Planning for Health and Socio-Economic Benefits from Water and Environmental Sanitation Programmes

A Workshop Summary

April 21-22, 1993

Water and Environmental Sanitation Section
Evaluation and Research Office
UNICEF New York

UNICEF

Executive summary

Universal access to water and sanitation by the year 2000 are among the goals set at the World Summit for Children. UNICEF has a commitment to help countries meet these goals. Mid-term goals of a 25 per cent reduction in water coverage gaps and a 10 per cent reduction in sanitation gaps by 1995 have been established. The organisation is also committed to assist in the achievement of goals associated with health and well-being. Recognising the association between water, sanitation and health UNICEF is seeking cost-effective strategies to combine full water and sanitation coverage with maximum health and socio-economic benefits. To provide practical guidelines for a global water and sanitation strategy which incorporates health benefit objectives UNICEF organised a two-day workshop, "Planning for health and socio-economic benefits from water and sanitation programmes", which brought together leaders in the field from major global organisations involved in water, sanitation, hygiene education, epidemiology and development planning.

Participants included representatives of the World Health Organisation, World Bank, United Nations Development Programme, WASH, USAID, the International Water and Sanitation Centre, McGill University, Harvard School of Public Health, All India Institute of Hygiene and Public Health and University Federal of Pelotas. A number of UNICEF regional representatives, country representatives and section chiefs from New York and field offices also participated.

The workshop was organised by the Water and Environmental Sanitation Section and the Evaluation and Research Office, UNICEF, New York, and held in New York, April 21-22, 1993.

The objectives of workshop were to provide inter-agency and inter-sectoral collaboration, to improve knowledge of how health and socio-economic benefits can best be achieved from water, sanitation and hygiene education programmes, and to develop and endorse guidelines for a global strategy which would focus on maximising health and socio-economic impacts.

The presentations and discussions covered six major topics: the health and socio-economic impacts that can be expected from water, sanitation and hygiene education; state of the art techniques for monitoring and measuring health and socio-economic impacts; how to measure behaviour change; the nutritional impact of water, sanitation and hygiene education; developing a conceptual framework for water, sanitation and hygiene education; and planning programmes which have health and socio-economic impacts as their major focus.

Presentations were followed by discussion in consultative groups where major issues raised were debated and related to practical experience. The output from these groups was discussed in plenary and decisions used as a focus for final recommendations for action.

There was strong consensus within the workshop on the framework for a global water, sanitation and hygiene education strategy and on the future focus for the sector. The extent of this consensus indicated widespread acceptance of the need for changes within the sector. It was agreed that the new strategy should focus even more on empowerment of communities including women, capacity building, service delivery, building intra- and intersectoral linkages and advocacy.

The major areas of agreement and recommendations were:

1. Hygiene education must be an integral part of future water and sanitation programmes and the approach to water, sanitation and hygiene education intra-sectoral and inter-disciplinary. The inclusion of professional social scientists within the water and environmental sanitation sector should be promoted.
2. Water and environmental sanitation programmes should be re-oriented to include goals and objectives which focus on health, behaviour change and socio-economic impacts. These objectives should be based on a thorough assessment of the household and community situation and appropriate indicators established for monitoring and evaluation.

Universal access to water and sanitation by the year 2000 are among the goals set at the World Summit for Children. UNICEF has a commitment to help countries meet these goals.

The cost effectiveness of water, sanitation and hygiene education programmes must be improved if universal coverage is to be achieved.

3. Community participation in decision-making, planning, design, management and evaluation should be fundamental to the water and sanitation approach, giving particular attention to including and empowering women at all levels. Guidelines should be provided to support this and a special strategy developed to cover women's involvement in WES decision-making, planning and management at all levels. Special efforts should be made to including more women in WES teams.
4. Capacity building should be a major focus and on-going activity of WES programmes, with particular attention to building capacity at district and community levels. Existing training activities in integrating water, sanitation and hygiene education undertaken by UNICEF WES section should be expanded to more countries.
5. The cost effectiveness of water, sanitation and hygiene education programmes must be improved if universal coverage is to be achieved. Strategies should include use of low cost and appropriate technologies and designs, community management, community financing or cost sharing where this is appropriate, standardisation of equipment, greater utilisation of the private sector, and improved monitoring.
6. Advocacy must be a central component of water, sanitation and hygiene education programmes. It should focus on increasing global resource allocation for water, sanitation and hygiene education, re-allocating existing resources towards low cost technologies and services for the unserved and underserved. Advocacy must also be undertaken to encourage support for community participation, hygiene education and an intersectoral approach to programming.
7. UNICEF must address the communication issue seriously and establish a set of procedures to guide country-level activities. Budget allocations will have to be made to permit on-going two-way communications between all levels, as well as for conducting communications research essential to ensure that messages are pertinent, accurate and understood. Communications support is also needed to foster advocacy, community empowerment and hygiene education activities.
8. Future plans of action should focus on reaching the unserved and on those with special requirements, including women and female children, and the peri-urban poor.

The workshop was considered by participants to have been extremely valuable in providing discussion between the major international organisations concerned with water, sanitation and health and in providing a clear focus for the future actions.

