commentary.

Geneva, World Health Organization, 1975. V, 41 p., ref.
WHO offset publication no. 15.

An analysis and commentary on some relevant data from the WHO World Health Statistics Report of 1973. Progress made in the urban sector from 1962-1970 is reviewed and future prospects considered.

Keywords: case study, data collection, disease, evaluation, excreta disposal, government investment, manpower requirements, participation, statistics

- (3) READ, Geoffrey H.

Features of water supply and sanitation in developing countries.

Paper 4 in: Wakelin, R.H.M. (ed.). Drainage and water supply for buildings; proceedings of a two-day seminar on current research and future needs and objectives, Brunel University, June 3 and 4 1980. Uxbridge, Brunel University, Drainage Research Group, 1980? P. 63-89, ref.

The paper outlines the situation in developing countries and highlights some of the immediate needs and areas for further investigation, as identified by the World Bank Technical Advisory Group. Included are outline drawings for the simple design of public standposts.

Keywords: excreta disposal, public standpost design, scale effects, Water Decade

- (4) COURTNEY, John and Aryeh COOPERSTOCK

Meeting the urban poor's basic water and sanitation needs.

In: Aqua, 1979, no. 6, p. 47-48.

Using examples of World Bank supported projects in particular developing countries, the authors review realistic approaches and solutions needed to help alleviate water and sanitation problems in urban areas, especially slum and squatter settlements. Emphasis is placed on targets, charging policies, management and planning.

Keywords: Cameroon, charging policy, disease, house connections, Kenya, Libya, multi-national agencies, squatters, Sudan, urban areas

(5) Public standpost water supplies.

seen
Voorburg, WHO International Reference Centre for Community Water Supply, November 1979. 104 p., ref.
Technical paper series, no. 13.

Describes the public standpost system as a realistic, affordable, and technically sound solution to the problems of reaching the Water Decade goals. The publication is intended as a guide to proper planning, implementing and managing such supplies and to approaching the socio-cultural and managerial problems encountered in operation and usage of the systems.

Keywords: PLANNING

71 ID 77

(6) Public standposts for developing countries;

proceedings of an international expert meeting held in Achimota (Accra), Ghana, 8-12 August, 1976.

Voorburg, WHO International Reference Centre for Community Water Supply, May 1978. 61 p.
Bulletin Series, no. 11.

A review of a draft report under headings of organisation and management, economics and planning, socio-cultural factors, technology, planning and design, together with subsequent recommendations. Individual presentations were also given by participants, giving accounts of systems in their own countries which highlighted common problems and aspects.

Keywords: Afghanistan, Cameroon, Ghana, India, Indonesia, Nigeria, organisation, participation, public standpost design, Sudan, Surinam, Tanzania, tap design, traditions, Turkey, valve design

71 UNDO P

- (7) Rural water supply;
report of a United Nations interregional seminar, Uppsala,
Sweden, 6-17 October 1980.
New York, N.Y., United Nations, Department of Technical
Co-operation for Development, 1981. V, 44 p.
TCD/SEM.81/1.

The seminar was held as a contribution to the Water Decade and focused on a limited number of development issues. Emphasis was placed on the great importance of financial and human resources to ensure proper management, together with integration of water supply schemes into other economic schemes and on-going education and maintenance programmes.

Keywords: case study, disease, education of communities, legal aspects, organisation, participation, preventive maintenance, training, Water Decade, women

- (8) ROURE, J.

Standpipes in tropical Africa.

In: Information and documents, no. 3, September 1975, p. 15-26.

The article deals with the advantages of using public standposts in most African cities instead of using house connections. Furthermore, it discusses the minimum water requirements per capita per day, the installation costs of a public standpost and the operation and management problems, especially the need to recover the price of the water issued by the public standpost and the need to provide for equipment maintenance, and cleanliness around the distribution points.

Keywords: public standpost, supervision, water demand

- 205.2 76 VLS
- (9) Village water supply.
Washington, D.C., World Bank, March 1976. 96 p., ref.
World Bank paper.

Concentrates on the problems peculiar to rural water supply for domestic use and suggests possible ways to overcome the current state of what is described as neglect.

Keywords: government investment, metering, multi-national agencies, organisation, participation, revenue collection, rural areas

- 200 77 WA
- (10) PACEY, Arnold (ed.).
Water for the thousand millions;
written by the Water Panel of the Intermediate Technology
Development Group.
Oxford etc., Pergamon, 1977. VI, 58 p., ref.

An attempt to define criteria of appropriateness relevant to design and evaluation of individual village water supplies. The authors deal with possible reasons for project failures, government policies, availability of funds and shortage of skilled manpower. Emphasis is placed on the need to assess the needs in each situation individually.

Keywords: criteria of design, disease, evaluation, government investment, participation, pipeline design, preventive maintenance, public standpost design, requirements in manpower, rural areas, supply systems, training, water quality

2025 70 WAS

- (11) FEACHEM, Richard, Elizabeth BURNS, Sandy CAIRNCROSS et al.

Water, health and development;
an interdisciplinary evaluation.
London, Tri-Med, 1978. XV, 267 p., ref.

An extended report based on an evaluation of village water supplies in Lesotho. The authors' findings are reported and then, together with other world-wide studies, they are used as the basis for general discussion on all aspects of planning and design of water projects in developing countries.

Keywords: case study, disease, evaluation, hygiene, implementation, Lesotho, organisation, organisation of communities, participation, rural areas, self-help, sources of water, traditions, usage, water committee

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- (12) HOLLOWAY, Arthur H.

Water supply and sanitation problems in Asian countries.
In: Pescod, M.B. and D.A. Okun (eds.). Water supply and wastewater disposal in developing countries; proceedings of a water supply and sanitation seminar held in Bangkok 19-23 January 1970. Bangkok, Asian Institute of Technology, January 1971. p. 17-19.

An outline of the main problems - money, management, manpower and motivation - defined as factors which inhibit the expansion and success of water and sanitation programmes. Some possible solutions are presented.

Keywords: bilateral agencies, education of communities, government investment, multi-national agencies, organisation, training

ict,

- (13) PESCOD, M.B. and D.A. OKUN (eds.).

Water supply and wastewater disposal in developing countries;
proceedings of a water supply and sanitation seminar held in
Bangkok 19-23 January 1970.

Bangkok, Asian Institute of Technology, January 1971. VIII, 311 p.

Edited papers from a water supply and sanitation seminar. Useful papers on finance and contracting are found in the section on planning water projects. Other sections are on water quality management and water resources development. More specific papers are in the section on the Asian situation, but problems and solutions outlined would often be applicable generally.

Keywords: PLANNING

- (14) WAGNER, Edmund G. and J.N. LANOIX. 201 5961

Water supply for rural areas and small communities; 5th rev. impr.
Geneva, World Health Organization, 1959. 340 p., ref.
World Health Organization monograph series, no. 42.

Emphasis is placed on the public health benefits of an adequate water supply. The authors outline the stages of producing a system, from initial considerations through planning and installation to operation, management, finance and long-term planning.

Keywords: disease, distribution system design, meter design, organisation, participation, public standpost design, revolving funds, sources of water, supervision of operation, training, water quality

- (15) WHITE, Gilbert F.

Water supply service for the urban poor; issues.

Washington, D.C., International Bank for Reconstruction and Development, August 1977. VI, 42 p., ref. P.U. report no. PUN 31.

The report examines the implications of Water Decade policy, with reference to selection of target populations, types of service possible, health aspects, appropriate pricing policies, community participation and research needs.

Keywords: education of communities, potability, pricing policy, subsidy, Water Decade, water quality

- (16) FEACHEM, Richard, Michael McGARRY and Duncan MARA (eds.).

Water, wastes and health in hot climates; repr.
Chichester etc., Wiley, 1980. XVI, 399 p., ref. 1st pr. 1977.
A Wiley-Interscience publication.

A comprehensive review of the health aspects associated with water supply and sanitation. Deals in three sections with water quality, low cost supplies and institutional development.

Keywords: HEALTH, criteria of design, disease, excreta disposal, participation, usage, water quality

2.1 PLANNING, ECONOMICS AND EVALUATION

- Ø (17) LAURIA, Donald T. and Keith A. DEMKE. 4661 ✓

Costs of alternative water supply and sanitation services in Brazil.

S.I., s.n., March 1980. V, 20 p.
Report to the World Bank

A report of the case study of Rio Casca, Brazil, to investigate the costs of alternative levels of service, from full plumbing to public standposts, and from conventional sewerage to ventilated pit latrines. Cost benefits in terms of convenience and health are examined in detail with regard to upgrading within the specified levels.

Keywords: COSTS, Brazil, case study, estimation costs, investment costs, pipeline design, scale effects, Water Decade

- (18) SAUNDERS, Robert J. and Jeremy J. WARFORD.

Economic incentives and appropriate technology in village water supply.

In: Gunnerson, Charles G. and John M. Kalbermatten (eds.). Appropriate technology in water supply and waste disposal; proceedings of a session sponsored by the Research Council on Environmental Impact Analysis of the ASCE Technical Council on Research at the ASCE National Convention in Chicago, Illinois, October 16-20, 1978. New York, N.Y., American Society of Civil Engineers, 1979. P. 53-60, ref.

The authors argue that development of new appropriate techniques or the adaptation of existing ones in new areas is likely to be futile without an adequate system of incentives in the form of rewards and penalties which would make inappropriate technology no longer viable.

Keywords: ECONOMICS, government investment, self-help

(19)

CHAUDHURI, Nilay and Swades Kumar BHATTACHARYA.

41003 ✓

An enquiry into the rationale for selection of medium and small towns for organised piped water supply schemes.

In: Journal of the Indian Water Works Association, vol. XI, no. 1, Jan.-March 1979, p. 137-144, ref.

An attempt to evolve a rationale for estimating the cost of provision of organised piped water supply of a reasonable standard, and to establish a relationship between system costs and population densities to provide a basic guideline for the selection of communities according to size, population density and available finance.

Keywords: criteria of design, estimation costs, India, sources, urban areas

(20) HOFMAN, H. and B. van BRONCKHORST.

Estimating daily water requirements for planning rural water supply projects.

Rotterdam, Iwaco / Jakarta, Pt. Unisystem Utama, October 1982. III, 23 p.

West Java rural water supply project OTA-33. Draft.

In reviewing the data on water communicable diseases, and considering actual water use patterns in rural (remote) communities, an analysis could be made of the potential benefits of applying certain safe water supply rates (lcd, i.e. liter per capita per day). The paper indicates how to use the lcd in designing systems, and for long term planning of water supply improvement.

Keywords: demand, disease, health

- (21) CAIRNCROSS, Sandy, Ian CARRUTHERS, Donald CURTIS et al.

Evaluation for village water supply planning

Chichester etc., Wiley / Voorburg, WHO International Reference Centre for Community Water Supply, February 1980. XVIII, 179 p., ref.

Technical paper series, 15.

The authors advocate that proper evaluation is necessary in order to use to best advantage the increased investment brought about by Water Decade initiatives. Particular subject areas for evaluation are discussed in detail, such as design and costs, operation and maintenance, water quality, health and local organisation. Methods of collecting and analysing data are described and possible problems and solutions outlined.

Keywords: data collection, disease, evaluation, government investment, multi-national agencies, organisation, participation, rural areas, self-help, Water Decade, women

- (22) SCOTNEY, Norman.

Evaluation of the rural water supply programme;

report on some relevant social factors based on a survey of the three RWS I schemes.

S.I., Republic of Kenya, The Ministry of Water Development, December 1976. II, 80 p.

