Thirsty third world

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A report of the NWC Conference held in London on 27 January 1981 to support the start of the Water Decade 1981-1990

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THE MAIN SPEAKERS:

The Rt. Hon. Tom King, MP,	Minister for Local Government and Environmental Services
Dr. Peter G. Bourne,	Assistant Secretary-General, United Nations Development Programme and Coordinator for the Decade
Dr. Richard Feachem,	Ross Institute of the London School of Hygiene and Tropical Medicine
Mr. J. Ian Waddington,	Director, Environmental Health, European Office, World Health Organisation
Mr. John R. Kalbermatten,	Water and Wastes Adviser, World Bank
Mr. Cornelis van der Veen,	Chairman, Committee for Cooperation in Development, International Water Supply Association
Mr. Brian Bennell,	Principal Engineering Adviser, Overseas Development Administration
Mr. Frank Judd,	Director, Voluntary Service Overseas
Baroness White,	Chairman, House of Lords Select Committee on European Community; President, National Council of Women (Wales)
Dr. Conor Cruise O'Brien,	Editor-in-Chief, The Observer
Sir Robert Marshall, KCB, MBE,	Chairman, National Water Council

CONFERENCE REPORT

IN MANY developing countries, poor and inaccessible water supply and unsatisfactory waste disposal sustain a vicious circle of poverty, chronic ill-health, low productivity, and high infant mortality. A Decade of effort now inaugurated by the United Nations aims to break this circle by the spread of better water and sanitation for hundreds of millions of families. By its pride in the benefits Britain has gained from good water services for a century or more, the UK industry sees itself as motivated to help this Decade energetically. It has skills and experience for this task, and the example of voluntary bodies such as OXFAM and Voluntary Service Overseas who already have teams working on water projects for some of the poorest people in the world.

The Decade is as much concerned with mobilising social and political commitment as with solving technical problems. British people have bought far more copies of the Brandt Report than have been sold in West Germany or France: for such a practical campaign as the Decade, strong support from ordinary people is very likely to be forthcoming once they are informed of its purposes and requirements.

Thus the professionals in water and the millions of British people who use the services provided by them have a remarkable opportunity: to make common cause for the benefit of a Third World thirsty for better health and less burdensome life-styles through better water supply and sanitation.

These were key points in a one-day conference held on 27 January 1981 at the Scientific Societies Lecture Theatre in London to mark the start of the International Drinking Water Supply and Sanitation Decade 1981-1990. As Chairman of the National Water Council which organised the conference, Sir Robert Marshall left those attending in no

doubt of his conviction that the UK industry should grasp the opportunities which the Decade offered, and his readiness to lead them in doing so. Peter Bourne, speaking for UNDP as lead agency for the Decade, welcomed this initiative very positively for itself and as one which the water industries or other developed nations might follow.

Tom King made clear it had the full support of the British Government. If confirmation were needed of the wide range of interest which the Decade can attract, this was evident in the 170 people at the conference coming from consulting engineers, charities, universities, trade unions, women's organisations, politics, press and television.

The need for the decade

OPENING the conference, Tom King recognised at once the issue of poverty as central. 'The Decade accords totally with the Government's policy of seeking to relieve poverty in the developing world'. He also highlighted training as 'the basis from which any country acquires the skills to help itself' and as a matter in which Britain could offer a special contribution.

Peter Bourne put the organisation of the Decade in context. Growing out of the Habitat Conference in Vancouver (1976) and the Water Conference at Mar del Plata (1978), it was now being conducted by most of the UN agencies through their own programmes and under the coordination of UNDP. The UNDP resident representatives in each developing country had to encourage internal government programmes there and engage the support of other nations and agencies with aid programmes or other relevant resources.

"We in the water industry felt that the launching of the International Drinking Water and Sanitation Decade is something very close to us, not remote or separate."

Sir Robert Marshall, welcoming those attending the Conference

But the scale of the task itself is not so easy to get into perspective. The numbers of people without wholesome water or sanitation are such that every single day from now till 1990, improvements need to be brought to another half-million of them. To serve everyone by 1990 may not be wholly achievable, but in countries where this was not done, Dr. Bourne said 'we will have to set in motion an irrevocable process so that whether it is five years beyond the Decade or ten, it will be absolutely certain that complete coverage will be achieved'. The response was already exceeding expectations. The UN General Assembly meeting held on 10 November 1980 in New York to inaugurate the Decade (a mark of priority accorded to no other campaign of this sort) had been expected by some not to last beyond lunch-time; in the event so many nations wanted to express direct explicit support that the meeting continued till 8 pm.

Speaking for WHO, Ian Waddington said that at any one time the number of people suffering from diarrhoea was about twice the population of Britain. The numbers suffering from some other water- related diseases was estimated as follows:

Malaria	160million
Trachoma	500million
Bilharzia	200million
Elephantiasis	250million

Providing better water and sanitation could pull down most of these disease levels by 50 per cent or more, and virtually eliminate the parasitic infections such as guinea worm. The aims of the Decade would not fail to be achieved for lack of resources or technology. The cost could be met and the knowledge was available. Provided it did not flounder, 'this ten years' work could be one of the greatest things in the history of this planet': but to achieve that scale of progress, Ian Waddington insisted that the grass- roots involvement of every community was crucial. Their continuing effort would be essential: without it, no grand design would produce solid lasting results. As Peter Bourne also put it, the Decade calls for 'a massive transfer of technical expertise and knowledge' but also requires us 'to build a social movement on a global scale'.

"On behalf of the Government, we welcome the Decade and UK participation in it. We do recognise that we all live in one world in which we have an acute self-interest in the survival, health and happiness of our fellow-inhabitants on this planet."

Rt. Hon. Tom King, opening the Conference

Later in the discussion Frank Judd pointed to the risk of development becoming a spectator sport; we must not delude ourselves it can be painless for us. Millions of people to be helped were very poor. Changes in their life-time habits can only happen gradually. The rich countries had to find the necessary resources. If the world economic order broke down, the rich countries would not necessarily find themselves able to cope while the developing world went to the wall, as was often assumed. Regardless of the pain and cost, the tasks which the Decade presented now as priorities were compelling. He hoped we would not be ashamed of talking about the moral dimension.

One point raised in discussion was the effect of success in the Decade on the world population problem. In reply, both Peter Bourne and John Kalbermatten saw the success of the Decade as essential to stablising world population. At present, many communities see a quarter of their children dying before the age of five. So long as they expect this, they have more children to allow for it. 'Birth-rates fall once people are reasonably confident that most of their children will survive - the evidence is clear and incontrovertible'.

Water and sanitation and women

RICHARD FEACHEM took the audience on a world tour, in slides, of appalling water supply and waste disposal and of improvements achieved. But he was at pains to emphasise that with water and sanitation it was crucial also to deal with behaviour. To neglect any of the three would likely make work done on the others abortive.

There were problems of water quantity and of quality. Wnere water has to be fetched and carried a long distance, very little is used for personal hygiene. Te effect of inaccessibility was therefore serious in many ways. But accessible sources were liable to be used crudely for many purposes, washing, defecating, drinking. He showed slides of wells with no rim so that the drainage actually ran into them: pools used for water supply where the water bacteriologically is of about the same quality as a mild British sewage.