The workshop was closed by the UNICEF Executive Director, James P. Grant, who confirmed that if countries are to reach the goals they have set for children by the year 2000, water, sanitation and hygiene education will provide the basic stepping stones. "We have come a long way in the last 50 years, but we will not meet the goals by the year 2000 unless we bring basic water supply and sanitation to everyone".

Introduction

The goals of universal access to safe drinking water and safe excreta disposal were set for the International Drinking Water Supply and Sanitation Decade 1981–1990. Although remarkable achievements were made they fell well short of expectations. In 1990, the New Delhi Statement called for a renewed commitment to sustainable water supply and sanitation and for a new approach based on the lessons learned from the previous decade. The guiding principles were to protect the environment and safeguard health through integrated management of water resources and sanitation; to bring about institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour and the full participation of women at all levels; community management of services and strengthening local institutions; sound financial practices and use of appropriate technologies.

A resolution adopted by the United Nations General Assembly in 1991 endorsed these guiding principals and urged governments to assign greater priority to water and sanitation by seeking better integration of the sector within the overall development planning process and to allocate a greater proportion of resources to low income urban and rural areas (A/RES/45/181). The Dublin Statement, issued in January 1992, reinforced the need for planning for health and environmental concerns. The UNCED meeting in June 1992 stressed the environmental importance of protecting fresh water supplies and identified water supply as the major input for improved well-being.

Universal access to safe drinking water and safe excreta disposal by the year 2000 are among the goals set at the World Summit for Children. These goals are embodied in the Convention on the Rights of the Child. Not only are access to safe water and excreta disposal basic human rights and important goals, but they facilitate the achievement of other goals. When hygiene education is included within water and sanitation programmes the impact on health, nutrition and well-being increases dramatically thereby enhancing the achievement of other goals.

This new thinking now needs to be put into practice. To facilitate this UNICEF brought together the world's leading academics, epidemiologists, researchers and planners working in water, sanitation and hygiene education to discuss new strategies for maximising coverage and health benefits (participants are listed in Appendix A).

The workshop was opened by Karin Sham Poo, Deputy Executive Director, UNICEF, New York and the final address given by James Grant, Executive Director, UNICEF, New York. Steven Esrey, McGill University, gave the keynote address and Richard Cash, Harvard School of Public Health and Hygiene, presented the lead paper.

Workshop Objectives

The objectives of the workshop were:

1. To provide a high level forum for inter-agency and inter-sectoral discussion and decision-making on new directions for the water and sanitation sector.
2. To provide recommendations for a UNICEF global strategy for the water and environmental sanitation sector which would include health benefits as a major focus.
3. To discuss the most effective research methods for monitoring and evaluating health and socio-economic benefits of water, sanitation and hygiene education programmes and develop guidelines for undertaking and utilising this research.
4. To encourage effective cooperation between global organisations working in the water, sanitation and hygiene education sector and to find ways to institutionalise this.

The goals of universal access to safe drinking water and safe excreta disposal were set for the International Drinking Water Supply and Sanitation Decade 1981–1990.

To encourage maximum participation and output the workshop was structured around six major topics which dealt with different aspects of the health and socio-economic benefits of water, sanitation and hygiene education programmes.

Workshop design

To encourage maximum participation and output the workshop was structured around six major topics which dealt with different aspects of the health and socio-economic benefits of water, sanitation and hygiene education programmes. These were: health and socio-economic impacts of water; sanitation and hygiene education; planning and measuring hygiene behaviour change; nutrition benefits of water and sanitation programmes; strategies for improving cost effectiveness and coverage; developing a conceptual framework for water and sanitation programmes with a health impact focus; improving planning for health and socio-economic impact. A final session provided a summary and recommendations. A complete agenda is included in Appendix B.

Each session contained two or three presentations, followed by in-depth discussion by small consultative groups each of which focussed on a specific pre-set topic designed to provide clear guidelines for action. Participants selected the topic they wished to discuss from a choice of four. The output from the consultative groups was presented in plenary and discussed. In the final session, recommendations were made and agreed upon.

Report design

The report provides a summary of the presentations and discussion from each session. The guidelines for action, developed by the consultative groups during each session, are presented together in the final section of the report. The report ends with the recommendations arising from the meeting and remarks made by the Executive Director at the conclusion of the workshop.

Summary of introductory remarks and keynote address

KARIN SHAM POO, in the opening address, stressed the important role water and sanitation plays in reaching the goals set at the World Summit for Children. UNICEF is committed to help countries reach intermediate targets of 25 per cent reduction in water coverage gaps and 10 per cent reduction in sanitation gaps by 1995 and full coverage by the year 2000. However, if the strategies of the 1980s continue to be used, the gap between the served and unserved will have widened by the year 2000. Clearly a new approach is needed which incorporates community involvement and cost sharing, the empowerment of women, low cost technology and a focus on processes which lead to health and socio-economic benefits. To assist the challenge, UNICEF plans to increase the proportion of its regular and emergency programme expenditures in the sector from the current level of 16 per cent to 18 per cent by 1995 and 20 per cent by the year 2000.