After an evaluation of three rural water supply schemes recommendations are given for short-term and longer-term activities. Among many other things an investigation is made of the reasons of damage that has been caused to a number of recently constructed rural water supply schemes.

Keywords: COMMUNITIES, SOCIO-CULTURAL ASPECTS, evaluation, Kenya, revenue collection, training

(23) KROMBACH, Juergen.

Foreign aid, the World Bank and financing of water supply and sewerage projects.

In: Pescod, M.B. and D.A. Okun (eds.). Water supply and wastewater disposal in developing countries; proceedings of a water supply and sanitation seminar held in Bangkok 19-23 January 1970. Bangkok, Asian Institute of Technology, January 1971. P. 49-66, ref.

With reference to the Pearson Report and the Commission on International Development, this paper describes in detail the role of multi-national and bilateral agencies in the financing of projects. It includes a description of the origin, nature and function of the World Bank Group, and the criteria used by them for appraisal of a proposed project.

Keywords: bilateral agencies, investment costs, multi-national agencies, organisation

V 325
(24) Guidelines for sector work in the water supply and waste disposal sector.

Washington, D.C., International Bank for Reconstruction and Development, November 1973. 1, 31 p.

The guidelines suggest a means for acquiring information needed for the preparation of development plans. Several typical sector issues are discussed together with practical considerations for organising sector work. Emphasis is placed on detailed planning.

Keywords: criteria of design, data collection, leakage, metering, organisation

(25) Guidelines on planning and management of rural water supplies in developing countries;

by the ITDG Water Panel.

In: *Appropriate technology*, vol. 7, no. 3, December 1980, p. 17-20, ref. ✓

The article highlights some of the basic principles involved in the planning and management of rural community water supply schemes. It takes into account future management, appropriate technology, local conditions, sources, supply reliability and operation and maintenance.

Keywords: optimization, participation, rural areas, sources of water, supply systems, women

(26) CARRUTHERS, I.D. ✓

Impact and economics of community water supply;
a study of rural investment in Kenya.

Ashford, Kent, Wye College, Agrarian Development Unit, 1973. VII, 120 p., ref.

Agrarian development studies, report no. 6.

This study examines the rationale for the government policy of rural water supply improvement in Kenya. It also appraises the means used to achieve the objectives and recommends ways of improving the cost-effectiveness of investment. A case study of the first major water scheme in Kenya is included.

Keywords: case study, criteria of design, disease, government investment, house connections, Kenya, pricing policy, public standpost design, rates, rural areas, self-help, subsidy

(27)

International training seminar on community water supply in developing countries;

a compilation of papers presented during the seminar held in Amsterdam, the Netherlands, 6-10 September, 1976.

Voorburg, WHO International Reference Centre for Community Water Supply, November 1977. 272 p., ref.

Bulletin series, no. 10.

The seminar was held in order to exchange ideas and experiences and discuss approaches, methods and techniques for better water supply and sanitation coverage in developing countries. Various aspects are dealt with such as policy, planning, organisation and management, finance, human factors and technology.

Keywords: ADMINISTRATION, PLANNING, distribution system design, Latin America, manufacture, Mexico, organisation, participation, pricing policy, requirements for manpower, training

(28)

Lubuk Linggau water supply project masterplan study;
final report.

S.I., Directorate General Cipta Karya, Indonesia / s.I., Directorate of Technical Assistance, Netherlands / Amersfoort, DHV Consulting Engineers, April 1978. 297 p.

Six Cities Water Supply Project.

A feasibility study and designs for improved water supply for Lubuk Linggau, a city in south Sumatra. The objective was to supply as large a proportion of the population as was technically and economically feasible with water from a public water supply system. The system consisted of house connections, yard connections and public taps. Although specific to one city, the information given and methods used would provide useful reference for other projects.

Keyword: COSTS, DESIGN, PLANNING, calculations, criteria of design, data, distribution systems, education of manpower, Indonesia, legal aspects, organisation, public standpost design, rates, sources of water, tariffs, training, usage

- (29) Minimum evaluation procedure (MEP) for water supply and sanitation projects.
Geneva, World Health Organization, 1983. 51 p., glossary.
ETS/83.1.
CDD/OPR/83.1.

This document intends to describe a relatively cheap, simple and quick method of evaluating water supply and sanitation projects which employ simple technologies.

The purpose of evaluation and the purpose of the MEP are discussed and a step-by-step procedure for evaluation is outlined. Indicators for the functioning and the utilization of facilities are discussed, documented experience from impact evaluation studies is summarized and information on data gathering techniques is presented.

Keywords: data collection, evaluation

- (30) KABLER, Paul W.

New ideas for evaluating public water supplies.

In: Pescod, M.B. and D.A. Okun (eds.) Water supply and wastewater disposal in developing countries; proceedings of a water supply and sanitation seminar held in Bangkok 19-23 January 1970. Bangkok, Asian Institute of Technology, January 1971. P. 129-133, ref.

An outline of the stages needed for a proper evaluation of a water supply, to include a study of the source and of practices and protection applied to the supply, with emphasis on health. Included is a section on water quality and treatment in connection with published drinking water standards.

Keywords: disease, evaluation, water quality

(31) PINEO, Charles S.

Observations of rural water supply and sanitation programs in eight developing countries ✓

Washington, D.C., International Bank for Reconstruction and Development, September 1978. VIII, 58, 19 p., ref. P.U. report no. PUN 42.

Following a survey, the report identifies and analyses the technical, financial, organisational and managerial factors contributing to the success or failure of projects surveyed. Recommendations are made on programme design and implementation with emphasis on government commitment, community participation and strong executive agents.

Keywords: Bangladesh, bilateral agencies, case study, Colombia, Dominican Republic, government investment, house connections, implementation, Kenya, Korea, Malaysia, multi-national agencies, participation, Peru, rates, subsidies, training, Upper Volta

(32) OKUN, Daniel A., and Frederick E. McJUNKIN.

Planning and developing water supply programs in developing countries.

✓ In: Water for peace. Vol. 7. Planning and developing water programs. Washington, D.C., U.S. Government Printing Office, 1971. P. 35, ref.
French and Spanish abstracts.

The paper deals with the relationship between planning policy and design criteria and the development of local design standards. Emphasis is placed on the need to bring water to as many people as possible, rather than using complex and expensive engineering. Sections also on the use of consultants, local personnel training, and the creation of central water authorities.

Keywords: criteria of design, planning supplies, sources of water

- (33) DONALDSON, David.

Planning water and sanitation systems for small communities.

Paper 5 in: International training seminar on community water supply in developing countries; a compilation of papers 1976.

Voorburg, WHO International Reference Centre for Community Water Supply, November 1977. P. 71-103.

Bulletin series, no. 10.

Rural water supply has unique characteristics and is not just a scaled-down version of urban systems. It is claimed that for a scheme to work successfully there must be community participation at all levels, technical flexibility, use of trained sub-professionals and compilation of appropriate data. An example shows the stages of planning a village water supply including the budgeting and estimation of materials.

Keywords: data, estimation costs, participation, rural areas, scale effects

- (34) GILLING, W.J.W.

La politique de la Banque Mondiale en matière / World Bank tariff policies.

In: Aqua, 1980, no. 2, p. 6-11.

French/English.

The article explains how government efforts to subsidise water consumption through low tariffs often favour high income consumers while denying access to poorer groups. It also reports on the World Bank review of per capita costs of achieving Water Decade targets and concludes that tariffs will be necessary in order to achieve these targets.

Keywords: Africa, multi-national agencies, tariffs, Water Decade

- (35) Republic of Terrania;
a case study on the economic and financial aspects of programmes and projects in the drinking water supply and sanitation sector. S.1., World Health Organization/World Bank, 1980. VI, 131 p., ref.

Through description of the constraints in the water supply and sanitation sector and development in the fictitious Republic of Terrania, this paper sheds light on sector development issues as they are occurring in many countries. Experiences from many sector studies by WHO/World Bank are summed up.

Keywords: FINANCIAL ASPECTS, PLANNING, case study, participation, monitoring

- (36) Sectorial evaluation (ex-post) of urban and village water supply projects. 2 vols.
Brussels, Commission of the European Communities, Directorate-General for Development, August 1978.
Vol. I. Summary and conclusions. 22 p.
Vol. II. IX, 135 p.

A report of the results of 29 completed water supply projects in six different countries. Its purpose is to highlight points that emerge from the specific experience acquired, to help in the future design and planning of projects.

Keywords: Chad, evaluation, Ivory Coast, Niger, participation, public standpost design, rural areas, Senegal, sources of water, tariffs, Togo, Upper Volta, urban areas

- (37) SAUNDERS, Robert J. and Jeremy J. WARFORD.

Village water supply;

economics and policy in the developing world.

Baltimore/London, Johns Hopkins University Press, 1976. XIII, 280 p., ref.

Publ. for the World Bank.

A study with the emphasis on the economic, social, financial and administrative issues characteristic of village water supply and sanitation programmes. Suitable policy recommendations are made.

Keywords: ECONOMICS, FINANCIAL ASPECTS, case study, disease, house connections, metering, pipeline design, pricing policy, rates, revolving funds, rural areas, scale effects, waste reduction, water committees

- (38) SAUNDERS, Robert J. and Jeremy J. WARFORD.

Village water supply and sanitation in less developed countries.

Washington, D.C., International Bank for Reconstruction and Development, March 1974. V, 139 p., ref. P.U. report no. RES 2.

An attempt to identify factors to be considered in planning investments in potable water supply systems for rural areas. These factors are then analysed in view of achieving development goals, and measuring the extent of any success.

Keywords: PLANNING, charging policy, disease, evaluation, participation, rural areas, training, women

(39) HACKETT, O.M. and George H. DAVIS.

Water data for progress.

In: Pescod, M.B. and D.A. Okun (eds.). Water supply and wastewater disposal in developing countries; proceedings of a water supply and sanitation seminar held in Bangkok 19-23 January 1970. Bangkok, Asian Institute of Technology, January 1971. P. 87-94, ref.

A description of the types of data needed as a basis for water development and management, together with common methods and techniques. Included is a table of typical problems and questions together with the type of data needed in each case to provide an answer.

Keywords: data, data collection, sources of water, training

2.2 ORGANISATION AND LEGISLATION

(40) DAVE, S.D.

Management of rural water supply.

In: Journal of the Institution of Engineers, India, vol. 58, no. EN3, June 1978, p. 63-65.

The paper stresses the need for co-ordinated development of all aspects of village life including industry, education, health, transport, water supply, drainage and housing, in order to achieve a significant community development. This is only possible through efficient, co-ordinated management.

Keywords: India, organisation, organisation of communities, rural areas

(41) BRADLEY, Robert M.

Selection of consulting engineers for public health projects in developing countries.

In: Effluent and water treatment journal, vol. 19, no. 6, June 1979, p. 299-301, 303.

The author outlines criteria adopted by developing countries for the selection of consulting engineers for public health projects and describes the tender procedures used. Possible ramifications of the use of low-cost technology schemes to meet Water Decade targets are also discussed.

Keywords: bilateral agencies, multi-national agencies, Water Decade

(42) CAPONERA, D.A.

Water laws in Moslems countries. 2 vols.

Rome, Food and Agriculture Organization of the United Nations, 1973.

Vol. 1. VI, 223 p., ref.

Vol. 2. III, 311 p.

FAO irrigation and drainage paper 20.

Two volumes, giving a comprehensive study of the complex system of water rights in Moslem countries, which has developed over generations from traditions and customs. Volume I has the general introduction together with twelve individual country studies. Volume II continues the country studies.