In rural areas the problems are intractable on account of poverty and the areas over which populations have to be provided for. Drainage or latrine systems are widely non-existent. But in urban areas the sheer crowding of people is at least as intractable. Brian Bennell spoke of urban systems built with substantial capital already being unusable within 15 to 20 years for lack of maintenance. John Kalbermatten responded to questions about the low-cost technology being inappropriate in densely crowded urban areas but sophisticated technology being beyond the skills and resources of the community. There was no easy or general answer, but the scope for modest technology to provide good sanitation in cities must not be under-rated.

Problems of behaviour and social adaptation got repeated mention, along with references to community involvement. Peter Bourne said that people's willingness to use a new system has to be gained. Health education programmes were a vital part of the Decade projects. Obstacles such as Thai villagers disliking water from pipes lacking the flavour of the pools frequented by buffalo had to be overcome patiently for real progress to be lasting.

Among the social changes prominent in the Decade's consequences the largest may well be the release of women from the endless drudgery of collecting water -- sometimes

"Half of all the hospital beds in the world are occupied by people with water-related diseases (Peter Bourne). *The potential of safe water and sanitation as a preventive medical tool is obvious* (Ian Waddington). *"*

after digging for it -- and carrying it home. There are many places where children have to join in this arduous work also. Speaking as Chairwoman of the National Federation of Women's Institutes, Mrs Patricia Batty Shaw expressed their support for the Decade and that of the Associated Country Women of the World. The effect on the family, especially in rural areas, of the present situation and the potential benefits from improvements gave a message which everyone in the developed world could grasp.

This was reinforced by Professor David Bradley speaking briefly from the audience. Apart from the children who did not survive, much grievous harm came from the recurring attacks of diarrhoea and other illnesses weakening permanently those who did survive. He showed graphs of how little they grew in weight as children. That sort of weakness could not be put right later, and their strength as adults would be permanently impaired -- for lack of good water and sanitation in childhood.

Resources for the Decade: manpower and training

THE CONFERENCE moved from discussion of the needs and problems of the Decade to the resources and actions required to make an effective response to them. In total the cost might appear forbidding on its own - perhaps

"Clean accessible drinking water and sanitation for all would have a dramatic impact on the economic status of the world's billion people who live in absolute poverty. Healthy people are productive people and productive people are the key to economic development ..... if one is looking for a starting point to make the recommendations of the Brandt report happen, this is the point to look."

Peter Bourne

$300billion to provide adequate water and sanitation for 80 per cent of the people through the lowest cost technologies appropriate in various settings. But the cost of the Decade deferred would be even higher, in suffering, low output, health care repeatedly frustrated by poor water once more spreading and sustaining disease. Moreover, for the whole of Bangladesh the cost of three fighter planes would suffice to provide good water for everyone. It is a question of priorities - and whose priorities?

Jim Howard of OXFAM forcefully presented pictures of refugee camps with clear evidence that, even in these extreme situations, modest low-cost sanitation units could create a huge change. Others referred to the night soil disposal system of cities without sewers and probably able to manage without them. John Kalbermatten urged the need for the engineers to be flexible and sensitive in much more than engineering, and he had the remarkable pioneering work of the World Bank to give real authority to his remarks on this theme. He called also for 'a massive effort of training at every level, from the finance minister to show him the options and the potential of the technologies available to the village service worker who must change the washer on the community's hand-pump'.

Following this training theme, Brian Bennell wanted 'bare-foot engineers', the people who could maintain their own systems and depend on themselves to do this rather than look to the government to do it for them. In discussion, it was recognised that community participation could create more risk of poor or erratic construction standards, and that new community and organisation structures would be required to undertake and sustain new tasks which must be continued indefinitely.

❝ *The solution is clear, the technology exists* (Ian Waddington). *The money is there. Each day we spend $240 million on cigarettes, more than enough to pay for the Decade* (Peter Bourne). ❞

The case for training in these directions and that of health education was at least as urgent as in the more technical subjects. Brian Bennell recognised the shortages of maintenance men, managers and accountants as possibly more telling than that of design or construction skills. It is expected that on average, three-quarters or more of the cost of Decade programmes will be met by the countries where these projects are undertaken: some countries such as Nigeria may be economically strong enough to meet nearly all the cost, while others may need substantial aid. Even so, the World Bank and practical experience made clear that to sustain water supply and sanitation with adequate maintenance, continuing income must be developed. In many cases, very poor people were already paying a notable share of their week's earnings to get present poor supplies from water-vendors or other points. Well-prepared schemes could provide something much better for less cost, and keep the system going at that cost. But clearly grass-roots involvement and a modest book-keeping team were each necessary for this to be effective.

When Tom King had opened the conference he had already reminded the audience that the UK Government were supporting water and sanitation projects in 28 countries and especially programmes of training. Brian Bennell now pointed to the courses closely related to the needs of developing countries, available in the UK at places such as Loughborough, Imperial College and Middlesex Polytechnic. There are some 1,600 engineering students following course in the UK on ODA grants.

Discussion turned in the setting of community involvement and training to the role 'twinning' could play in helping developing townships and in mobilising both the water industry and the public in developed countries to contribute fully to the Decade. Cornelis van der Veen described the twinning of Amsterdam with Djarkarta in Indonesia: the exchange of personnel over a number of years not only met technical training needs and solved specific problems but also led to much fuller mutual understanding because the relationship was not transient but continuing. Brian Bennell said that between the Wessex Water Authority and the

We can argue till the cows come home about structures, but in the end structures are inanimate. What makes things happen are people, motivation, self-confidence. We are deluding ourselves that we shall make progress unless we build up the self-confidence of communities in the Third World, unless they have the will to make use of the resources available.

Frank Judd

island of St. Lucia a similar link had been initiated and was continuing well. The sending out of water authority people had been an enormous help in refurbishing the island's water system after hurricane damage.

With these various aspects of suitable technology, good training and sustained effort backed by continuing income and community involvement well identified, John Kalbermatten rejected the argument put in discussion from the floor that the Decade would leave a legacy of even greater problems in the 1990s as a result of developing countries being unequal to operating the technologies which it introduced.

Public opinion and further action in UK

SPEAKING in the final session, Baroness White maintained the practical emphasis. In her travels over many years, she had been struck by how much a little ingenuity coupled with local cooperation could achieve. On one visit, she had seen a simple water supply introduced by a missionary transform the life of the village. In China, there were also lessons for the developed countries to heed: they collected human wastes and carried them by boat to re-use on farm-land, so that their value was not lost. In all such cases, there was a need for a local focal point to provide the method for the community to act together.

This Decade of effort is one of the most appealing international concepts, with immense possibilities of enlarging people's range of understanding (Baroness White). *You can be assured of the support of a very significant part of public opinion and your friends in the media will want to help you in your task* (Conor Cruise O'Brien).

Similarly UK effort for the Decade would need to be focussed and concentrated so that people could understand it, and not be daunted by the scale of the task. Baroness White felt sure that, aside from what governments or voluntary-aid bodies such as OXFAM would do, other voluntary organisations, especially those related to women, would readily see the moral commitment which the Decade called for; but they would need informing about it by speakers and films like those in today's programme. Dr Conor Cruise O'Brien confirmed that public opinion would be stirred as the scale of present suffering from poor water and sanitation was exposed. He compared it as an outrage with the slave trade in the past, and saw the indifference of rich countries to it as like the then British Government ignoring the 1845-1847 Irish famine. We had no right to despise those who were insensitive to such suffering in the past if in other directions we widely ignore the equivalent of it in our own time.