STEVEN ESREY, in the keynote address, confirmed that provision of water and sanitation have an impact on diarrhoea, nutrition, ascariasis, schistosomiasis, dracunculiasis and trachoma and that these impacts can be increased dramatically if hygiene education is included (Tables 1 and 2). There are probably more health benefits than generally recognised as reduction in disease is usually measured by incidence rather than severity. There may be little reduction in incidence but dramatic reductions in severity which impacts on overall health status and susceptibility to other problems. Another factor which contributes to lack of recognition of the benefits of water and sanitation is that these are lifetime interventions from which individuals and communities benefit from over time. As water and sanitation complement other activities it is hard to measure the full long-term benefits.

There is now clear evidence that sanitation has a larger impact on health than water, and that sanitation and improved hygiene have a more positive impact than water quality. However, convenient access to safe water has health and socio-economic benefits, particularly for women. For example, when water is nearby women spend less time and energy collecting it and more time cooking, feeding and caring for children. Water quality alone does not have

Table 1

Potential relation between water and sanitation interventions and morbidity from selected diseases

	Intervention			
	Improved drinking water	Water for domestic hygiene	Water for personal hygiene	Human excreta exposal
Ascariasis	+	++	–	++
Diarrhoeal diseases	+	++	++	++
Dracunculiasis	++	–	–	–
Hookworm infections	–	–	–	++
Schistosomiasis	–	++	++	++
Trachoma	–	+	++	–

\+ Some impact
++ Considerable impact
– No impact

Source: Esrey et al.

Table 2

Reduction in morbidity and mortality from improved water and sanitation for selected diseases

	All studies Median reduction (%)	Rigorous studies Median reduction (%)
Ascariasis	28	19
Diarrhoeal diseases		
Morbidity	22	26
Mortality	65	–
Dracunculiasis	76	78
Hookworm infections	4	4
Schistosomiasis	73	77
Trachoma	13	27
Child mortality	9	55

Source: Esrey et al.

Health benefits, however, are not automatic and some interventions do not work.

a major impact on diarrhoea because many of the causes of diarrhoea are not water borne. Water and sanitation both have an impact on nutritional status and it is likely that nutrition picks up more benefits than diarrhoea.

Health benefits, however, are not automatic and some interventions do not work. Often there is a poor choice of intervention or in some situations there is no measurable impact because benefits are already there. For example in areas where there are high levels of breastfeeding the additional impact from water and sanitation may be small. Therefore, considerable care must be taken to establish the right indicators for measurement. These must be based on a very good knowledge of the existing situation regarding disease levels, general nutritional status, existing water quantity and quality and existing hygiene behaviour. Careful monitoring of interventions must be undertaken and necessary adjustments made.

Much greater emphasis needs to be given to hygiene and health education for improved hygiene practices. People need to be given information and practical training about the causes of disease so they can make up their own minds. This means much greater involvement with communities.

It is not widely recognised that water and sanitation programmes because they are a felt need within communities and because they offer the opportunity for practical skills in community participation, provide an entry point at community level for other interventions.

Measuring health impact

Summary of presentations

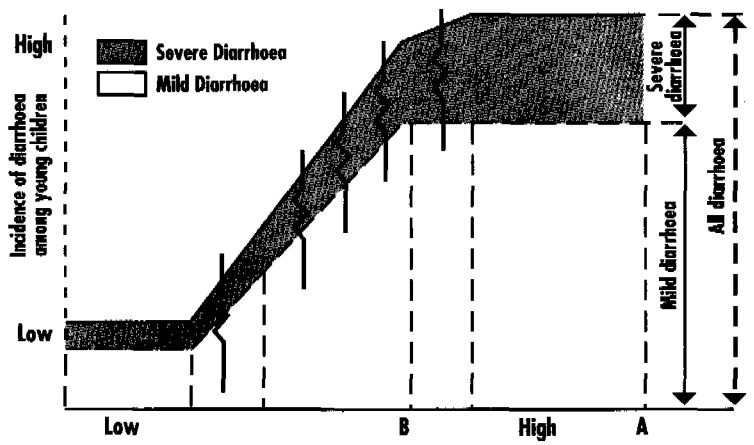
RICHARD CASH demonstrated that water and sanitation facilities are necessary, but not sufficient factors, to bring about improvements in health as improving health can only be realised by achieving significant changes in behaviour. Health benefits will come from water and sanitation programmes but require multiple interventions and time. The potential impact of water supply and sanitation on diarrhoea in certain environments has been overstated because those designing programmes have not fully understood the epidemiology and/or risk factors associated with enteric diseases. In the interim period, process indicators are essential in evaluating these programmes.

Many diseases are influenced by a number of factors, only one of which may be water and sanitation. These factors include previous exposure, immunity levels, susceptibility, number of organisms required to cause the disease, and the ecological setting. Unless these factors are known adequate objectives cannot be established. In the case of diarrhoea a number of studies indicate that quantity of water is more important than quality in determining the incidence and severity. Studies also indicate a clear relationship between the incidence and severity of diarrhoea among young children and the dose level of enteric pathogens ingested. In some programmes the level of contamination may be reduced so as to decrease the incidence of severe illness while the overall number of cases remains the same (Figure 1).