Keywords: ADMINISTRATION, case studies, customs, legal aspects, religious aspects, traditions, usage, water codes

(43) DUNCAN, J.W. Kwamina.

Water legislation.

In: Nigerian journal of engineering, vol. 1, no. 2, December 1975, paper no. NJE 0007C, p. 49-51, ref.

A brief review of the main aspects of water legislation in African countries. The author comes to the conclusions that water laws in most African countries are sound and adequate; it is poor enforcement which has caused problems.

Keywords: ADMINISTRATION, Africa, legal aspects, water codes

(44) HODGES, Frank O.C.

Water legislation and institutions;

their role in water resources development and management.

S.l., s.n., 10 p., ref.

Repr. from: Proceedings Second World Congress, International Water Resources Association, New Delhi, India, December 1975, Vol. IV, p. 5-14.

The author endeavours to discuss the various facets of water use, with some views and recommendations as to possible legislative methods.

Emphasis is placed on the need for relevant legislation and controlling methods as part of the development of water resources in any country.

Existing systems are described and compared, together with sections on water rights, priorities for use, pollution, land reform, emergency powers and water institutions.

Keywords: ADMINISTRATION, legal aspects, sources of water, water codes

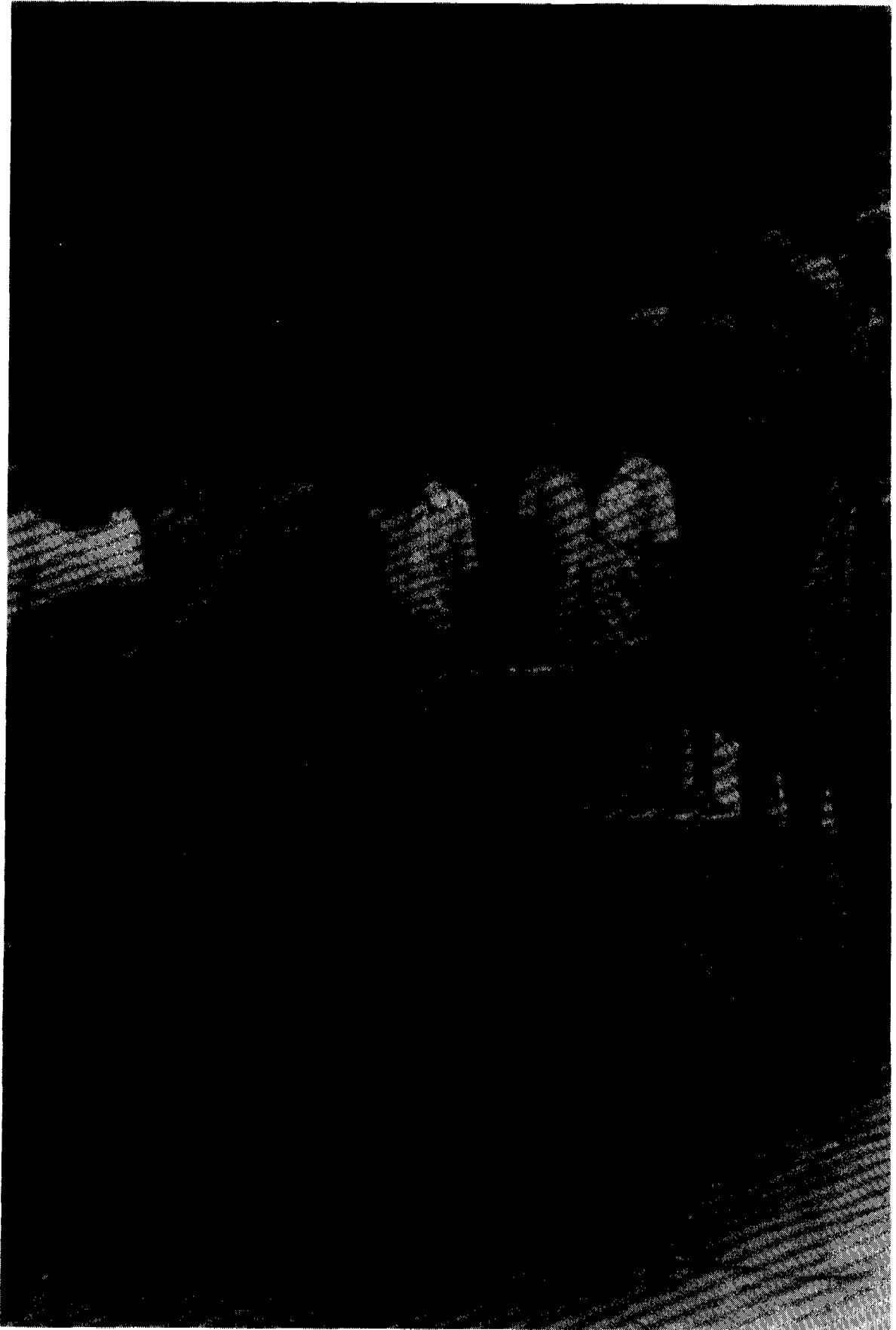


Photo: VDO / G. v.d. Zwan

2.3

COMMUNITY AND SOCIAL ASPECTS

(45) ELMENDORF, Mary and Patricia BUCKLES.

Appropriate technology for water supply and sanitation; sociocultural aspects of water supply and excreta disposal.
Washington, D.C., World Bank, December 1980. XII, 69 p., ref.
Appropriate technology for water supply and sanitation, vol. 5.

A report concerned with the social and cultural factors influencing people's responses to water supply and sanitation. It describes methods used for investigations of this type and suggests an approach which could be used by planners to integrate socio-cultural considerations into project design, to help ensure that new technologies will be accepted, properly used and maintained.

Keywords: SOCIO-CULTURAL ASPECTS, case study, Colombia, data collection, El Salvador, evaluation, Guatemala, hygiene, Mexico, Nicaragua, survey, women

(46) WHITE, Anne U. and Gilbert F. WHITE.

Behavioral factors in selection of technologies.

Paper 2 in: Gunnerson, Charles G. and John M. Kalbermatten (eds.). Appropriate technology in water supply and waste disposal; proceedings of a session sponsored by the Research Council of Environmental Impact Analysis of the ASCE Technical Council on Research at the ASCE National Convention in Chicago, Illinois, October 16-20, 1978. New York, N.Y., American Society of Civil Engineers, 1979. P. 31-51, ref.

An outline of the factors that may cause acceptance, rejection or misuse of a new water or sanitation scheme in a community. The suggestion is made that these behavioural factors could be identified through community participation.

Keywords: participation, pricing policy, spillage, survey, usage, women

(47)

WHITE, Alistair.

Community participation in water and sanitation;
concepts, strategies and methods.

Rijswijk, International Reference Centre for Community Water Supply
and Sanitation, June 1981. V, 180 p., ref.

Technical paper series, no. 17.

A monograph discussing different strategies for community participation programmes in water and sanitation, under different socio-political circumstances, and based on a definition of the reasons for and forms of community involvement. A ten-step scale of community participation is developed, from consultation as a minimal form of participation. Based on the contributions of various social sciences, a model for a health education programme is developed which uses a participatory and locally-specific approach based on the knowledge, behaviour and possibilities of the target groups.

Keywords: COMMUNITIES, HEALTH, SOCIO-CULTURAL ASPECTS,
education of communities, organisation of communities,
participation, training

(48) WHITE, Gilbert F., David J. BRADLEY and Anne U. WHITE.

Drawers of water;

domestic water use in East Africa.

Chicago/London, The University of Chicago Press, 1972. IVX, 306
p., ref.

A study based on field investigations in many rural and urban sites, analysing the amounts of water used by individual households and the factors affecting the use of water. Emphasis is put on health needs and associated alternative policies.

Keywords: disease, hygiene, pipeline design, public standpost
design, sources of water, usage, women

(49) RAYMANN, Lorenz A.

Experience of Community Development Department and SATA-
HELVETAS with rural water supplies as self-help projects in West
Cameroon.

In: Pickford, John and Susan Ball (eds.). Water and waste engineering in Africa; proceedings (of the) 6th WEDC Conference, 24-28 March 1980. Loughborough, Loughborough University of Technology, January 1981. P. 22-26.

A comprehensive report on self-help projects carried out in West Cameroon. All aspects are covered, from initial planning and organisation of the communities, through technical standards required and sources of finance, to setting up of local training schemes for operation and maintenance personnel. Emphasis throughout the projects was on complete community participation.

Keywords: Cameroon, government investment, gravity systems, participation, self-help, training

(50) BANNAGA, Sharaf Eldin Ibrahim.

Factors influencing domestic water use in developing countries, with
reference to Elobeid, Sudan.

In: Journal of the Institution of Water Engineers and Scientists, vol. 33, no. 6, 1979, p. 539-546, ref.

The paper gives the results of a study carried out in Sudan to try to identify a connection between the amount of water used and the living conditions of consumers. Representative households were chosen and a questionnaire used to provide data which was then statistically analysed using significance tests.

Keywords: calculations, data, data collection, statistics, Sudan

*(51) WHYTE, Anne.

Guide for the design of a national support programme for community education and participation in water supply and sanitation.

S.I., WHO International Reference Centre for Community Water Supply, April 1980. VI, 60 p., ref.

This report is designed to guide the community participation strategy at two levels. First, it describes a planning process for participation which can be dovetailed into the overall national planning for Decade programmes. Second, it includes information on the content or substance of community participation which is presented as alternative solutions to specific planning issues. It presents a series of tasks or decisions that need to be taken without specifying what the right answer will be. Instead, alternatives that have been used in one country or another are indicated in checklists.

Keywords: education of communities, participation

(52) GLENNIE, Colin.

A model for the development of a self-help water supply program.

Washington, D.C., The World Bank, Technology Advisory Group, 1982. XI, 47 p., ref.

World Bank technical paper no. 2.

Technology Advisory Group working paper no. 1.

This working paper examines the issues of manpower, training and institutional requirements in connection with a practical model for the development of self-help water supply and sanitation programmes. Included are typical job descriptions and a comparison between self-help water supply and sanitation programmes.

Keywords: MANPOWER, participation, MAINTENANCE, training, self-help

(53) WHITE, A.T.

Outline for the community education and participation component of the slow sand filtration project.

Voorburg, International Reference Centre for Community Water Supply and Sanitation, March 1978. III, 64 p.

Background paper of the international meeting on community education and participation in the slow sand filtration project, Voorburg, 29 May - 2 June 1978.

The report outlines some ideas as to what might be considered the objectives of community participation and health education in such a project. The ideas and possibilities could be useful for other water projects.

Keywords: children, disease, education of communities, hygiene, organisation of communities, participation, surveys, women

(54) WIJK-SIJBESMA, Christine van.

Participation and education in community water supply and sanitation programmes;

a literature review; 2nd rev. ed.

Rijswijk, International Reference Centre for Community Water Supply and Sanitation, December 1981. VIII, 225 p., ref.

Technical paper series, no. 12.

1st ed. March 1979.

An extensive review of over 400 publications on community participation and education in developing countries. It covers topics and methods for social studies for water and sanitation with different purposes, as well as forms and experiences in community participation in project allocation, local planning and construction, maintenance, administration and evaluation. Throughout the book attention is given to the information and training needs for a significant participation of the community in water and sanitation improvements, with a separate chapter on health education. A great demand and feedback from readers led to a second and updated edition.

Keywords: ADMINISTRATION, COMMUNITIES, FINANCIAL ASPECTS, HEALTH, MAINTENANCE, MANPOWER, PLANNING, SOCIO-CULTURAL ASPECTS, education of communities, evaluation, excreta disposal, implementation, organisation of communities, participation, rural areas, self-help, training, women

(55) MAACK, Stephen C.