Baroness White had ended her remarks asking what was now to be done in practical terms, by the National Water Council in particular and by others who would be concerned to act on some part of the need they could grasp. Sir Robert Marshall, winding up the discussion, warmly echoed Baroness White's emphasis that people must not be daunted, and that action must be comprehensible.

The Council felt it right to take up the Decade and spread understanding of it. This conference was a first step in that. For various other actions, the Council were sure they would find within the water industry people to undertake tasks for the Decade. We owed this response to the Decade, by

moral compulsion, by the desire to share. As to finding the finance to do it, this could be sought through voluntary giving, with the advice of the voluntary bodies such as OXFAM and Save The Children. There would be no question of the customers having to pay for it, save that everyone was a water user, so the voluntary gifts would be from customers in this sense.

The Council is very conscious that it could serve as a pivot also for the collection and dissemination of information, and should do so. The Council had already needed help to mount this conference, and was most grateful for the ready generosity with which it had been given.

Finally, Sir Robert Marshall picked out a few points that had struck him with special force:

- Manpower-aid was probably more important than capital-aid. There must be special emphasis on training, especially on training those who would conduct training in the Third World. This was one sector in which Britain could best help.

- The cycle of health and of activity, in childhood and later life. Bad water and sanitation pull people down; good water opened up a different life through better health and greater strength. Thus providing water services is not primarily a technology, it is a response to the needs of a community.

- Governments have to be involved, but so, even more, do ordinary people in every community. Governments have competing priorities, are often far away and erratic in

‘For all its world scale, the problem is of profound personal importance to billions of individuals lacking access to water or lacking access to sanitation ... We must not be daunted by the numbers but think of the individuals.’

Sir Robert Marshall

their notice of local situations. So people must depend in large part on themselves to see that water supply and sanitation are kept going, repaired, maintained, renewed as necessary, and that the income for this never-ending work is regularly secured.

- Most of all perhaps, the mutuality of the situation between the developing countries and ourselves. It is as important for us to help them as it is for them to be helped.

In closing the discussion, Sir Robert thanked everyone who had made the day so worthwhile.

Postscript

Since the Conference, the Chairman of the National Water Council has received many letters about the Conference including several with suggestions for specific action to make an effective UK contribution to the Decade. The suggestions included:

* Short-term exchanges of technical staff between British water authorities and companies and similar organisations in developing countries

* Better facilities for attaching health education specialists to water engineering projects being carried out by British firms

* Getting BBC or ITV to make television programmes about the water problems of the Third World (like the recent *Horizon* programme about bilharzia), to arouse public opinion.

These suggestions will be followed-up, with others that may follow later and be equally welcome.

6 February 1981

Appreciation

The National Water Council thanks the speakers and all those who gave help and encouragement for the holding of this Conference in London in the first month of the Decade. They include:

UN Development Programme, World Bank and World Health Organisation.

Rt Hon. Tom King MP (Minister for Local Government and Environmental Services) and the Department of the Environment.

Rt Hon. Sir Ian Gilmour Bt MP (Lord Privy Seal), Mr Neil Marten MP (Minister of State) Foreign and Commonwealth Office.

The London School of Hygiene and Tropical Medicine.

Oxfam, VSO and Save the Children Fund.

Mr Jon Tinker of Earthscan.

The Royal Society of Chemistry, for the use of the lecture theatre.

This report of the Conference was prepared by Roy Laishley and Ken Laidlaw, Development Press Services, Brookdale, Station Road, Plumpton Green, East Sussex, and edited by David Kinnersley, Senior Economic Adviser, NWC, who organised the Conference.

Photographs courtesy Earthscan.

Further reading

This section reproduces a summary by the World Bank of selected publications and adds a few others written or edited by people who spoke at the Conference.

World Bank studies in water supply and sanitation

SINCE 1976, Bank staff and researchers from various countries have been analysing the economic, environmental, health, and sociocultural effects of various sanitation technologies to identify the most appropriate systems for the needs, preferences, and resources of different areas. The research project (RPO 671-46) has included field investigations in nineteen countries. The findings of this multidisciplinary effort are available in three volumes forthcoming from The Johns Hopkins University Press; they are:

Number 1 **Appropriate sanitation alternatives: A technical and economic appraisal**, by John M. Kalbermatten, DeAnne S. Julius, and Charles G. Gunnerson. April 1981.

This volume summarises the technical, economic, environmental, health, and sociocultural findings of the Bank's research programme and then discusses the aspects of programme planning that are necessary for implementing the findings. The most important conclusion is that there are many kinds of technology between the unimproved pit latrine and conventional sewerage that can be safely and cheaply used on a wide scale. Sanitation sequences -- step-by-step improvements in sanitation

technology that can be built in stages as the economic well-being and the aspirations of a community grow -- are designed and costed. In addition, a new and promising approach is presented for linking potential benefits to health with improvements in environmental sanitation.

Number 2 **Appropriate sanitation alternatives: A planning and design manual**, by John M. Kalbermatten, DeAnne S. Julius, Charles G. Gunnerson, and D. Duncan Mara. May 1981.

This manual presents the latest field results of the research, summarises pertinent information from other publications on sanitation programme planning, and describes the engineering details of alternative sanitation technologies and how they can be upgraded. The manual examines three central topics: the socioeconomic aspects of sanitation programme planning, the planning itself, and the technological options. It is extensively illustrated with technical diagrams of the recommended sanitation systems and their components.

Number 3 **Sanitation and disease: Health aspects of excreta and wastewater management**, by Richard G. Feachem, David J. Bradley, Hemda Garelick, and D. Duncan Mara. Late 1981.

Improvements in health are the main social and economic benefit that development planners and economists hope to achieve through investment in waste disposal. Part One of this volume provides a synthesis and analysis of information and research on the interaction between excreta and sullage and health; categories of excreta-related infections to the environment; the use of indicators of pathogenic contamination and the ability of pathogens to survive waste treatment, reuse, and effluent- discharge systems; and the benefits and sociocultural effects of sanitation programmes. Part Two is an encyclopedic compilation - by pathogen or insect vector - of information concerning the epidemiology

of sanitation-related diseases and the ways in which particular technologies for waste disposal and reuse affect the survival and dissemination of the disease agents. The book is a unique reference both for the health or sanitation specialist and the programme planner.

Appropriate technology for water supply and sanitation

The Bank's Transportation, Water, and Telecommunications Department has initiated, under this main title, a continuing series of reports that treat in detail the various issues encountered in the project's study of sanitation and sanitation programme planning. Series volumes to date are:

1 **Technical and economic options**, by John M. Kalbermatten, DeAnne S. Julius, and Charles G. Gunnerson. December 1980.

This paper reports technical, economic, health, and social findings of the research project 'Appropriate technology for water supply and sanitation.' The report discusses the programme planning necessary to implement technologies available to provide socially and environmentally acceptable, low-cost water supply and waste disposal.

1a **A Summary of technical and economic options**, by John M. Kalbermatten, DeAnne S. Julius, and Charles G. Gunnerson. December 1980.