Measuring the health impact of water and sanitation programmes is only useful if it is based on appropriate objectives and uses correct indicators for measurement. In the WES sector there is a general lack of knowledge of epide-

Figure 1

Dose-response relationship for young children under various levels of exposure to an array of enteric pathogens



Source: Esrey et al.

Figure 2

Some effectiveness indicators for a tubewell program

Process Indicators:

- Number of tubewells built
- Down-time of tubewells (weeks/year)
- Spare parts and repair personnel available in the village
- Water quality and acceptability
- Distance to the tubewell and time needed to fetch water
- Availability and type of in-home water storage containers
- Water quantity potentially available – time of day available

Output indicators:

- Percent of households using tubewell water
- Percent of household water consumption provided by tubewell water
- Percent of water consumed from different sources and for what purpose
- Bacterial contamination of domestic utensils
- Hand washing practices
- KAP survey of water use, especially as related to domestic and personal hygiene, before and after intervention
- Willingness of consumers to pay for services

Outcome indicators (medical):

- Incidence of bacterial diarrhoeas (*V. cholera, S. typhi, E. coli* by age)
- Incidence of "severe" diarrhoeas vs. incidence of mild/moderate diarrhoea
- Diarrhoea specific mortality rate
- Incidence of other water-borne diseases (hepatitis A)
- Incidence of water-washed disease (e.g., scabies)
- Cost effectiveness of water program

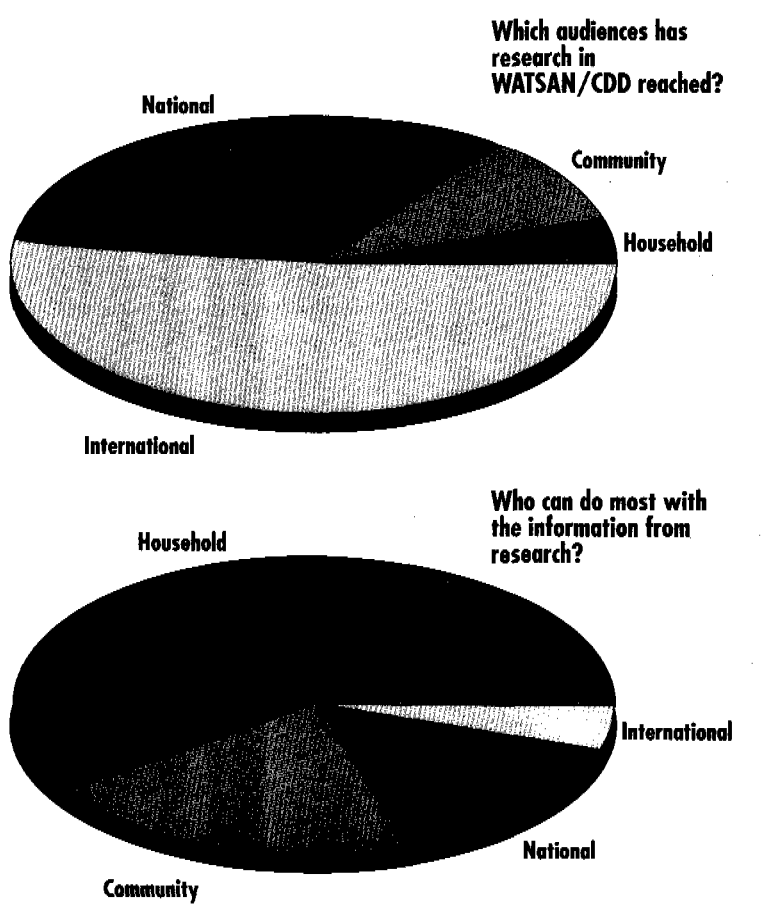
Source: Cash

People are more likely to change their behaviour if they *see* the results of locally relevant research, rather than just being told about it.

miology which results in inadequate goal setting, planning and measurement. It is important to select indicators that make sense. For programmes where the benefit is long-term, these should include process indicators and output indicators. Examples of these types of indicators are listed in Figure 2. Only when this information has been collected is it useful to look at outcome indicators. These might include incidence or severity of diarrhoea; diarrhoea-specific mortality rate; incidence of other water-borne, water-based and water-washed diseases. The time needed to assess health impact is much more problematic as the ecological and cultural setting will have a major impact. For example where tubewells are the only source of water, where education levels are high and funds are available to provide well-designed in-house storage facilities, health impact may be seen in a relatively short period of time. In a situation where there are multiple sources of drinking water, where education levels are low, where poverty exists and infant mortality levels are high, it may take very much longer to see a reduction in incidence or severity of diarrhoea.

Figure 3

Audiences receiving vs. those needing information



Source: Andersson

NEIL ANDERSSON showed that although it was the household that could make greatest use of research into water, sanitation and diarrhoeal disease, results of most research remained at international and national levels (Figure 3). The household is both an important audience for research as well as the most important unit of measurement. UNICEF should support a change of research focus to sub-national and household level. Communities should inform the sector on how to get things to work better at local level. It is important to look at changes in collective household activities and to look behind the indicators. It is also important to be area specific as interventions that work in one place do not always work everywhere.