Public taps;
the human dynamics of urban improvement.
In: African environment, vol. 1, no. 4, 1975, p. 93-110, ref.

A documentation of the ways in which provision of a public water supply is connected with the daily lives, social interactions and politics of the people in one ward of a suburb in Dakar, Senegal. Details of the organisation of the project are given from the initial relocation of squatters into the area and formation of local committees, to the problems of finance and usage of the taps.

Keywords: COMMUNITIES, legal aspects, organisation of communities, public standpost design, revenue collection, rural areas, self-help, Senegal, urban areas, usage, water committees, women

(56) FEACHEM, R.G.

Rural water and sanitation;
community participation in appropriate water supply and sanitation technologies; the mythology for the Decade.
In: Proceedings of the Royal Society of London, Series B, vol. 209, 1980, p. 15-29, ref.

The author discusses the two popular concepts of appropriate technology and community participation, and what he considers to be their over-rated role in the success or failure of water and sanitation programmes. He outlines other factors which he considers to be more significant

Keywords: disease, government investment, participation, training, Water Decade

(57) WHYTE, Anne.

Towards a user-choice philosophy in rural water supply programmes.
In: Les carnets de l'enfance/Assignment children, no. 34, April-June 1976, p. 28-45, ref.

Explains the concept of a user-choice approach to rural water projects, and outlines the trends towards it in technological, organisational and health education areas. Uses examples to highlight aspects of tradition, social patterns and styles of community decision making.

Keywords: SOCIO-CULTURAL ASPECTS, Iran, Mexico, organisation of communities, participation, tradition, usage

(58) WIDSTRAND, Carl (ed.).

Water and society;

conflicts in development. Part I. The social and ecological effects of water development in developing countries.

Oxford etc., Pergamon, 1978. VII, 226 p., ref.

Water development, supply and management, vol. 7.

The book comprises ten studies presented at a seminar on sociological aspects of water exploitation in developing countries. Papers included are on the social, economic and environmental implications of water development, together with planning and management in the rural sector, health aspects, and technical, design and research aspects.

Keywords: disease, evaluation, hygiene, multi-national agencies, potability, rural areas, sources of water, supervision of operation, tradition, usage, water quality, women

(59) ELMENDORF, Mary.

Women, water and waste;
beyond access.

Washington, D.C./Sarasota, Florida, M. Elmendorf, 1980. 21 p., ref.
Discussion paper for the Equity Policy Center Mid-Decade Workshop
"Women, water and waste", Mid-Decade Forum, World Conference of
the United Nations, Decade for Women, Copenhagen, July 1980.

A paper examining the impact of improved water and sanitation on
the lives of women and children, highlighting the ways in which
women can be key agents in assuring that the Water Decade targets
will have a more significant impact on all the target population.

Keywords: children, customs, disease, excreta disposal, Water
Decade, women

2.4

HEALTH

(60) Community health education in developing countries; getting started.

Washington, D.C., Peace Corps/American Public Health Association, 1978. VIII, 209 p.

Peace Corps, Information Collection and Exchange, program & training journal manual no. 8.

The manual is designed to help persons who are interested in promoting change to improve the health conditions of their communities to get started on a community health project through health education.

Parts I and II focus on fundamental health education processes. They discuss techniques and approaches for working with community members to plan and develop programmes that are responsive to the community's expressed needs and goals. Part III presents a discussion of some aids and methods in health education. Part IV deals with common community health problems including control of communicable diseases.

Keywords: HEALTH, education of communities, participation, training

(61) WOOD, W.E.

The control of water-borne epidemics (including cholera and other enteric infections) through the improvement of community water supply.

Geneva, World Health Organization, 1971. 45 p., ref.
WHO/CWS/71.1.

Simple and practical expedients are described which could be carried out by urban or rural water supply undertakings or health authorities, with a minimum of funds, skilled supervision and time to spare.

Keywords: HEALTH, chlorination, chlorination for health, disease, distribution system design, hygiene, intermittent operation, leakage, legal aspects, rural areas, sources of water, water codes, water quality

- (62) McJUNKIN, Frederick Eugene.

Engineering measures for control of schistosomiasis.

Washington, D.C., Agency for International Development, September 1970. VI, 69 p., ref.

The report gives a background description of the disease, its life cycle and occurrence, and the ecology of the snail hosts. It continues with an outline of the different control measures which can be implemented, with special emphasis on engineering, and possible areas for future research.

Keywords: HEALTH, disease, hygiene, water quality

- (63) CAIRNCROSS, Sandy and Richard G. FEACHEM.

Environmental health engineering in the tropics;
an introductory text.

Chichester etc., Wiley, 1983. XIII, 283 p., ref.

The book is concerned with engineering methods for improving the health situation of the poorest sections of the world's population and covers the following themes: water and sanitation related infections; health problems related to the chemical composition of water; water quality and standards; domestic water supplies; treatment, disposal and re-use of excreta and refuse; environmental modifications to control vector-borne diseases. Lists of references on all discussed themes are included.

Keywords: DESIGN, HEALTH, MAINTENANCE, OPERATION,
PLANNING, disease, excreta disposal, hygiene, potability,
water quality

(64) PISHAROTI, K.A.

Guide to the integration of health education in environmental health programmes.

Geneva, World Health Organization, 1975. IV, 81 p., ref.
WHO offset publication no. 20.

This guide on the essential aspects of integrating health education with environmental health is meant for use by environmental health personnel who will be primarily responsible for planning and supervising the health education components of environmental health programmes. The first part deals with methods of incorporating health education into environmental health programme planning. Part two deal with the systematic incorporation of community-oriented health education in the basic and in-service preparation of environmental health manpower. The third part deals with the introduction of environmental health teaching in the school system.

Keywords: HEALTH, MANPOWER, PLANNING, education of communities, training

(65) WERNER, David and Bill BOWER.

Helping health workers learn;

a book of methods, aids, and ideas for instructors at the village level.

Palo Alto, Cal., Hesperian Foundation, 1982. 632 p.

The book provides a collection of methods, aids, and ideas for learning to be used by instructors of village health workers and other people involved in community education. It includes approaches to planning and carrying out a training programme for community health workers and suggests ways to make learning more meaningful, useful and adventurous.

Keywords: HEALTH, education of communities, participation, self-help, training

(66) UNRAU, G.O.

Individual household water supplies as a control measure against Schistosoma mansoni;
a study in rural St Lucia.

Repr. from: Bulletin of the World Health Organization, vol. 52, 1975.
8 p., ref.

A report on a project to evaluate single control measures for reducing disease transmission by the installation of household supplies. Useful data on consumption and wastage has been compiled which suggests that future systems could be designed to be more economical and efficient.

Keywords: criteria of design, data collection, disease, house connection, pipes, PVC, recurrent costs, sources of water, spillage, St Lucia, tap design

(67) Guidelines for drinking water quality (Vol. 1)
Geneva, World Health Organization,
(Publication in 1984; Vol. 2 and 3 will follow)

The report presents guidelines for the micro-biological, chemical, physical and radiological quality for safe domestic water supply. The guidelines have been developed by WHO to describe the quality of water that is suitable for drinking purposes under all circumstances. They can serve as a basis for developing standards for water supplies in the context of prevailing environmental, social, economic and cultural conditions.

Keywords: HEALTH, water quality

(68) ANSELL, Christine and Robert BURROWES.

Training manual in elementary hygiene/education and its instruction.
Sanaa, Yemen, American Save the Children, August 1981. 111 p.

The manual contains practical information that a water technician or health worker needs to know in order to instruct villagers in water-related hygiene and sanitation. One chapter deals with aspects on community hygiene and sanitation messages to villagers.

Keywords: HEALTH, disease, education of communities, excreta disposal, participation, training

(69) McJUNKIN, F. Eugene.

Water and human health; 2nd pr.
Washington, D.C., U.S. Agency for International Development, 1983.
XIII, 134 p., ref.
Prep. by National Demonstration Water Project.
1st pr. July 1982.

The publication provides an overview of the relationship between water and human health, and covers the following themes: water and sanitation related diseases; methods for evaluating the quality of drinking water; public health effectiveness of water treatment; public health effectiveness of excreta and waste-water treatment and disposal; a review of health impact studies of community water supplies. Extensive bibliographies on all discussed aspects are included.

Keywords: HEALTH, disease, evaluation, excreta disposal, hygiene, water quality

(70) McJUNKIN, Frederick Eugene.

Water, engineers, development, and disease in the tropics; schistosomiasis engineering applied to planning, design, construction and operation of irrigation, hydroelectric and other water development schemes.

Washington, D.C., Agency for International Development, July 1975. III, 182 p., ref.

The author outlines the many implications that water resource development can have on human health, especially in the transmission of schistosomiasis. Measures are described which can be taken to help prevent the spread of this and other water-related diseases.

Keywords: HEALTH, disease

2.5 ADMINISTRATION AND FINANCIAL MANAGEMENT

- (71) SAUNDERS, Robert J., Jeremy J. WARFORD and Patrick C. MANN.

Alternative concepts of marginal cost for public utility pricing; problems of application in the water supply sector.

Washington, D.C., International Bank for Reconstruction and Development, May 1977. VI, 79 p., ref.
World Bank staff working paper no. 259.

A brief discussion of the general problems of applying marginal cost pricing is given which attempts to place the problem of capital indivisibility in a proper context. The main focus of the paper consists of an examination of several definitions of marginal cost that have been used, and to evaluate them according to their implications for: price and revenue stability, economic efficiency and revenue generation.

Keywords: COSTS, investment, rates, revenue collection

- (72) MIDDLETON, Richard N., Robert J. SAUNDERS and Jeremy J. WARFORD.

The costs and benefits of water metering.

Washington, D.C., International Bank for Reconstruction and Development, June 1977. II, 19 p., ref.
P.U. report no. PUN 29a.

Briefly states the theoretical framework for making a decision on whether or not water supply authorities should meter household water supplies. Examples are used to show how in many cases metering can be justified, but it can also occasionally be inappropriate.

Keywords: investment costs, metering, recurrent costs

- (73) DEMKE, Keith A. and Donald T. LAURIA.

Costs for supplying alternative community water and sanitation systems in Brazil.

In: Journal (of the) American Water Works Association, vol. 74, no. 4, April 1982, p. 170-177, ref.

Costs of systems that would provide different levels of water and sanitation services for a Brazilian community were analysed by using local cost data and computer techniques. At all levels of service, the cost of supplying both water and sanitation is approximately twice that of providing water alone. Of the five systems investigated, the one using yard taps and on-site waste disposal appears to be economically feasible and attractive for many communities throughout the world.

Keywords: COSTS, Brazil, calculations

- (74) SIDWELL, Lewis and Neil F. CAREFOOT.

Montserrat water authority accounting department handbook.

Bridgetown, Barbados, Pan American Health Organization/World Health Organization, 1980? V, 139 p.

Caribbean Basin Water Management Project (PAHO).

Title on cover: Accounting department handbook.

This handbook intends to serve three purposes: to provide accounting staff with a day-to-day reference document, to provide the chief accountant with a teaching aid for personnel in his department, and to provide a tool for water utility management. It presents the basic accounting procedures needed to ensure proper financial accountability for all phases of water utility activities.

Keywords: accounts

(75) CARRUTHERS, I.D.

A new approach to domestic water rating.

In: Eastern Africa economic review, vol. 4, no. 2, December 1972, p. 73-96, ref.

The paper records rating practice in Kenya at the time of publication.