This paper summarises the broad technical, economic, health, and social findings of the research and discusses the aspects of programme planning necessary to implement the findings.

2 **A planner's guide**, by John M. Kalbermatten, DeAnne S. Julius and Charles G. Gunnerson. December 1980.

This report provides information and instruction on how to design and implement appropriate technology projects based on the findings reported in *Technical and Economic*

Options. It provides guidelines and design tools for the engineers and sanitarians responsible for planning and implementing sanitation projects.

3 **Health aspects of excreta and sullage management - A state-of-the- art review**, by Richard G. Feachem, David J. Bradley, Hemda Garelick, D. Duncan Mara. December 1980.

This report sets out to provide information about the interaction between excreta and health so engineers and planners may make more informed and rational decisions regarding the effects on disease of improvements in excreta disposal and the ways in which particular excreta disposal and reuse technologies affect the survival and dissemination of particular pathogens. It has been written with an emphasis on presenting the complex, and sometimes contradictory, evidence as clearly and concisely as possible.

4 **Low-cost technology options for sanitation - a state-of-the-art review and annotated bibliography**, by Witold Rybczynski, Chongrak Polprasert, and Michael McGarry (a joint World Bank/International Development Research CENTRE PUBLICATION available from: IDRC, P.O. Box 8500, Ottawa, Ontario, Canada K1G 3H9). 1978.

This comprehensive technology review and bibliography describes alternative approaches to collection, treatment, reuse, and disposal of wastes. It is designed to describe for the policymaker, the administrator, and the engineer the broad range of systems of human waste management available today.

5 **Sociocultural aspects of water supply and excreta disposal**, by Mary Elmendorf and Patricia Buckles. December 1980.

This report examines the social and cultural factors influencing people's responses to water supply and exreta disposal technologies. It describes the methodology and questionnaire used to investigate how sanitation and water supply problems are perceived and to what extent people

would be willing to participate in projects to improve their existing situation, and it suggests an approach that can be used by planners to integrate social and cultural considerations into project design to ensure the introduction of water supply and excreta disposal technologies that will be accepted, properly used, and maintained.

6 **Country studies in sanitation alternatives**, by Richard A. Kuhlthau (ed.). December 1980.

The empirical data base for the research project on appropriate technology for water supply and sanitation in developing countries is composed of thirty-four case studies carried out in communities of eleven countries during 1977-78. Countries and communities were selected to obtain a diverse sample of existing sanitation technologies operating under a variety of physical and economic conditions. This report presents the technical and economic information collected by the local field consultants at each site.

7 **Alternative sanitation technologies for urban areas in Africa**, by Richard G. Feachem, D. Duncan Mara, and Kenneth O. Iwugo. December 1980.

This report summarises the results of field studies carried out in five African countries during 1977-78 as part of the Bank research project. It describes four sanitation technologies as they are currently used in urban areas in Africa - pit latrines, composting toilets, bucket latrines, and aquaprivies - and discusses their technical, economic, institutional, social, and health requirements and constraints. Methods for technology comparison and selection are suggested, and areas for future research are indicated.

8 **Seven case studies of rural and urban fringe areas in Latin America**, by Mary Elmendorf (ed.). December 1980.

This report is a collection of seven case studies of rural and urban fringe areas in Latin America included in the Bank's research project. The long-range objective of the research is to provide project planners with an understanding of human and behavioural factors that influence whether users will

accept, properly use, and maintain water supply and excreta disposal facilities introduced into their communities.

9 **Design of low-cost water distribution systems**, by Donald T. Lauria, Peter J. Kolsky, and Richard N. Middleton (Part 1); Keith Demke and Donald T. Lauria (Part 2); and Paul V. Herbert (Part 3). December 1980.

Designers of water distribution systems have not had available simple analytical tools with which to test the effect on system costs of various design assumptions. In consequence, secondary distribution networks have often been designed by rule of thumb without a full appreciation of the effects of the designers' decisions. The effects of the resulting overdesign can be very serious, particularly where service to the urban poor is a concern and levels of affordability are low. This report is a collection of three papers that present the results of rigorous analyses of water systems for several urban areas in developing countries. From these analyses, simple mathematical models are developed that permit prediction of total pipe length and average diameter and network cost, giving decisions on variables such as per capita water usage and spacing of public standpipes or house connections. Examples apply these equations to typical design problems.

10 **Night-soil composting**, by Hillel I. Shuval, Charles G. Gunnerson, and DeAnne S. Julius. December 1980.

Among the problems facing those who depend on conservancy or other systems which separately dispose of graywater and night soil is the lack of a safe, inexpensive treatment method for night soil. This paper reviews the public health requirements for successful composting and the state of the art for the two methods of windrow or pile composting that are presently used for sewage sludge in the United States. The paper concludes that aerobic composting of night soil is suitable for developing countries because of its simplicity in operation, limited need for mechanical equipment, low cost, and its effectiveness in inactivating pathogens (thus assuring that the compost can be used without causing any public health hazard).

11 **A field manual**, by John M. Kalbermatten, DeAnne S. Julius, and Charles G. Gunnerson. December 1980.

This report provides information -- for the community worker, sanitarian, extension worker, and others without background in sanitary engineering but who are responsible for the implementation of sanitation programmes -- about the selection and construction of on-site sanitation systems reviewed in the Bank's research project.

12 **Low-cost water distribution - A field manual**, by Charles Spangler. December 1980.

This companion volume to *A field manual* provides non-engineers with the information necessary to design and implement simple water distribution systems for small communities.

World Bank institutional publications, Sector Policy Papers, World Bank Issues Papers, and World Bank Staff Working Papers

Many of the isssues that will be addressed during the International Drinking Water Supply and Sanitation Decade have been, and will continue to be, investigated in a variety of other World Bank publications. Too numerous for all to be listed here, these documents are indexed and described annually in the *Catalog* of World Bank publications. Notable among recent publications relevant to the concerns of the Decade are: *World Development Report, 1980* (New York: Oxford University Press, 1980; available directly form the publisher) and its background Staff Working Papers (numbers 400-412); the *Annual Report 1980;* the *Health Policy Paper* (February 1980); and the Poverty and Basic Needs Series of papers, especially *Water Supply and Waste Disposal* (September 1980).

Availability of publications

World Bank Studies in Water Supply and Sanitation are available directly from The Johns Hopkins University Press

(please place orders with the publisher or its local agents or distributors and ask them for prices and currency equivalents):

The United Kingdom, Continental Europe, The Near East and Middle East, and Africa

The Johns Hopkins University Press, Ltd., 2-4 Brook Street, London W1Y 1AA, England

Unless otherwise noted above, volumes in the *Appropriate Technology for Water Supply and Sanitation* report series, and the Bank's *Catalog* of publications, are available free of charge from:

The World Bank
Publications Unit
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

Requests for the Bank's *Catalog* that originate in Europe should be addressed to:

The World Bank
European Office
66, avenue d'Iéna
75116 Paris, France.