Because of the complexity of confounding factors and the way in which impacts can be modified by different factors, the value of research may be very local. For example, using lids on water storage jars is found to have a good effect of diarrhoea in one location. This does not mean that using lids will always have the same impact elsewhere. Achieving useful results at local level can be done using a judicious selection of methods and training. UNICEF has now had 10 years experience in this type of research.

People are more likely to change their behaviour if they ***see*** the results of locally relevant research, rather than just being told about it. For example in looking at determinants of diarrhoea among a sample of 2500 children it was found that chlorination of water and construction and use of latrines had a significant impact. This evidence was demonstrated to the community and within three months all unprotected water sources had been chlorinated and there was a programme of latrine construction.

No single research method does the job and it is important to improve capacities in quantative and qualitative methods, including rapid appraisal, household surveys, sentinel sites and use of secondary data. It is important to consider community involvement in mea-

surement. A video is available from UNICEF Evaluation Office, which outlines community-based research methodologies. The same capacities developed to carry out research in water and sanitation can be used in other sectors. Once machinery for community evaluation has been set up it can be used for other sectors.

It is important to measure the cost of the services to the community and the cost of the measurement. We should also measure the cost to the household of ***not*** giving the service.

UNICEF water and sanitation programmes should fit their plans for monitoring, evaluation and research within an overall UNICEF monitoring, evaluation and research plan which focusses on major policy issues, building capacity at national and sub-national levels and being sustainable. It is important that research findings are also used to feed into advocacy and social mobilisation efforts.

SANDY CAIRNCROSS argued that WES programmes should not be measured only on their health impact. Most health impact studies are flawed. It is extremely difficult to provide reliable measurement of health impact and it is usually more useful to measure processes, output, and changes in hygiene behaviour than health impact. Rather than trying to measure the impact of water and sanitation on diarrhoea it is more constructive to ask under what conditions the greatest benefit to health may be obtained. The most significant impacts of disease incidence stem from the behavioural changes which constitute hygiene improvements. If no changes in behaviour result from improved water supply or sanitation, the only health benefits likely to occur are those stemming from improved water quality — in most areas these are negligible.

Unless more is known about the conditions for behaviour change to occur, it is not possible to know how a health benefit can be expected. However studies of human behaviour are possible and studies of behaviour can be carried out more quickly and more cheaply than health impact studies. Measurement of behaviour change will improve the ability to evaluate water, sanitation and hygiene education programmes to make them more effective.

Recent research has shown that the greatest impact can be produced by targeting water and sanitation facilities to those whose existing water sources are furthest away or whose environment is most faecally polluted. There was evidence that in households where water was purchased household income had little impact on the amount of water used (Figure 4) and that in very poor households up to 30 per cent of total household income was spent on water. There is a clear need to focus services on these populations.

Summary of plenary discussion

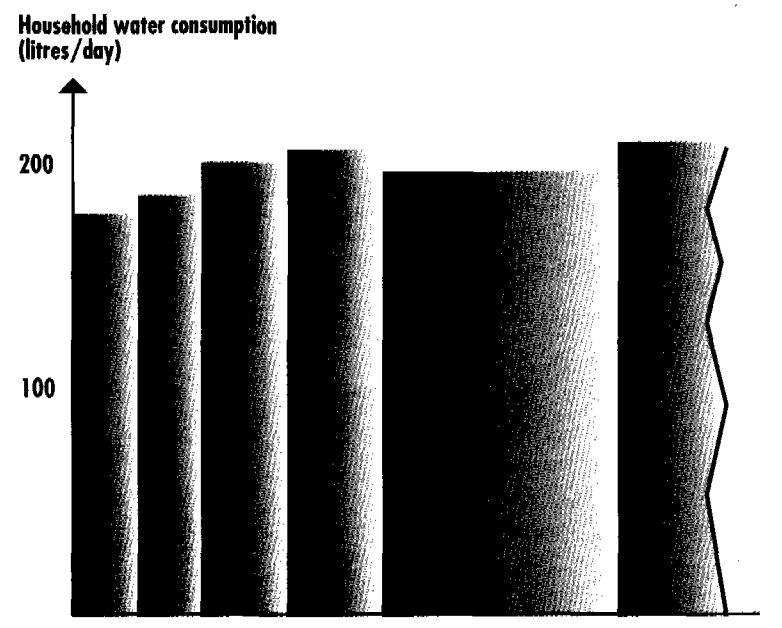
Health and socio-economic impact

1. There are considerable health and socio-economic impacts from water, sanitation and hygiene education programmes. These are often long-term and many benefits are not recognised because objectives and measurement indicators are inappropriate.
2. Benefits are incremental and greatest benefits are derived in the long term from a combination of water, sanitation and hygiene education. These benefits include those of time and income.
3. Hand washing with soap or use of ash have been found to be particularly important in

Recent research has shown that the greatest impact can be produced by targeting water and sanitation facilities to those whose existing water sources are furthest away or whose environment is most faecally polluted.

Figure 4

Household water consumption by household income



Source: Cairncross

Health impact studies are not always useful. They require a thorough knowledge of epidemiology. Process, output and behaviour change studies are probably more useful.

reducing morbidity and quantity of water has been found to be more important than quality in impacting on health because additional water may be used for improved personal and domestic hygiene.