The application of the economic theory of public utility rating is discussed, and recommendations made for a new policy. The conclusion arrived at is that for the widespread use of piped water to be feasible in rural as well as urban areas, subsidies are necessary.

Keywords: COSTS, FINANCIAL ASPECTS, investment costs, Kenya, metering, pricing policy, rates, recurrent costs, rural areas, scale effects, subsidy

2011?

(76) CHAPPEY, M.

Systèmes de tarification en Afrique / tariffication systems in Africa.

In: Aqua, 1980, no. 2, p. 13-26.

French/English.

A discussion of the advantages and disadvantages of standposts as opposed to service pipes from the point of view of costs to the consumer. The final section reports on information collected from many iffs, standposts and service pipes.

Keywords: Africa, house connections, metering, revenue collection, public standpost design, tariffs

- (77) WARFORD, J.J. and D. JULIUS.

Water rates in developing countries.

Washington, D.C., International Bank for Reconstruction and Development, March 1977. 9 p., ref. P.U. report no. PUN 27.

A description of the efforts made to reconcile the many objectives of pricing policy. The point is made that in some respects, water rate policy in the developed countries would do well to follow the example given by experience in the developing world.

Keywords: house connections, pricing policy, rates, tariffs

71 A1170.

- (78) TSO, Q.C.

Water supply development and charges and ratemaking for water service in Taiwan.

In: Pescod, M.B. and D.A. Okun (eds.) Water supply and wastewater disposal in developing countries; proceedings of a water supply and sanitation seminar held in Bangkok 19-23 January 1970. Bangkok, Asian Institute of Technology, January 1971. P. 253-262.

The author gives a geographical description and brief history of water supply in Taiwan. A description is given of the system of water rates used, with a breakdown of the different charges involved.

Keywords: charging policy, metering, rates, supply systems, Taiwan

2.6 TECHNICAL ASPECTS, DESIGN AND CONSTRUCTION

(79) DIAMANT, B.Z. *Oh / 04/ desk*

The appropriate technology of promoting safe water supply in Africa.
In: Aqua, 1980, no. 3, p. 0047-0049, ref.

The author advocates the use of appropriate technology to provide a mass solution to the safe drinking water problem. Emphasis is placed on minimal use of mechanical devices. Solutions should be simple and practical, and water supply and waste disposal should be developed simultaneously.

Keywords: Africa, disease, handpumps, potability, storage at home, Water Decade

(80) HOFMAN, H. *202.7 82 90*

Cost analysis of a "low cost water supply system" for rural areas.
Rotterdam, IWACO / Jakarta, Pt. Unisystem Utama, September 1982. III, 31 p.
Draft.

HOFMAN, Hans.

Low cost water treatment and distribution system (3 L/S) for rural water supply

Rotterdam, IWACO / Jakarta, Pt. Unisystem Utama, October 1982. II, 19 p.

West Java rural water supply project OTA-33-Jt.

Draft.

Two reports on the design of a prototype system for surface water treatment for village supply in Indonesia. On the basis of this design a cost analysis is made of a 3 L/S water supply system, including the treatment plant, the distribution system and the public standposts. The treatment plant consists of a chemical treatment unit, a filtration and a disinfection unit. All prices are given in Indonesian Rupiahs.

Keywords: COSTS, DESIGN, distribution systems, Indonesia

(81) LAURIA, Donald T. *u/c*

Design guidelines for low-cost water and sanitation.

S.I., s.n., 1981? 24 p., ref.

Paper presented at ASCE meeting, New York, N.Y., May 13, 1981.

A summary of some of the findings of World Bank research projects. The use of computer programmes is advocated for planning optimal schemes. Using examples, a detailed optimization of public standpost water supply systems is given, with the emphasis on upgrading over a period of time.

Keywords: criteria of design, distribution systems, optimization, pipeline design, Water Decade

? ← Hofhes ← 201 82 DE

(82) Design manual on small community water supplies.

Colombo, National Water Supply & Drainage Board/World Health Organization, January 1982. II, 157 p.

This technical paper is meant to serve as a guide for the design engineer in the preparation of preliminary engineering reports and final designs for small community water supplies. A rather big number of subjects is considered, such as: sources of supply, water treatment, design calculations and the preparation of engineering drawings.

Keywords: DESIGN, design calculation, distribution systems

- (83) LAURIA, Donald T., Peter J. KOLSKY and Richard N. MIDDLETON.

Design of low-cost water distribution systems.

Washington, D.C., International Bank for Reconstruction and Development, September 1977. II, 41 p., ref.
P.U. report no. RES 11.

Designers of water distribution systems have not had available analytical tools to test the effect on system costs of various design assumptions.

This paper presents the results of rigorous analyses of service pipe systems for several urban areas in developing countries. From these analyses, simple mathematical models are developed which permit prediction of total pipe length, average diameter and network costs, given decisions on variables such as per capita usage and spacing of public standposts or house connections. Examples are provided of the application of these equations to typical design problems.

Keywords: DESIGN, distribution systems, optimisation, pipeline design

- (84) GINN, H.W., M.W. COREY and E.J. MIDDLEBROOKS.

Design parameters for rural water distribution systems.

In: Journal (of the) American Water Works Association, vol. 58, December 1966, p. 1595-1602, ref.

A probability study of instantaneous flows and average daily demands of rural water systems, to provide a basis for prediction of requirements for a given number of houses.

Keywords: calculations, data, parameters for design, rural areas, urban areas

(85) JORDAN, Thomas D.

5139 / 201 869A

Handbook of gravity-flow water systems for small communities;

a reference manual for surveying, designing, and constructing gravity-flow water systems, with special reference to such projects as implemented by the Local Government Department of His Majesty's Government of Nepal.

Kathmandu, UNICEF, September 1980. X, 240 p., ref. (also being published by IT Publications Ltd., 1984)

This technical manual is written with the intention of collecting all the knowledge, theory, and practices necessary for the surveying, designing, and construction of gravity-flow drinking water systems for rural communities. It stresses the fundamental principles of design, illustrated with several general examples of successfully constructed structures. The material is presented in a manner that allows those of engineering and non-engineering backgrounds to readily understand.

Keywords: CONSTRUCTION, DESIGN, MATERIALS, concrete, gravity systems, pipeline design, public standpost, storage, valves

(86) LAURIA Donald T., Peter J. KOLSKY and Richard N. MIDDLETON.

Intermediate service levels in water distribution.

In: Gunnerson, Charles G. and John M. Kalbermatten (eds.). Appropriate technology in water supply and waste disposal; proceedings of a session sponsored by the Research Council of Environmental Impact Analysis of the ASCE Technical Council on Research at the ASCE National Convention in Chicago, Illinois, October 16-20, 1978. New York, N.Y., American Society of Civil Engineers, 1979. P. 107-122, ref.

The paper deals with design criteria for secondary water distribution networks. Mathematical examples are developed based on field studies, to predict the length and mean diameter of network piping for given values of system variables. This method provides a basis for decisions such as spacing of standposts, minimum network pressure and per capita flow.

Keywords: DESIGN, calculations, case study, criteria of design, distribution systems, house connections, pressure head, public standpost design, squatters

(87) BORJESSON, E.K.G.

Low cost distribution systems.

In: Water for peace. Vol. 7. Planning and developing water programs. Washington, D.C., Government Printing Office, 1971. P. 10-17.

French and Spanish abstracts.

A report on the available solutions to water supply problems in varying sizes of settlements from villages to slum areas of large towns and cities. This is followed by a case study of a village on the Paraguay river where a basic system providing water to every dwelling was planned and built very quickly.

Keywords: case study, disease, tap design, urban areas

HOFMAN, Hans.

Low cost water treatment and distribution system (3 L/S) for rural water supply.

See:

HOFMAN, H. Cost analysis of a "low cost water supply system" for rural areas.

- (88) Manual for rural water supply; 201 80115
with many detailed constructional scale-drawings; ed. and comp. by Helvetas/SATA.
St. Gallen, SKAT, 1980. V, 204 p.
SKAT publication no. 8.

A construction and design manual developed from experience in Cameroon. Useful information is given on sources, planning, field-work, design, construction, administration and maintenance of all aspects of rural water supplies. Working drawings are included for the design and construction of a public standpost and public fountain.

Keywords: CONSTRUCTION, DESIGN, MAINTENANCE, Cameroon, construction manual, data, design manual, distribution system design, gravity systems, pipe laying, public standpost design, pumping, sources of water, standpost stand construction, water quality

- (89) Manual for rural watersupply. 201 75113
Victoria/Buea, Cameroon, Ministry of Agriculture/SATA, November 1975. 248 p., ref.

A manual based on experience gained in Cameroon over more than ten years, in the planning and construction of rural water supplies. Although the information given is specific to Cameroon, it would be useful, with modifications, in other areas.

Keywords: Cameroon, data, distribution system design, pipeline design, pipes, public standpost design, sources of water, valve design

(90) DATTA, A.K.

Metric nomographs for equivalent length method of water network analysis.

In: Indian journal of environmental health, vol. 20, no. 4, October 1978, p. 390-397, ref.

The paper develops a direct and quick method of sizing mains in a water distribution network. Nomographs are developed to make calculations easier. Also included are relevant background information and direction for use of the method.

Keywords: calculations, data, distribution systems, pipes

(91) BHAVE, Pramod R.

Noncomputer optimization of single-source networks.

In: Journal of the Environmental Engineering Division, proceedings of the American Society of Civil Engineers, vol. 104, no. EE4, August 1978, p. 799-814, ref.

The method described is applicable to branched, looped and combined networks, and is illustrated by a design example. It is claimed that the method compares favourably with similar methods using computers.

Keywords: calculations, distribution systems, optimization

- (92) DEB, Arun K. and Asok K. SARKAR

Optimization in design of hydraulic network.

In: Journal of the Sanitary Engineering Division, proceedings of the American Society of Civil Engineers, vol. 97, no. SA2, April 1971, p. 141-159, ref.

The paper outlines a new method for direct least-cost solution of pipe sizes of different branches of a network. It includes a method to find the optimum inlet hydraulic head and the optimum geometry of the pressure surface. A sample problem illustrates the use of the technique.

Keywords: calculations, optimization, pipes

- (93) LUDWIG, Harvey F. and Alfred W. JORGENSEN.

Package approach for development of village water supply systems.

In: Water for peace. Vol. 7. Planning and developing water programs. Washington, D.C., U.S. Government Printing Office, 1971. P. 80-89.

French and Spanish abstracts.

The authors advocate the establishment of a standardised packaged module approach to cope with the mass design of village systems. Implementation of a program is suggested for the preparation of a series of manuals adapted for various world regions. A purely technical approach in which community aspects are not considered.

Keywords: design manual, distribution systems

201 82/112

- (94) Practical solutions in drinking water supply and wastes disposal for developing countries; 2nd rev. ed.
Rijswijk, International Reference Centre for Community Water Supply and Sanitation, September 1982. 126., ref.
Technical paper series, 20.
1st ed. February 1977.

Engineers in developing countries are presented with alternative technological solutions for water supply and waste disposal in rural areas. Local materials and skills are promoted and where possible the usefulness, disadvantages, and limitations of the techniques described are discussed.

There are sections on:

- (1) water collection from different sources,
- (2) water treatment (coagulation/flocculation, filtration, chemical dosing and iron removal),
- (3) water transport and distribution (pipes, simple pumps and waste reduction), and
- (4) wastewater and solid waste disposal (pit latrines, composting septic tanks and aqua privies).