Other books

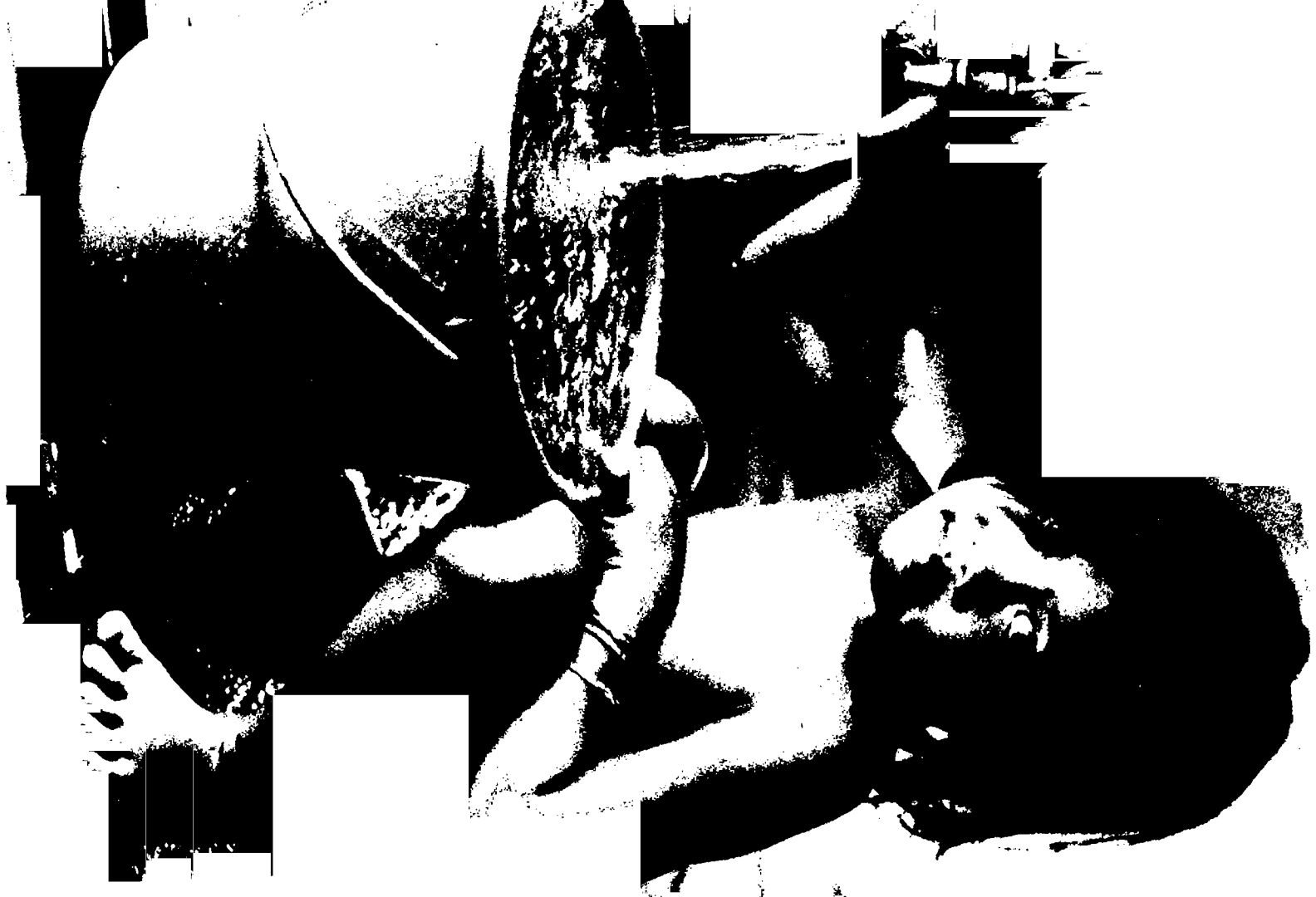
British science and technology for developing countries, A directory of sources of information and assistance. Published by OVERSEAS DEVELOPMENT ADMINISTRATION (free of charge) Eland House, Stag Place, London SW1E 5DH

Drawers of water: Domestic water use in east africa. by Gilbert F. White, David Bradley and Anne V. White, (1972) UNIVERSITY of CHICAGO PRESS.

Evaluation for village water supply planning, by S. Cairncross, I. Carruthers, D. Curtis, R. Feachem, D. Bradley and G. Baldwin. (1980) JOHN WILEY and SONS.

Water health and development, By R. Feachem, E. Burns, S. Cairncross, A. Cronin. P. Cross, D. Curtis, M.K. Khan, D. Lamb, H. Southall (1978) published by TRI-MED BOOKS.

Water, wastes and health in hot climates, edited by R. Feachem. M. McGarry, D. Mara (1977), published by JOHN WILEY and SONS.



NWC International Advisory Service

THROUGH its International Advisory Service (IAS), the National Water Council makes available overseas, on normal commercial terms, the expertise of staff employed in water authorities and water companies.

This service can be arranged directly with the Council or through consulting engineers or other British companies engaged in work related to water, or through British embassies overseas. The IAS will gladly take part of an assignment in which it has a strong capability, such as operational or maintenance skills, or training advice, while others undertake other parts of the assignment such as the design and construction of new facilities.

Senior staff can undertake short visits to client countries, or teams stay there for longer periods. Combinations of on-the-spot advice and services with continuing support from UK can be arranged to fit particular needs.

The water authorities in England and Wales are organised on an integrated basis for regions defined by watershed boundaries. They deal with water supply, sewage disposal and the whole range of river basin management tasks - resource development, pollution control, fisheries, land drainage and flood alleviation.

Advice can thus be made available on all these fields of activity, as to operations or planning, and in relation to all aspects of organisation and management including public administration and advice to governments at central or local levels, economic and financial policies and tariffs, and manpower development and training.

NWC IAS, 1 Queen Anne's Gate, London SW1H 9BT.
Telephone: 01-222 8111. Telex: 918518.
Personnel: David Kinnersley, Alan Round or Alan Porter.

National Water Council
Training facilities

IN ITS Overseas Manpower Development Group, the National Water Council combines staff who have professional skills in training at home and overseas with access to the facilities of the UK water industry for residential courses or on-the-job experience with water authorities, consulting engineers and manufacturers.

This service, which is offered on commercial terms, includes:

Residential training: NWC centres have some 250 residential training places and offer at various times 150 different courses spanning all disciplines and levels.

Work experience programmes at UK installations: Suitable overseas personnel can be given practical experience of operating and maintaining plant and processes not yet operational in their own countries.

Local training advice and supervision: Members of OMDG staff will advise on local training programmes overseas and provide a continuing oversight of their implementation.

Consultancy on manpower use: Most OMDG staff have a background of technical experience and will undertake short assignments covering the wider context in which training programmes are to be made effective.

OMDG also has detailed information on courses in many aspects of water management provided at universities and polytechnics in UK.

Enquiries: Robin Turrell, National Water Council, James House, 27/35 London Road, Newbury, Berkshire. Telephone: 0635-30777

Participants in the Conference 27 January 1981

A

Brian Appleton,
World Water,
Telford House,
PO Box 101,
26-34 Old Street,
London EC1P 1JH.

Dr J.P. Arthur,
Gilmore Hankey Kirk
Partnership,
St. James's Hall,
Moore Park Road,
London SW6.

Ms D. Ayres,
Appropriate Health
Resources and
Technologies Action Group,
85 Marylebone High Street,
London W1.

B

Peter A. Banks,
John Taylor and Sons,
Consulting Engineers,
representing The Institution
of Public Health Engineers,
13 Grosvenor Place,
London SW1X 7EN.