4. Time and cost savings from having easy access to water have socio-economic impacts including improved nutrition.

Health impact measurement

1. Health impact studies are not always useful. They require a thorough knowledge of epidemiology. Process, output and behaviour change studies are probably more useful.
2. If health impact studies are undertaken it is important to set health impact objectives that are realistic and take into consideration the current physical, social and epidemiological situation. It is important to find out how water, sanitation and hygiene education are likely to impact on health in specific locations as impact will vary depending on literacy rate, existing morbidity and mortality, existing location quality and quantity of water available, endemicity of disease and current practice. Setting the right indicators for measurement is of vital importance.
3. Before attempting to measure health impact it is important first to measure processes and output including availability of resources, use of resources and other related behaviours.
4. Health impact objectives must be developed for different circumstances and should be developed in collaboration with other relevant sections. Definitions of access, water quality and quantity should be developed in-country. It is important to consider local capacity, affordability, source, cost of production and willingness to pay.
5. Cutting the cost of water, including distance, may have a very strong impact on health in very poor villages.
6. It is important to involve people in assessing their own problems, seeking solutions and assisting in measurement. Studies related to health and health behaviour are of interest to communities and involving them can result in action. If people are provided with the right kinds of knowledge they can make decisions and act on them.

Changing hygiene behaviour

Summary of presentations

MARIEKE BOOT pointed to the need to establish realistic objectives and indicators for measuring behaviour change. Research from the International Research Centre, The Hague, showed that many behaviours have potential health impact and several behaviour changes are needed to have greatest impact but hand washing and protection of water source are probably the most important.

If behaviour change is to be measured, it is important to specify the exact type of behaviour. For example in hand washing there are many different types of hand washing behaviours including the use of soap or the use of ash. Hand washing may mean different things to different people.

Behaviour change indicators must be developed in a participatory way and used with care. They should be gender specific and include non behaviour indicators. Indicators must be related to the objectives (Figure 5).

In attempting to encourage changes in behaviour it is important not to give people the impression that they are being blamed for existing behaviour. There are usually social and economic constraints which influence behaviour. If the constraints are removed people can more readily make changes.

It is common for hygiene education to focus on women and children, ignoring the fact that men also need to adopt improved hygiene practices and should help train their children. Effective water and sanitation programmes must include a range of behavioural components which take into consideration community beliefs and what is possible with regard to community hygiene, domestic hygiene and personal hygiene (Figure 6).

JIM SHERRY reinforced the need for setting good objectives. These should allow for interaction between environment, individual behaviour and community behaviour and the need to have a thorough knowledge of the consumers and their demands. The impact of water supply on guinea worm depends on the basic situation, including endemicity. This also

Figure 5

Examples of objectives indicators

Objective:	Use of safe drinking water
Indicator:	Easy reach; no unprotected source for drinking; no use of unprotected water
Objective:	All households use sanitary latrines
Indicators:	Presence of latrine; absence of soiling; visits per day by age and gender

Source: Boot, 1993

Figure 6

Dimensions of behaviour

Applicability of particular behaviour
- Is the behaviour applicable?
- Is the behaviour performed?

Features of particular behavior
- What behaviour?
- Who (age, sex, marital status, education, occupation, religion, socio-economic aspects)?
- In what sequence?
- When (what occasion, time of day and year)?
- How much (quantity)?
- How well (quality or degree)?
- Who long (duration)?
- How strongly (intensity)?
- How often (frequency)?
- Where (location)?
- Combined with other behaviours (before and/or after)?

Determinants of particular behavior
- Physical environment
- Economic conditions
- Cultural beliefs and practices
- Household structure/organization
- Community social structure/ organization
- Personal interest

Motivation for particular behavior
- Why (purpose/reasons)?
- Perceived costs and benefits
- Antecedents and consequences of behaviour

Source: Boot, 1993

Each year over 3 million children under the age of five years die from diarrhoeal diseases.

applies to other diseases such as schistosomiasis and trachoma. In the case of guinea worm, if the environment can be modified and access to safe water provided there may be no need to focus heavily on behaviour change. In reducing the incidence of guinea worm it has been important to involve the communities in mapping their water sources and helping them understand the life cycle of the worm and the importance of safe water supply.

DENNIS WARNER and **MAYLING SIMPSON-HEBERT** outlined a proposed hygiene education strategy based on inter-agency collaboration. This would provide better global coordination of hygiene education activities and greater practical support for integrating hygiene education with water and sanitation programmes.

Each year over 3 million children under the age of five years die from diarrhoeal diseases. Many other diseases are associated with unsafe and insufficient water, poor sanitation and personal hygiene practices and a lack of understanding by individuals of what they can do to avoid such diseases. Most episodes of diarrhoea can be prevented through changes in child care practices, many of which are related to personal and domestic hygiene linked to improvements in the water supply and sanitation systems. Improving personal and domestic hygiene has been part of WHO's Programme for the Control of Diarrhoeal Diseases since 1987. It has initiated a research programme to identify what behavioural interventions have greatest impact on prevention of diarrhoeal disease and methods for successful behavioural change.