Keywords: DESIGN

5533

- (95) Public standpost water supplies; a design manual.
Voorburg, WHO International Reference Centre for Community Water Supply, December 1979. 91 p., ref.
Technical papaer series, no. 14.

Deals with the technical and engineering aspects of the design and construction of public standposts. Included is a step-by-step design method with an example of design calculation, construction drawings and technical descriptions.

Keywords: DESIGN, public standpost design

- (96) Rural water supply. 3 vols.
Quezon City, National Water Resources Council, 1980.
Vol. I. Design Manual. XII, 168 p., ref.
Vol. II. Construction and installation manual. XIII, 241 p., ref.
Vol. III. Operation and maintenance manual. XVI, 96 p., ref.

These technical manuals are meant to be used as reference and training materials for people who will prepare design and feasibility studies, and for local engineers who will be involved in the construction and supervision of water supply systems serving a population of not more than 4000.

Keywords: CONSTRUCTION, DESIGN, MAINTENANCE, MATERIALS,
OPERATION

- (97) Rural water supply and environmental health.
Vol. six. Standard design manual; final report (to the) Republic of Ghana.
Tel-Aviv/Accra, Tahal Consulting Engineers, February 1978. 196 p., ref.
Prep. for the World Health Organization of the United Nations acting as executing agency for the United Nations Development Programme.
GHA-71/527.
GHA/PIP/001.

The manual presents guidelines, standards, instructions and procedures for use in the design and planning of rural water supply schemes, intended to help unify designs and standardise construction elements. Five standard models are presented, to represent piped and non-piped schemes.

Keywords: accessibility, chlorination, data, design manual, distribution system design, pipes, public standpost design, rural areas, sources of water, water quality

(98) WRIGHT, Forrest B.

205.2 8784

Rural water supply and sanitation; 3rd ed.
Huntington, N.Y., Krieger, 1977. XIII, 305 p.
1st ed. 1932.

Background technical information is provided, together with a practical section on such topics as making joints in steel, copper and plastic pipe, repairing taps and determining pipe sizes.

Keywords: calculations, gravity systems, joint construction, plastic, pressure head, sources of water, steel, tap design, valve design, water quality

(99) HOFKES, E.H. (ed.).

201 81587

Small community water supplies;
technology of small water supply systems in developing countries;
with contrib. from L. Huisman, J.M. De Azevedo Netto, B.B. Sundaresan, and J.N. Lanoux.
Rijswijk, International Reference Centre for Community Water Supply and Sanitation, August 1981. 413 p., ref.
Technical paper series, no. 18.

A useful handbook/source document on technology of small community water supplies. The book covers the whole range of the topic including planning and management, water quality, sources, pumping, water treatment and design of distribution systems.

Keywords: DESIGN, demand, distribution system design, drainage, house connections, public standpost design, sources of water, standpost stand construction, valve design, Water Decade, water quality

201 78523

- (100) CAIRNCROSS, Sandy and Richard FEACHEM.

Small water supplies.

London, The Ross Institute of Tropical Hygiene, January 1978. X;
78 p., ref.

Ross bulletin no. 10.

This is a booklet intended for use by non-technically trained workers in rural areas where simple improvements and equipment are needed but where materials and skills may be lacking. The authors recommend that the book should be used only for guidance in design. There are sections on sources, storage and distribution, pipes and pipelines, all with simple clear illustrations.

Keywords: DESIGN, pipes, pumping, rural areas, sources of water, storage, tap design, water quality

262.0 78523

- (101) ROYER, J. Cleveland.

Standard detail drawings - waterworks;
a job-aid.

Bridgetown, Barbados, Pan American Health Organization/World Health Organization, ± 1978. III, 29 p.

Caribbean Basin Water Management Project (PAHO).

This booklet consists of 29 drawings of standard construction details. They are intended to provide engineers, supervisors and construction foremen in water system construction with a comprehensive set of guidelines directly applicable to waterworks construction.

Keywords: CONSTRUCTION, DESIGN, pipelines, valves

(102) JOHNSON, Carl R.

Standards and procedures for the design of water supply systems in rural areas of Nepal and Bhutan;
with special reference to the projects being implemented by the Remote Area and Local Department (RA & LDDD), HMG, Nepal; 3rd rev. ed.
Kathmandu, UNICEF, April 1977. V, 100 p., ref.
1st ed. August 1975.
Title on cover: Village water systems.

This technical manual is written as a reference for persons engaged in rural water supply design and construction. The design information reflects particular design problems of small water system construction in remote hill and mountain regions. The coverage of specific topics ranges from criteria and considerations for the design of certain water system features to fully developed standard designs, estimates, and specifications for other features.

Keywords: CONSTRUCTION, DESIGN, gravity systems, pipeline design

201 76757

(103) Typical designs for engineering components in rural water supply.
New Delhi, World Health Organization, Regional Office for South-East Asia, 1976. 39 p. drawings with explanatory text.
WHO regional publications, South-East Asia series, no. 2.

Technical drawings are given for all components of water supply systems. In particular, two types of public standpost are illustrated.

Keywords: CONSTRUCTION, standpost stand construction, storage tank construction

- (104) FAIR, Gordon Maskew, John Charles GEYER and Daniel Alexander OKUN.

Water and wastewater engineering.

Vol. 1. Water supply and wastewater removal.

New York, N.Y., etc., Wiley, 1966. IX, 505 p., ref.

A basic text on water supply and wastewater disposal as an engineering science. Useful for fundamental principles and has a good section on basic optimization techniques, together with a comprehensive general bibliography.

Keywords: DESIGN, distribution systems, optimization, sources of water, storage, urban areas

- U 955
- (105) Water project operator field handbook;
with an introd. by H.P.J. van Schaik.
Lilongwe, Malawi, Department of Lands, Valuation & Water, May 1982. 109 p.

This draft is intended for use by officers in charge of self-help piped water projects. It was produced as a record of techniques developed from experience in Malawi.

Keywords: gravity systems, joints construction, Malawi, participation, pipe laying, pipeline design, self-help, storage tanks, valve design, water committees

(106) BABBIT, Harold E., James J. DOLAND and John L. CLEASBY.

Water supply engineering; 6th ed.

New York, N.Y., etc., McGraw-Hill, 1967. VII, 672 p., ref.

McGraw-Hill series in sanitary science and water resources engineering.

This is a basic text book, giving technical information on design and construction of water a distribution system and its integral parts, together with sections on water quality and treatment. The theory mainly applies to large-scale urban distribution systems, but would also be useful for small-scale public water supply systems.

Keywords: corrosion, distribution systems, leak detection, meter design, pipelaying, pipeline design, pipes, sources of water, storage, valve design, water quality



Photo: IRC / R. Brasseur

2.7 MATERIALS, PARTS AND EQUIPMENT

472

262 7873

- (107) STERNBERG, Yaron M. and Robert KNIGHT.

Final report on the development and testing of the Robovalve.
College Park, Maryland, University of Maryland, International Rural
Water Resources Development Laboratory, June 1978. IV, 70 p.
Prep. for the U.S. Agency for International Development.
AID contract AID/ta-c-1461.

A report on the development and testing of the Robovalve for wear and leakage. Three project designs were proposed, for public hydrant/standpost, household/yard tap and a tap for plastic water containers. The report contains working drawings and photographs of the Robovalve.

Keywords: leakage, public standpost design, tap design, valve design

263 7873

263 7873

- (108) STERNBERG, Yaron M. and Robert KNIGHT.

Final report on the development of the Robometer.
College Park, Maryland, University of Maryland, International Rural
Water Resources Development Laboratory, January 1979. VI, 55 p.
Prep. for the U.S. Agency for International Development.
AID contract AID/ta-c-1460.

A report on a project to develop a non-proprietary, individual house, user activated water meter which is inexpensive, low in operating and maintenance costs, and easily produced in most developing countries. Includes working drawings and photographs.

Keywords: meter design

(109) PIPER, James D.

New developments in cement use for water facilities.

In: Water for peace. Vol. 7. Planning and developing water programs. Washington, D.C., U.S. Government Printing Office, 1971. P. 69-79.

French and Spanish abstracts.

The paper has comprehensive sections on the use of concrete in dam construction, water storage facilities, irrigation canal linings and pipes. There is a summary of the qualities of concrete as a material for use in water projects, together with the important factors in attaining good concrete for the appropriate purpose.

Keywords: concrete, storage tank construction

468

262.1 78PI 9

(110) Pipes and conduits in water supply and waste water conveyance.

Bombay, Victoria Jubilee Technical Institute, October 1978. III, 129 p., ref.

Lecture notes.

A selection of papers dealing with materials, design, manufacture, installation, corrosion and maintenance of pipes used for both water supply and wastewater disposal.

Keywords: MATERIALS, concrete, corrosion, pipe laying, pipes, plastic, valves

1650

202.1 6g P80

- (111) McJUNKIN, Frederick E. and Charles S. PINEO.

Role of plastic pipe in community water supplies in developing countries; repr.

Washington, D.C., Agency for International Development/U.S. Government Printing Office, 1971. VIII, 130 p., ref. 1st pr. 1969.

Included is a discussion of the uses and manufacture of plastic pipe, with standards and codes for manufacture, methods of manufacture and marketing. Useful appendices are a bibliography, glossary and directory of manufacturers.

Keywords: MATERIALS, joint construction, manufacture, pipe laying, pipeline design, pipes, plastic, PVC, valve design

- (112) HOFMAN, H.

201 82 VA,

Value analysis of materials used in rural water supply systems; progress report.

Jakarta, Pt. Unisystem Utama / Rotterdam, IWACO, September 1982. 32 p. Draft.

In this paper an exercise is made to show the potential of socio-economic selection criteria in recognizing materials apt for use in rural water supply systems. The analysis showed that for civil structures, ferrocement and plastics have a big potential, while for piped systems emphasis has to be laid on hose tubes for house connections and high density polyethylene (HDPE) for distribution system piping.

Keywords: MATERIALS, distribution systems

(113) KEMPLAY, J. (ed.). 262.1 800A

Valve users manual;

a technical reference book on industrial valves for the control of fluids.

London, Mechanical Engineering Publications, 1980. 103 p.
Publ. for the British Valve Manufacturers' Association.

The manual provides information on design aspects and features of commonly used valves, together with background data on many other aspects associated with valve selection and use. Also included are Flow Data Conversion Tables and SI Units for easy reference.

Keywords: valve design

(114) MORGAN, John. V 342g

Water pipes from bamboo in Mezan Teferi, Ethiopia.

In: Appropriate technology, vol. 1, no. 2, 1974, p. 8-10.

A report on the use of bamboo water pipes in irrigation and human consumption. A useful section on the construction of a special drill for removing the inter-nodes from bamboo stems, together with drilling, installing the pipeline and measuring the flow. All techniques used are simple and the emphasis is on the full use of local materials.

Keywords: MATERIALS, bamboo, Ethiopia, pipeline design, pipes

2450/1108

804 T 81.

(115) HEUVEL, Kick van den.

Wood and bamboo for rural water supply;
a Tanzanian initiative for self-reliance.
Delft, Delft University press, 1981. IX, 76 p., ref.

The book deals with some of the results of the Iringa wood/bamboo project in Tanzania, to investigate the possibilities of bamboo and wood as materials for pipes in rural water supplies. A major part of the report is concerned with the efforts made to find a cheap and effective preservative against termites and rot.