Paul Batchelor,
Associate Director,
Coopers and Lybrand,
Abacus House,
Gutter Lane,
London EC2.

Mrs. P. Batty Shaw,
Chairman,
National Federation of
Women's Institutes,
39 Eccleston Street,
London SW1.

B.N.U. Bennell,
Principal Engineering
Adviser,
Overseas Development
Administration,
Eland House,
Stag Place,
London SW1.

Miss Julia Bignell,
Surveyor,
Surrey House,
1 Throwley Way,
Sutton,
Surrey.

C. Birch,
Municipal Engineering,
178-202 Great Portland Street,
London W1N 6NH.

Dr. D.S. Boak,
Science and Technology
Group,
Education Medicine and
Science Division,
The British Council,
10 Spring Gardens,
London SW1A 2BN.

J.M. Boon,
Managing Director,
East Anglian Water Company,
163 High Street,
Lowestoft,
Suffolk.

P. Borrows,
Acting Manager -
Advisory Service,
Thames Water Authority,
New River Head,
Rosebery Avenue,
London EC1R 4TP.

Dr. Peter G. Bourne,
Assistant Secretary-General,
UN Development Programme
and Coordinator for the Decade,
Room 2386,
One United Nations Plaza,
New York NY 10017.

Prof. David J. Bradley,
Director,
Ross Institute of Tropical
Hygiene,
Keppel Street,
London WC1E 7HT.

Mrs. I. Brain,
Chairman,
Housing Special Committee,
The National Council of
Women of Great Britain,
24 Vine Court Road,
Sevenoaks, Kent.

J.R. Browning,
General Manager and
Engineer,
Bristol Waterworks Company,
PO Box 218,
Bridgwater Road,
Bristol.

C Sir Ralph Carr-Ellison,
Chairman,
Northumbrian Water Authority,
Northumbria House,
Regent Centre,
Gosforth,
Newcastle upon Tyne NE3 3PX.

Dr. I.D. Carruthers,
School of Rural Economics,
Wye College,
Near Ashford,
Kent TN25 5AH.

C.J. Casserley,
Head of Information
Services,
National Water Council.

R.D. Channon,
Paterson Candy
International Limited,
21 The Mall,
Ealing,
London W5 2PU.

Ms Ann Charnock,
New Civil Engineer,
26-34 Old Street,
London EC1V 9AD.

G. Charnock,
Deputy Editor,
Consulting Engineer,
Elm House,
10-16 Elm Street,
London EC1X 0BP.

Miss V. Choo,
The Lancet,
7 Adam Street,
London WC2N 6BD.

P.G. Clark,
Director,
Resource Planning,
Yorkshire Water Authority,
West Riding House,
67 Albion Street,
Leeds LS1 5AA.

K.F. Clarke,
Assistant Director
Resource Planning,
Anglian Water Authority,
Diploma House,
Grammar School Walk,
Huntingdon PE18 6NZ.

A. Coad,
University of Technology,
Loughborough,
Leics LE11 3TU.

John Collett,
Water Project Officer,
The Intermediate Technology
Development Group,
9 King Street,
London WC2E 8HN.

V.K. Collinge,
Director of Planning,
Water Research Centre,
Henley.

Arthur Conway,
Science, Industry and
Agriculture Unit,
BBC External Service,
Room 629 SE,
PO Box 76,
Bush House,
Strand,
London WC2B 4PH.

Miss C. Cox,
National Water Council.

W.A. Cranston,
Ham Baker and Co. Ltd,
Clay Lane,
Oldbury,
Warley,
West Midlands B69 4TF.

E.W. Crisp,
Balfours,
Yeoman House,
63 Croydon Road,
London SE20 7TW.

Mel Crofton,
Technical Education and
Training Organisation
for Overseas Countries
(TETOC),
Dacre House,
17-19 Dacre Street,
London SW1H 0DJ.

Dr. Donald Curtis,
Lecturer in the
Sociology of Development,
Development Administration
Group,
Institute of Local
Government Studies,
Birmingham University,
Birmingham B15 2TT.

Dr. John Cuthbert,
Director,
Water Research Centre,
Stevenage.

D

J.M.Y. Dickens,
Director of Manpower,
National Water Council.

Dr. S.K. Dutta,
Middlesex Polytechnic,
Queensway,
Enfield,
Middlesex EN3 4SF.

E

George Eden,
Binnie and Partners,
Artillery House,
Artillery Row,
Westminster,
London SW1P 1RX.

A. Edwards,
Vice Chairman,
c/o Mrs. G. Johnson.
Thames Water Authority.
New River Head,
Rosebery Avenue,
London EC1R 4TP.

Geoffrey Edwards,
Chairman,
Thames Water Authority,
New River Head,
Rosebery Avenue,
London EC1R 4TP.

Chris Evans,
CA Testing and
Research,
Harpenden Rise Laboratory,
Harpenden Rise,
Harpenden,
Herts AL5 3BJ.

F

Mrs. Z. Feachem,
Ross Institute of
Tropical Hygiene,
London School of Hygiene
and Tropical Medicine,
Keppel Street,
London WC1.

Dr. Ian T. Field,
Department of Health
and Social Security,
Alexander Fleming House,
Elephant and Castle,
London SE1 6BY.

H. Fish,
Chief Executive,
Thames Water Authority,
New River Head,
Rosebery Avenue,
London EC1R 4TP.

G. Fitch,
Director,
Engineering Operations,
Crown Agents for
Overseas Governments,
4 Millbank,
London SW1.

E.W. Flaxman,
The Institution of Public
Health Engineers,
13 Grosvenor Place,
London SW1X 7EN.

R. Foster,
Allott and Lomax,
Fairbairn House,
23 Ashton Lane,
Sale,
Cheshire M33 1WP.

Les Freeman,
National Water Council.

A.C. Frood,
Managing Director,
Crown Agents for
Overseas Governments,
4 Millbank,
London SW1.

G C. St. J. Gates,
Department of the
Environment,
2 Marsham Street,
London SW1.

D. Gilmore,
Gilmore Hankey Kirk
Partnership,
St. James's Hall,
Moor Park Road,
London SW6.

Sir Charles Graham,
National Water Council,
Crofthead,
Longtown,
Cumbria.

M.B. Grieveson,
Overseas Development
Administration,
Eland House,
Stag Place,
London SW1.

Ms Elizabeth Grundberg,
UNICEF,
46 Osnaburgh Street,
London SW1.

H T. Hall,
Sir M. MacDonald and Partners,
Demeter House,
Station Road,
Cambridge CB1 2RS.

M. Mokammel Haque,
Director of Food Production
and Rural Development,
Commonwealth Secretariat,
Marlborough House,
Pall Mall,
London SW1Y 5HX.

The Rev. D. Harding,
United Nations Association,
3 Whitehall Court,
London SW1.

P. Hartley,
Trevor Crocker and Partners,
Drive House,
323/339 London Road,
Mitcham, Surrey.

M.G. Healey,
Department of the Environment,
2 Marsham Street,
London SW1.

E.J.W. Henry,
Wallace Evans and Partners,
Plymouth House,
Penarth CF6 2YF,
South Glamorgan.

Dr. E.L.P. Hessing,
Project Manager,
WHO International Reference
Centre,
PO Box 5500,
2280 HM Rijswijk, The Hague,
Netherlands.