In 1991 the Community Water Supply and Sanitation unit began a programme on hygiene education for water supply and sanitation projects and began collaboration with the CDD programme and the Health Eduction programme. An international informal consultation was held in 1992 to review knowledge on impact of hygiene related behaviours on diarrhoeal diseases. The most important were:

- Sanitary disposal of faeces;
- Handwashing;
- Safe drinking water; and
- Feeding small children food which is as recently cooked as possible.

Future collaborative activities include research; development of strategies; training; using existing education systems; development of mass media materials; and organisational capacity building.

Summary of plenary discussion

1. We must change from service provision to behaviour change as an important emphasis for WES programmes. Water and sanitation is an on-going process that should lead to an accumulation of knowledge, changes and benefits. It is not just providing hardware. This means we need to establish a better balance between delivery of hardware and the software components including community empowerment, information and education.
2. It is important to reverse current emphasis on "us telling them". It is of vital importance that we start by listening to the communities. To be truly concerned about household needs will require a tremendous change in our mind-set and that of implementing agencies.
3. Communication is essential. There should be structures that allow bottom-up communication and provision of information to communities. Communities must be seen as sources of information. Information ***can*** change behaviour and people have a basic right to information concerning them. Some of this information will be top down. UNICEF will have to address the communication issue seriously and establish a set of procedures to guide country-level activities. Budget allocations will have to be made to cover communication and community empowerment activities.
4. WES is facing the same problems as other development sectors in this area — the need for behaviour change and how to do it. More collaboration is needed with other sectors.

Nutrition impact

Summary of presentations

KUMAR J. NATH presented results of research undertaken in Nepal into the time and energy saved by women following the provision of easy access to water supply. The main observations from the study were that the provision of water supply resulted in an average daily household saving of approximately three hours. The average calories spent per day to fetch water in control villages was 654 k. calories and in project villages, 238 k. calories, an average daily household saving of approximately 350 k. calories. A considerable proportion of the time saved was spent on leisure and provided the opportunity for better child care and education. Reductions in hard physical labour are anticipated to have a positive impact on the health of women and girls.

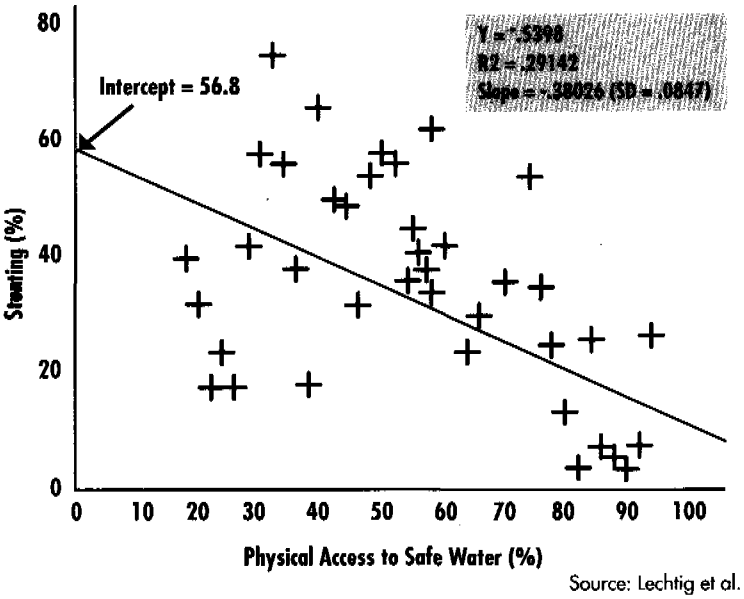
AARON LECHTIG discussed the impact of water and sanitation on malnutrition and mortality of children under five years of age. In countries where water is costly in terms of time and money there are high levels of malnutrition, which exacerbates diarrhoea and vice versa. Provision of inexpensive, affordable access to water, in terms of distance or money, leads to a reduction in the number of diarrhoeal episodes, a reduction in the severity of diarrhoea incidents and improvements in nutrition. This has a long-term impact on the under-five mortality rate (Figures 7 and 8). There is a positive correlation between provision of water and sanitation, and nutritional improvement.

For greatest long-term impact, programmes must be community driven and community based.

The Nutrition Section's planning approach should be used for assessment, analysis and programme implementation. An adapted conceptual framework for analysis of the causes of malnutrition, stunting and death could provide a guideline to implementation of WES interventions in UNICEF-supported country programmes (Figure 9). Highest priority should be given to regions with lowest coverage of safe water and sanitation.

Figure 7

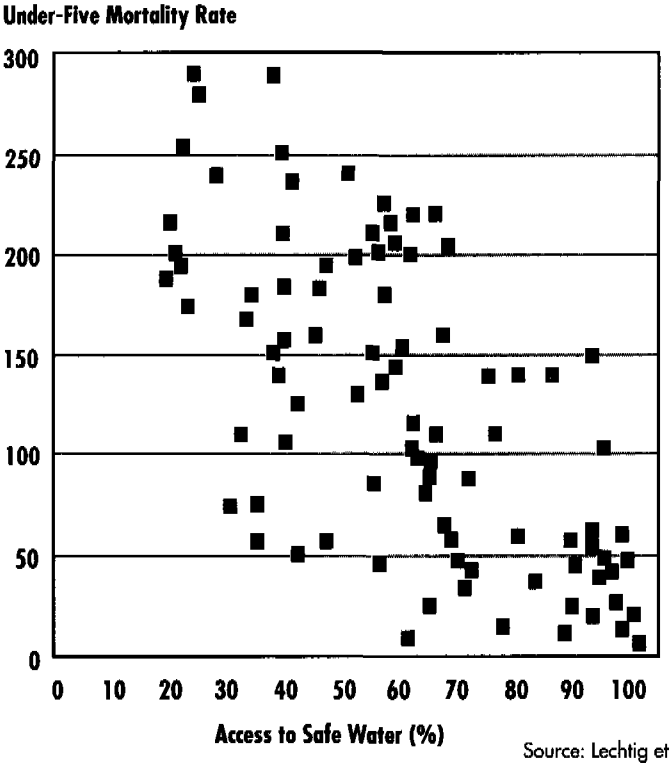
Stunting by physical access to safe water