Keywords: MATERIALS, bamboo, estimation costs, joints, lining, participation, pipelaying, pipeline design, pipes, water quality, wood

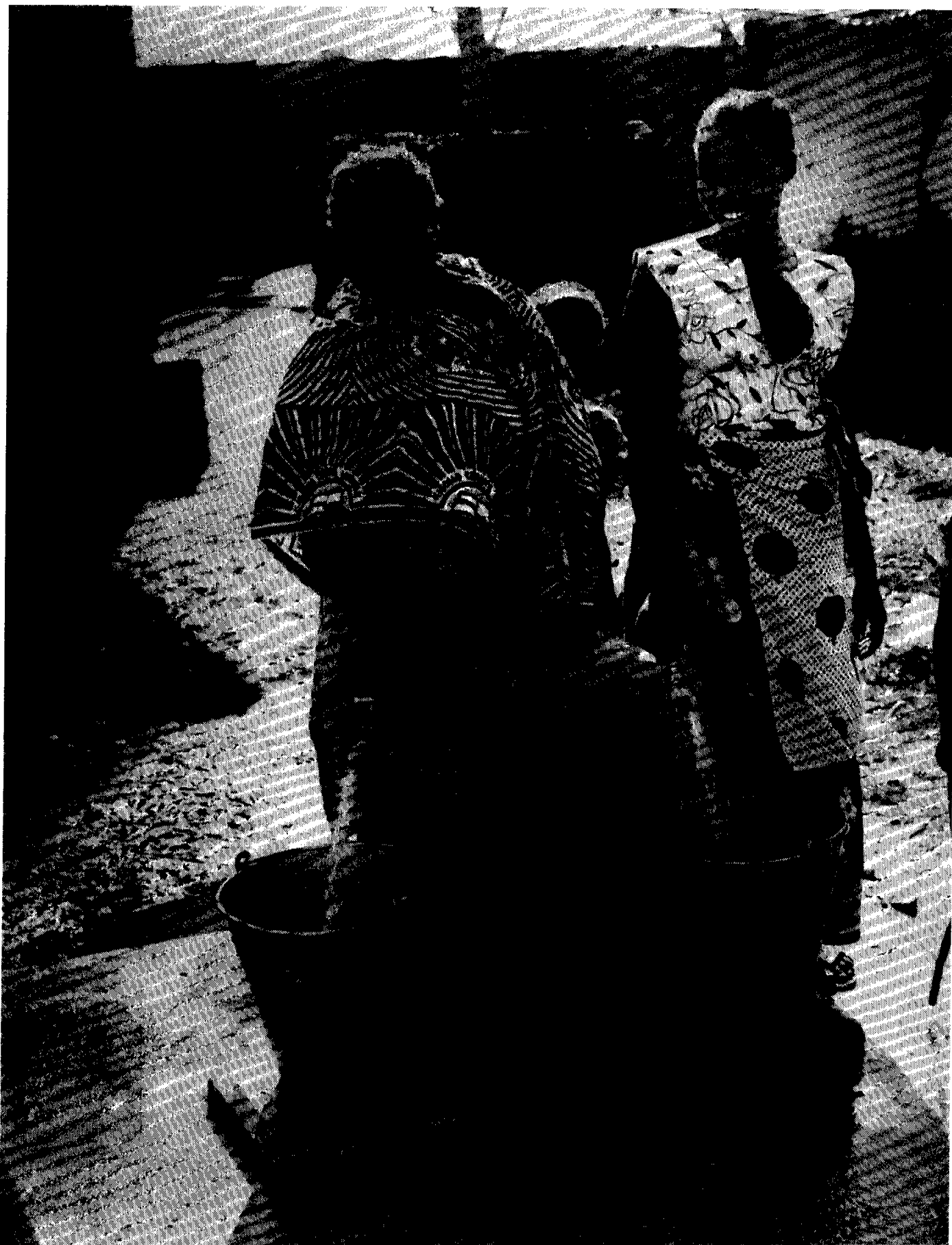


Photo: Hannes Wallrafen

2.8 OPERATION AND MAINTENANCE

851 ?
(116) RAMAN, V.

Assessment and control of leakages in distribution systems; case studies in India / Evolution et contrôle des fuites dans les systèmes de distribution; études de cas en Inde.
In: Aqua, 1978, no. 4, p. 43-51.
English/French.

A summary of the needs, techniques used, findings and cost-benefit aspects of preventive measures suitable for water distribution systems in India. Results are given of pilot field investigations carried out by NEERI since 1971 on feasibility and efficacy of surveys, detection and control of leakage in systems.

Keywords: MAINTENANCE, data collection, India, leakage, leak detection, preventive maintenance

(117) HUDSON, William D. 91

Increasing water system efficiency through control of unaccounted-for water.

In: Journal (of the) American Water Works Association, vol. 70, no. 7, July 1978, p. 362-365, ref.

1978
A discussion of the metered ratio as a measure of the efficiency of water supply systems. The author also shows how to locate and deal with sources of unaccounted-for water.

Keywords: leak detection, metering, meter design

- (118) Leak detection.
Journal (of the) American Water Works Association, vol. 71, no. 2,
February 1979, 76 p., ref. (special no.)

P. 51

This entire issue is devoted to the topic of leak detection. Papers are included on modern methods, costs and benefits of leak detection programmes, together with a state-of-the-art review.

Keywords: leak detection, recurrent costs, waste reduction

- (119) ACHESON, M.A.

A plan for preventive maintenance of rural piped water supply systems.

In: Improvement and maintenance of existing water supply systems; report on a Government of India/WHO seminar, Kanpur, Uttar Pradesh, 31 October - 4 November 1977. New Delhi, World Health Organization, Regional Office for South East Asia, May 1978. P. 99-115.

The objective of the seminar was to review managerial procedures and technological intervention in the operation and maintenance of existing water supply systems with a view to securing improved efficiency in the operation of the systems. This includes the use of new technologies to increase the performance of water treatment processes and operations.

Keywords: COSTS, MAINTENANCE, chlorination, distribution systems, leakage

262.0

(120) Preventive maintenance of water distribution systems;
course manual. 3 vols.

Nagpur, Central Public Health Engineering Research Institute,
1971-1972.

World Health Organisation project no. India 0176.03, Bombay.

- I. Field studies of distribution systems; principles and instrumentation. II, 64 p.
- II. Waste control; principles, equipment, methods, economics, planning, and procedures. II, 137 p., ref.
- III. Biological assessment and engineering control measures. III, 96 p.

Conceived in collaboration with the Water Research Association.

The manual describes the basic principles and reviews the accuracy of equipment and instrumentation for the provision of data for calculations and evaluation of water distribution systems. Also, a method is presented for determining hydraulic resistance and errors associated with the calculations are considered.

Keywords: MAINTENANCE, calculations, chlorination, data, data collection, leak detection, preventive maintenance, water quality

2.9 TRAINING AND MANPOWER DEVELOPMENT

204 80645
(121) FLANAGAN, Donna R.

A guide for training manual developers;
with contributions by John H. Austin and Quincy Francis.
Bridgetown, Barbados, Pan American Health Organization/World
Health Organization, August 1980. III, 192 p.
Caribbean Basin Water Management Project (PAHO).

A manual developed as a guide for the development of good instructional materials. These are considered necessary for the achievement of a systematic development of attitudes, knowledge and skills needed for an individual to successfully carry out a task or job. A step-by-step guide to the creation of a training manual is given.

Keywords: MANPOWER, education of manpower, evaluation, training

(122) CLEMENS, Bruce. U 212

Paraprofessionals for rural potable water supply systems;
a case study: Agua del Pueblo.
Chimaltenango, Guatemala, Agua del Pueblo, August 1978. VII, 55
p., ref.

The author outlines the role of intermediate-level technicians in planning, designing and carrying out a suitable rural potable water supply system. An outline of the skills needed and suitable training programmes is given.

Keywords: potability, rural areas, training

71 IDRC 80

- (123) Rural water supply in developing countries;
proceedings of a workshop on training held in Zomba, Malawi, 5-12
August 1980.
Ottawa, IDRC, 1981. 144 p.

The emphasis in most papers is on manpower and low-cost technology in east and southern Africa. There are sections on technology, operation and maintenance and training of personnel. Handpumps and wells are given most attention, but there are also papers on gravity systems and community self-help schemes which would be useful.

Keywords: MAINTENANCE, MANPOWER, OPERATION, Botswana, education of communities, education of manpower, Ethiopia, gravity systems, Kenya, Malawi, participation, rural areas, surveys, Swaziland, Tanzania, training, Water Decade, women

204 8210

- (124) Training for trainers;
an instruction manual.
Jakarta, Government of Indonesia, Directorate General Cipta Karya (Housing, Building, Planning, and Urban Development), 1980? 132 p.
Prep. by Manpower Development Programme for Community Water Supply Indonesia, Jakarta, in cooperation with the International Reference Centre for Community Water Supply and Sanitation, Rijswijk.

A manual to teach people how to train others, and how to set up a strong and effective training system. It is designed for a wide audience, ranging from the supervisor who needs to learn something about instruction techniques to be able to teach his men, to the person with region-wide responsibilities for manpower development.

Keywords: MANPOWER, manpower training

(125) TURRELL, R.P.J. and A.D. RANCE. 4673

Training for water supply and sanitation projects in developing countries.

In: Progress in water technology, vol. 10, no. 5/6, 1978, p. 1231-1235, ref.

The authors explore some problems encountered in training of this type, especially for rural areas, and make recommendations for future action. Basis development programmes are described which are associated with a critical appraisal of manpower requirements so that suitable training strategies and methods can be used.

Keywords: education of communities, manpower requirements, participation, rural areas, training, urban areas