Ms Christine Hogg,
Executive Director,
Appropriate Health Resources
and Technologies Action
Group,
85 Marylebone High Street,
London W1.

Mrs V.A. Homer,
National Water Council.

Miss G. Hooper, MEP,
11 Cleveland Row,
London SW1.

J. Howard,
OXFAM,
274 Banbury Road,
Oxford OX2 7DX.

W.D. Hughes,
Training Division,
National Water Council,
Tadley Court,
Tadley,
Nr. Basingstoke,
Hants.

J.A.C. Humphries,
National Water Council,
21 Parkside,
Wimbledon,
London SW19.

Mrs M.E. Hurtado,
Third World Media Ltd,
New Zealand House,
Haymarket,
London SW1.

I Mrs Sylvia Ismail,
National Federation of
Women's Institutes,
39 Eccleston Street,
London SW1W 9NT.

J Ir. A.G.N. Jansen,
Regentesse plantsoen 13,
2801 CK Gouda,
Holland.

C.A. Jellier,
John Burrow and Partners,
Consulting Engineers,
Exeter.

H.G. Johnson,
Sir William Halcrow and
Partners,
Vineyard House,
44 Brook Green,
London W6 7BY.

E.W.Jones,
Room 410A,
Ministry of Agriculture,
Fisheries and Food,
Great Westminster House,
Horseferry Road,
London SW1P 2AE.

F. Judd,
Director,
Voluntary Services Overseas,
9 Belgrave Square,
London SW1.

K J.M. Kalbermatten,
Senior Adviser, Water and
Wastes Advisory Staff,
Transportation, Water and
Telecommunications Dept,
The World Bank,
1818 H Street N.W.,
Washington DC 20433, USA.

Dr. Neil Kemp,
Education Medicine and
Science Division,
The British Council,
10 Spring Gardens,
London SW1A 2BN.

James King,
Press Officer,
UN London Information Centre,
14 Stratford Place,
London W1.

The Rt. Hon. Tom King, MP,
Minister for Local
Government and
Environmental Services,
2 Marsham Street,
London SW1.

David J. Kinnersley,
Senior Economic Adviser,
National Water Council.

Ir. J.H. Kop,
Chief, Bureau of Planning,
Netherlands Waterworks
Association (VEWIN),
Rijswijk,
Netherlands.

N.T. Kottegoda,
The University of Birmingham
Department of Civil
Engineering,
PO Box 363,
Birmingham B15 2TT.

L

Ken Laidlaw,
Development Press Services,
'Brookdale',
Station Road,
Plumpton Green,
East Sussex.

Roy Laishley,
Development Press Services,
'Brookdale',
Station Road,
Plumpton Green,
East Sussex.

Ms Jean Lamont,
Projects and Export Policy
Division,
Department of Trade,
1 Victoria Street,
London SW1H 0ET.

Geoffrey Lean,
The Observer,
8 St. Andrews Hill,
London EC4V 5JA.

Dr. B. Lloyd,
Department of Microbiology,
University of Surrey,
Guildford,
Surrey GU2 5XH.

M.J. Lowther,
Newcastle and Gateshead
Water Company,
PO Box 10,
Allendale Road,
Newcastle upon Tyne NE6 2SW.

Miss S. Lucas,
National Water Council.

J.P. Lumbers,
Imperial College,
Department of Civil
Engineering,
South Kensington,
London SW7.

Dr. T. Lusty,
OXFAM,
274 Banbury Road,
Oxford OX2 7DX.

M

J. McNaught,
Executive Officer,
Confederation of Shipbuilding
and Engineering Unions,
140/142 Walworth Road,
London SE17 1JW.

George McRobie,
Chairman,
Intermediate Technology
Development Group Ltd,
9 King Street,
London WC2E 8HN.

Ian McIntosh,
Publishing editor,
John Wiley and Sons,
Baffins Lane, Chichester,
Sussex.

J.R. Marsden,
Fawcett and Partners,
21 Inner Park Road,
London SW19 6ED.

J.K. Marshall,
Mander Raikes and Marshall,
Lombard House,
145 Great Charles Street,
Birmingham B3 3JR.

Sir Robert Marshall,
Chairman,
National Water Council.

A. Maskell,
Howard Humphreys,
Thorncroft Manor,
Dorking Road,
Leatherhead,
Surrey KT22 8JB.

A. Massam,
New Standard,
121 Fleet Street,
London EC4.

D. Matthews,
Chairman,
Yorkshire Water Authority,
West Riding House,
67 Albion Street,
Leeds LS1 5AA.

Miss B. Merson,
Chairman, Consumer Affairs
Special Committee,
The National Council of
Women of Great Britain,
37 Thames Village,
Hartington Road,
Chiswick W4.

Ken J. Mills,
CA Testing and Research,
Harpenden Rise Laboratory,
Harpenden Rise,
Harpenden,
Herts AL5 3BJ.

D.F. Milton,
Projects and Export Policy
Division,
Department of Trade,
1 Victoria Street,
London SW1H 0ET.
A.A.H. Murray,
Wallace and Tiernan Ltd,
Priory Works,
Tonbridge,
Kent TN11 0QL.

Ed Murray,
Technical Development
Officer,
Voluntary Service Overseas,
9 Belgrave Square,
London SW1.

D.C. Musgrave,
Department of the Environment,
2 Marsham Street,
London SW1.

N G. Nicholls,
Pipe Manufacturers Association,
Stanton and Staveley,
PO Box 72,
Nr. Nottingham NG10 5AA.

The Lord Nugent of
Guildford,
Blacknest Cottage,
Dunsfold,
Nr. Godalming,
Surrey GU8 4PE.

O H.R. Oakley,
Watson Hawksley,
Terriers House,
Amersham Road,
High Wycombe,
Bucks.

Dr. Conor Cruise O'Brien,
Editor-in-Chief,
The Observer,
8 St. Andrews Hill,
London EC4.

A.A. Oldfield,
National Water Council.

J. Oldfield,
White Lodge,
West Road,
Weavenham,
Cheshire.

R. Penrhyn Owen,
Director,
The Water Companies'
Association,
14 Great College Street,
London SW1P 3RX.

P G.D. Palmer,
Association of Consulting
Engineers,
Alliance House,
12 Caxton Street,
London SW1.

G. Palmer, Esq.,
University of Birmingham,
P.O. Box 363,
Birmingham B15 2TT.

A.F. Pavey,
Haiste and Partners,
Belmont House,
20 Wood Lane,
Headingley,
Leeds LS6 2AG.

D.J. Pearson,
Assistant Director,
Operations,
Anglian Water Authority,
Diploma House,
Grammar School Walk,
Huntingdon PE18 6NZ.

Dr. Roger Perry,
Public Health Engineering,
Department of Civil Engineering,
Imperial College,
London SW7 2AZ.

M.B. Pescod,
Tyne and Wear Professor
of Environmental Control
Engineering,
University of Newcastle
upon Tyne,
Claremont Road,
Newcastle upon Tyne NE1 7RU.

Tim Phipps,
Deputy Director General,
Save the Children,
157 Clapham Road,
London SW9.

John Pickford,
WEDC Group Leader,
University of Technology,
Loughborough,
Leics LE11 3TU.