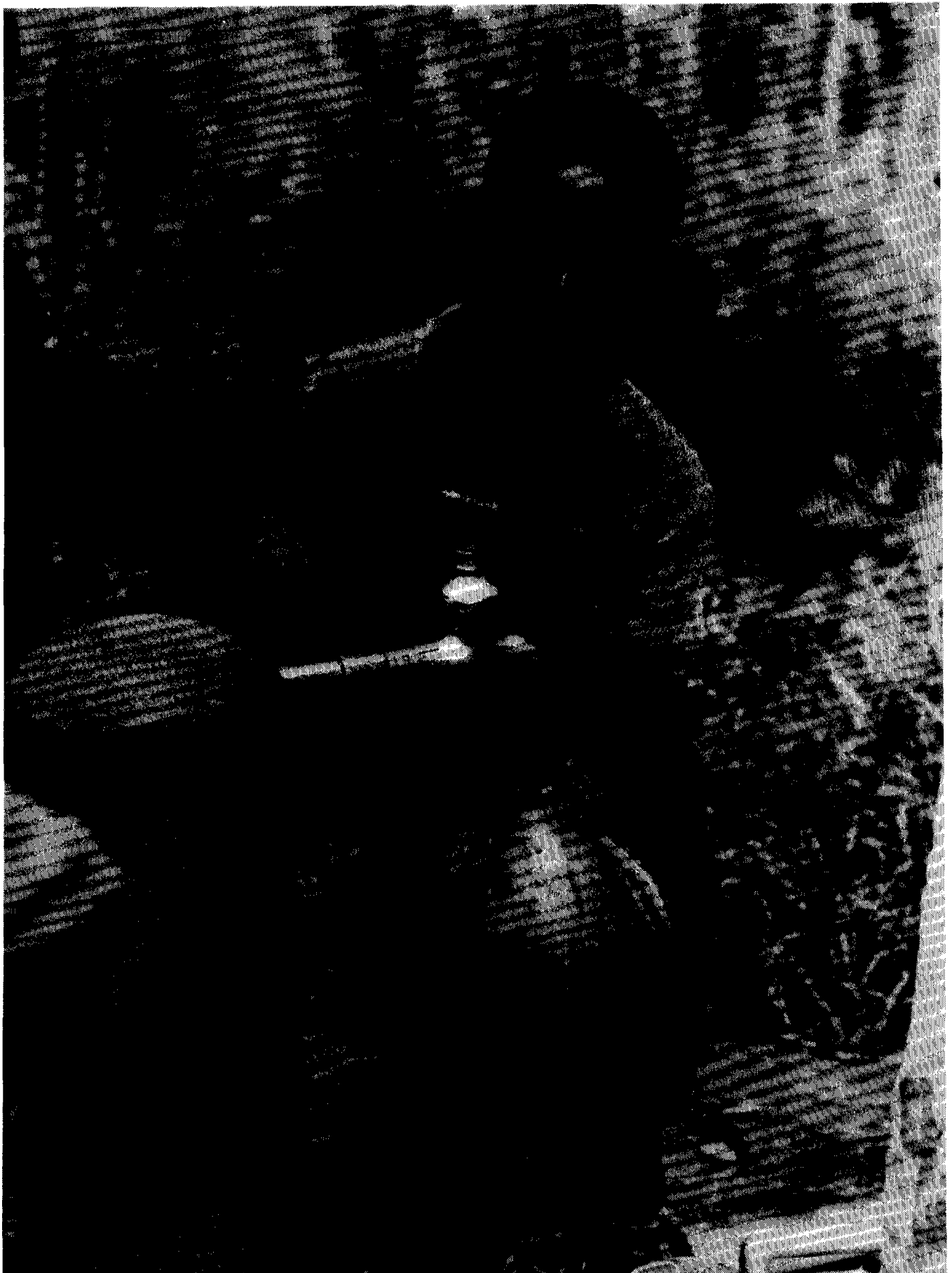


Photo: Zafar

2.10 COUNTRY STUDIES

- (126) KARP, Andrew W. and Stephen B. COX.

Building water and sanitation projects in rural Guatemala.

In: Journal (of the) American Water Works Association, vol. 74. no. 4, April 1982, p. 162-169, ref.

A nonprofit technical assistance organisation has successfully developed rural water and sanitation projects in remote mountain villages in Guatemala. Essential parts of the programme include appropriate technologies, village participation, self-financing, village-managed operation and maintenance, and use of paraprofessional rural water technicians.

Keywords: COSTS, participation, excreta disposal, Guatemala, manpower education, manpower training, self-financing

- (127) SHOUVANAVIRAKUL, Paichayon.

Demand for potable water in small communities of Thailand.

Bangkok, Asian Institute of Technology, 1970. VII, 85 p., ref. AIT thesis no. 341.

A study with the emphasis on determining the need for potable water in small communities of Thailand and the delineation of the factors affecting water demand. Several factors were taken into account, these being hours of availability of water through the distribution system, type of water service connection, price of water, season of the year, water quality, and socio-economic status of the community.

Keywords: demand, Thailand

(128) CRAWFORD, M.A.

Domestic point and long cattle trough in Kilimanjaro, Tanzania.

In: Warner, Dennis (ed.). Rural water supply in East Africa; proceedings of the workshop on rural water supply Dar es Salaam, 17 - 19 December, 1969. Dar es Salaam, University College, May 1970. P. 143-146.

BRALUP research paper 11.

This paper contains a study on the pattern of use of public standposts in Tanzania and of the items affecting this pattern. A minor study was also made of a cattle trough, where information was collected relating to cattle, sheep and goats.

Keywords: Tanzania, usage

(129) BHARIER, Julian.

Improving rural water supply in Malawi.

In: Finance and development, September 1978, p. 34-36.

The paper examines a successful self-help programme for rural water supply improvement, using gravity schemes as a low-cost alternative to boreholes. It outlines the setting up of the scheme from the initial forming of local committees through financing and construction to training for maintenance of the completed system.

Keywords: gravity systems, Malawi, pipeline design, rural areas, self-help, sources of water, water committees, women

- (130) BORJESSON, E.K.G. and Carlos M. BOBEDA.

New concept in water service for developing countries.

In: Journal (of the) American Water Works Association, vol. 56, no. 7, July 1964, p. 853-862.

A report on three small areas in Paraguay where improvements in public health and social conditions were brought about with the introduction of a simple, single pipe supply line to serve a group of houses, each of which was provided with a waste-reducing tap.

Keywords: distribution system, evaluation, Paraguay, tap design, waste reduction

- (131) ANYAHURU, E.A.

Pipe-borne water supply in a traditional society;
Nigerian condition.

In: Pickford, John and Susan Ball (eds.). Water and waste engineering in Africa; proceedings (of the) 6th WEDC Conference, 24-28 March 1980. Loughborough, Loughborough University of Technology, January 1981. P. 102-106, ref.

A paper outlining problems associated with government policy, administration and funding of water supply projects in Nigeria, where the complexity of local conditions have made it very difficult to produce economically successful designs. A basic outline of design procedure is presented, where it has been used with some success. Emphasis is placed on the need for government help, since most communities cannot finance projects alone.

Keywords: Nigeria, organisation, parameters for design, rural areas, self-help, sources of water, urban areas

- (132) DUNCAN, J.W. Kwamina.

Survey of public standpipes systems in Kenya;

(notes on field visits 27 April - 3 May 1975).

Nairobi, University of Nairobi, Department of Civil Engineering, May 1975. 1, 7 p.

WHO project Kenya HMD 004.

A series of notes based on short field trips to some towns in Kenya to try to assess the position of public standpipes there. The author deals with financial aspects, types of system in operation with both ordinary taps and self-closing valves, pricing policies and methods of payment.

Keywords: bilateral agencies, Kenya, metering, pricing policy, public standpost design, rates, revenue collection, rural areas, squatters, tap design, valve design

- (133) MSUKWA, L.A.H. and B.F. KANDOOLE.

Water by the people;

an evaluation of the rural water supply programme in Zomba District. S.I., University of Malawi, Centre for Social Research, December 1981. VI, 128 p., ref.

This report is a study on the socio-economic effects on improved water supply on the rural population. Four topics were evaluated: water collection and water use, the examination of water collection activities in terms of various sociological patterns, the role of the community in maintenance and repair, and the effects of the improved water supply on the local economy.

(Zomba East is served by one of the largest rural piped water schemes in Malawi, whereas Zomba South is a proposed water project area.)

Keywords: case study, participation, evaluation, Malawi, public standpost design, rural areas

(134) KRUIJFF, G.J.W. de.

Water supply improvements for upgrading areas;

with special reference to automatic self-closing taps; repr.

Nairobi, University of Nairobi, Housing Research and Development Unit, February 1980. III, 31 p., ref.

1st pr. May 1979.

This report looks into the possible improvements in the upgrading of water supply for low-income communities in Kenya. The relationship between the amount of water consumed and the individual's health is examined. Attention is given to the "Fordilla" valve, a special self-closing tap. (see 130)

Keywords: COSTS, HEALTH, participation, Kenya, tap design, valve design

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Asbestos cement	- MATERIALS
Bamboo	- MATERIALS
Bilateral agencies	- PLANNING
Brass	- MATERIALS
Calculations of design	- DESIGN
Case studies	- COUNTRIES
Cast iron	- MATERIALS
Charging policy	- FINANCIAL ASPECTS
Children	- SOCIO-CULTURAL ASPECTS
Chlorination	- OPERATION
Chlorination for health	- HEALTH
Clay	- MATERIALS
COMMUNITIES	- COMMUNITIES
Concrete	- MATERIALS
CONSTRUCTION	- CONSTRUCTION
Corrosion	- MAINTENANCE
COUNTRIES	- COUNTRIES
Criteria of design	- DESIGN
Customs	- SOCIO-CULTURAL ASPECTS
Data of design	- DESIGN
Data collection	- PLANNING
Demand	- DESIGN
DESIGN	- DESIGN

Disease	- HEALTH
Distribution systems	- DESIGN
Drainage	- DESIGN
ECONOMICS	- ECONOMICS
Education	- COMMUNITIES
	- MANPOWER
Ergonomics	- DESIGN
Estimation of costs	- COSTS
Evaluation	- PLANNING
Excreta disposal	- HEALTH
FINANCIAL ASPECTS	- FINANCIAL ASPECTS
Galvanised iron	- MATERIALS
Government investment	- ECONOMICS
Gravity systems	- DESIGN
GRP (Glass Reinforced Plastic)	- MATERIALS
Handpumps	- ECONOMICS
HEALTH	- HEALTH
House connections	- DESIGN
	- ECONOMICS
Hygiene	- HEALTH
Implementation	- PLANNING
Intermittent operation	- OPERATION
Investment	- COSTS
Joints	- CONSTRUCTION
Leak detection	- MAINTENANCE
Leakage	- DESIGN
Legal aspects	- ADMINISTRATION
Lining	- MAINTENANCE

MAINTENANCE	- MAINTENANCE
Manual	- CONSTRUCTION
	- DESIGN
	- OPERATION
MANPOWER	- MANPOWER
Manufacturing	- PLANNING
MATERIALS	- MATERIALS
Metering	- ECONOMICS
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Meters	- DESIGN
Monitoring	- OPERATION
Multi-national agencies	- PLANNING
Nylon	- MATERIALS
OPERATION	- OPERATION
Optimisation	- DESIGN
Organisation	- ADMINISTRATION
Organisation of communities	- COMMUNITIES
Parameters	- DESIGN
Participation	- COMMUNITIES
Pipe laying	- CONSTRUCTION
Pipeline design	- ECONOMICS
Pipelines	- DESIGN
Pipes	- DESIGN
PLANNING	- PLANNING
Plastic	- MATERIALS
Potability	- HEALTH
Pressure head	- DESIGN
Preventive maintenance	- MAINTENANCE
Pricing policy	- FINANCIAL ASPECTS
Public standpost	- DESIGN
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Revenue collection	- FINANCIAL ASPECTS
Revolving funds	- FINANCIAL ASPECTS
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Rurban areas	- PLANNING
Scale effects	- ECONOMICS
Self-financing	- FINANCIAL ASPECTS
Self-help	- COMMUNITIES
Siting	- HEALTH
SOCIO-CULTURAL ASPECTS	- SOCIO-CULTURAL ASPECTS
Sources of water	- DESIGN
Spare parts	- MAINTENANCE
Spillage	- SOCIO-CULTURAL ASPECTS
Squatter areas	- PLANNING
Squatters	- SOCIO-CULTURAL ASPECTS
Statistics	- PLANNING
Standpost stands	- CONSTRUCTION
Steel	- MATERIALS
Stock keeping	- OPERATION
Storage	- DESIGN
Storage at home	- HEALTH
Storage tanks	- CONSTRUCTION
Subsidy	- FINANCIAL ASPECTS
Supervision	- OPERATION
Supply systems	- PLANNING
Surveys	- COMMUNITIES
Taps	- DESIGN
Tariffs	- FINANCIAL ASPECTS
Tradition	- SOCIO-CULTURAL ASPECTS
Training	- MANPOWER

Urban areas	- PLANNING
Usage	- SOCIO-CULTURAL ASPECTS
Valves	- DESIGN
Waste reduction	- DESIGN
Water codes	- ADMINISTRATION
Water committees	- COMMUNITIES
Water Decade	- PLANNING
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AGENCY FOR INTERNATIONAL DEVELOPMENT

See:

U.S. Agency for International Development

AGUA DEL PUEBLO,
41 Calle 5-01,
Zona 8,
Guatemala,
Guatemala, C.A.

or:

3421 M Street, N.W., No. 333,
Washington, D.C. 20007,
U.S.A.

AMERICAN SAVE THE CHILDREN

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