T.D. Pike,
Overseas Development
Administration,
Eland House,
Stag Place,
London SW1.

E.J. Pipe,
Planning Department,
Central Electricity
Generating Board,
Sudbury House,
15 Newgate Street,
London EC1A 7AU.

A.R. Porter,
Director of Finance,
National Water Council.

P.A.D. Powell,
General Manager and
Engineer,
Folkestone and District
Water Company,
The Cherry Garden,
Cherry Garden Lane,
Folkestone.

G. Power,
World Water,
Telford House,
PO Box 101,
26/34 Old Street,
London EC1P 1JH.

J.R. Preston,
Watson Hawksley,
Terriers House,
Amersham Road,
High Wycombe,
Bucks HP13 5AJ.

Mrs. R. Pugh,
Consumer Special Committee,
The National Council of
Women of Great Britain,
5 The Willows,
Hitchin,
Herts.

Q D. Quinion,
Chief Engineer,
Tarmac Construction Ltd,
PO Box 10,
Construction House,
Birch Street,
Wolverhampton SV1 4HY.

R G.H. Read,
World Bank Technology
Advisory Group,
c/o Ross Institute of
Tropical Hygiene,
Keppel Street,
London WC1E 7HT

Miss Judy Redfeann,
Nature,
4 Little Essex Street,
London WC2.

E.C. Reed,
Director of Operations,
Thames Water Authority,
New River Head,
Rosebery Avenue,
London EC1R 4TP.

D.A.D. Reeve,
Chief Executive,
Severn Trent Water Authority,
Abelson House,
2297 Coventry Road,
Sheldon,
Birmingham B26 3PU.

A.C. Richmond,
Director,
Wallace and Tiernan Ltd,
Priory Works,
Tonbridge,
Kent.

K.F. Roberts,
Chief Executive,
Wessex Water Authority,
Wessex House,
Passage Street,
Bristol BS2 0JQ.

A.S. Robertson,
Northumbrian Water Authority,
Northumbria House,
Regent Centre,
Gosforth,
Newcastle upon Tyne NE3 3PX.

B.H. Rofe,
Rofe, Kennard and Lapworth,
Raffety House,
2-4 Sutton Court Road,
Sutton,
Surrey SM1 4SS.

J.C.A. Roseveare,
Freeman Fox Braine and Partners,
26-27 St. Mary Street,
Cardiff CF1 2PD.

S Miss Leslie Salmon,
Publicity Officer,
Voluntary Service Overseas,
9 Belgrave Square,
London SW1.

The Rev. and Rt.Hon. Lord
Sandford,
House of Lords,
Westminster,
London SW1A 0AA.

M. Sane,
W.S. Atkins and Partners,
Woodcote Grove,
Ashley Road,
Epsom,
Surrey KT18 5BW.

L.A. Seale,
Posford, Pavry and Partners,
Rightwell House,
Bretton Centre,
Peterborough PE3 3DW.

Dr. J. Seamen,
Save the Children,
157 Clapham Road,
London SW9.

R. Simpson,
General Manager,
Rickmansworth and Uxbridge
Valley Water Company,
Batchworth,
Rickmansworth,
Herts WD3 1LB.

A.H.M. Smyth,
Chairman,
Southern Water Authority,
Guildbourne House,
Worthing,
Sussex BN11 1LD.

P. Gordon Spencer,
Director and General Manager,
Essex Water Company,
342 South Street,
Romford,
Essex RM1 2AL.

Kenneth Solly,
Director,
Forum,
2b Beacon Road,
Ditchling,
Hassocks,
Sussex BN6 8UL.

Ms Julia Spry-Leverton,
UNICEF,
46 Osnaburgh Street,
London NW1.

P.F. Stott,
Director General,
National Water Council.

P. Sullivan,
Technical Education and
Training Organisation for
Overseas Countries (TETOC),
Dacre House,
17-19 Dacre Street,
London SW1H 0DJ.

T Miss F. Tait,
Subject Specialist -
Natural Resources and Energy,
Room 1,
1 Duchess Street.
BBC Broadcasting House,
London W1A 1AA.

Adrian Thomas,
Technical Cooperation and
Training Department,
The British Council,
10 Spring Gardens,
London SW1A 2BN

Dr. D. Train,
Cremer and Warner Ltd,
140 Buckingham Palace Road,
London SW1W 9SQ.

R.H. Turpin,
Under Secretary, CIPFA,
232 Vauxhall Bridge Road,
London SW1V 1AU.

Robin Turrell,
National Water Council
Training Division,
Overseas Manpower
Development Group,
James House,
27/35 London Road,
Newbury.

V J.L. van der Post,
Chief Executive,
Water Research Centre,
Henley.

C. van der Veen,
Managing Director,
Amsterdam Water Supply,
Past President, IWSA,
Condensatorweg 54,
1014 Ax Amersterdam,
Netherlands.

W J. Ian Waddington,
Director, Environmental
Health,
European Office,
World Health Organisation,
Copenhagen,
Denmark.

R.J. Wall,
IMI Ltd,
Birmingham.

Brian Walker,
Director,
OXFAM,
274 Banbury Road,
Oxford OX2 7DX.

D. Walker,
The Economist,
25 St. James's Street,
London SW1A 1HG.

D.L. Walker,
Deputy Director General,
National Water Council.

J.K. Waterhouse,
Sir M. MacDonald and Partners,
Demeter House,
Cambridge.

E.W. Watson,
Director, Training Division,
National Water Council,
Tadley Court,
Tadley,
nr. Basingstoke,
Hants.

Mrs Sharon Welch,
Press Officer,
Save the Children,
157 Clapham Road,
London SW9.

The Baroness White,
House of Lords,
Westminster,
London SW1A 0AA.

R.J. White,
National Water Council.

K.W. Whimster,
Chairman of Water and
Sewage Panel,
Association of Consulting
Engineers,
Alliance House,
12 Caxton Street,
London SW1H 0QL.

R.T. Whitely,
Thames Water Authority,
Warren Farm,
Finmere,
Bucks MK18 4AJ.

R.P. Whiting,
Scott Wilson Kirkpatrick
and Partners,
Scott House,
Basing View,
Basingstoke RG21 2JG.

J.D. Winders,
C.H. Dobbie and Partners,
Francis House,
Francis Street,
Westminster,
London SW1P 1DQ.

A.J. Woodford,
Sir Alexander Gibb and Partners,
Earley House,
London Road,
Reading,
Berks RG6 1BL.

R. Woodruff,
British Consultants Bureau,
Westminster Palace Gardens,
1/7 Artillery Row,
London SW1P 1RJ.

Z Mrs Averil Zaniboni,
National Water Council.

Decade mailing list

In response to the support shown at this conference, the National Water Council will take part with others in maintaining a flow of information about the Decade for those in Britain who are interested in various aspects of it. NWC would be glad to start building a mailing list for this purpose. Please send us the details below if you are interested (and are not in the list of participants).

Name .....

Address .....

.....

Please indicate with a circle whether your particular interest is likely to be:

1. Technical/commercial

2. In voluntary work or fund-raising for Decade activities or projects.

3. Linked to a local group or other organisation - if so, indicate briefly nature and size of group.

Please return this form to Decade Information, National Water Council, 1 Queen Anne's Gate, London SW1H 9BT.

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