Source: Lechtig et al. 1993

Figure 8

Access to safe water and U5MR
(N= 96 developing countries)



Source: Lechtig et al. 1993

Changes are required in assessing the benefits of water and sanitation programmes on nutritional status.

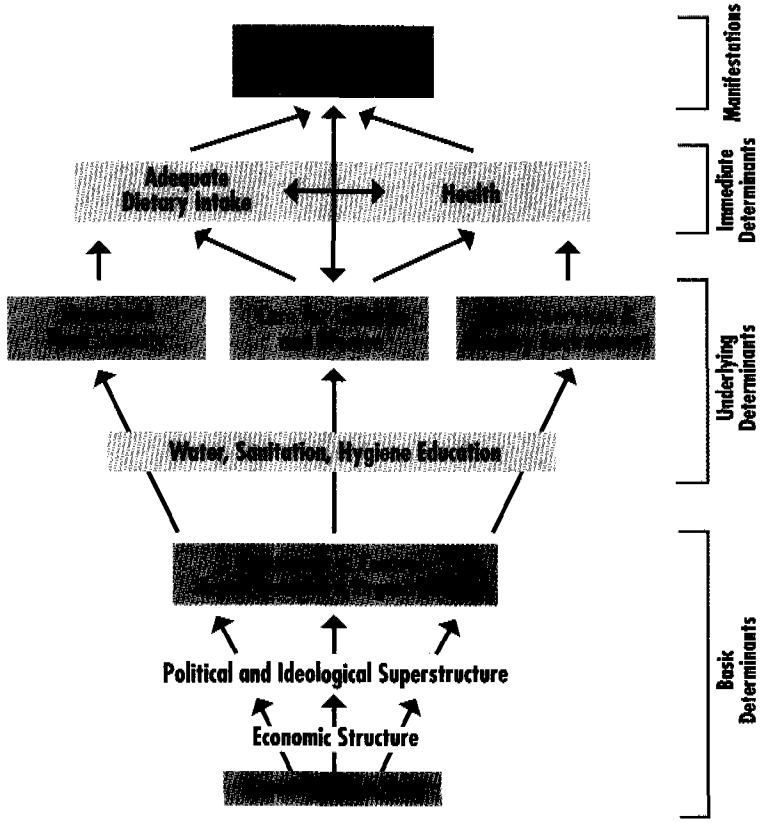
URBAN JONSSON stressed that water was needed for food production, care and hygiene practice. It was also important to have a healthful environment. To date sanitation was added on to water supply. This should be reversed. Supply sanitation and add on water. Nutritional stunting, not diarrhoea, should be the indicator for measuring impact of water supply and sanitation programmes.

Summary of plenary discussion

1. Changes are required in assessing benefits of water and sanitation programmes on nutritional status. There are obviously very clear benefits but these are often long-term and are seldom obvious as diarrhoeal incidence is usually measured rather than nutritional status. However, stunting is a clear indication of poor nutrition.
2. Community-based water, sanitation and hygiene education programmes will contribute to nutritional improvement. Lack of hygiene is one of the most detrimental elements in nutritional status.
3. There is a need for a strong policy statement for introducing water, sanitation and hygiene education into schools and preschools, which includes basic hygiene facilities.
4. Inter-sectoral planning and objective-setting will help re-orient WES programmes to planning for health and nutrition benefits. This can start in the UNICEF office and should be encouraged within government. There are economies of scale and other benefits in joint production and use of the same hygiene education materials. This strengthens messages and avoids confusion. There are good materials available which can be adapted for use in different countries.
5. The time and energy saved by women when water is provided nearer home has a marked impact on nutritional status of women and children. It provides women with more time for child care, cooking and feeding children and for food production or involvement in community affairs. This has an impact on children's health. As female children are also involved in carrying water from a young age, easier access to water will improve their health status and allow time for education.

Figure 9

Determinants of child survival & development



Source: Jonsson, 1993

Developing a conceptual framework for WES

Four groups of participants worked on a conceptual framework for water and environmental sanitation programmes. It was explained that the framework should be based in a theory or premise about the causes of morbidity and mortality among children and in this way linked with the major goals for children. The goal of improved quality of life was given as an outcome and groups were asked to develop a framework based on ways in which water and sanitation could help in achieving this goal. (See Figures 10 to 13.)

Figure 10

WES conceptual framework: Part A

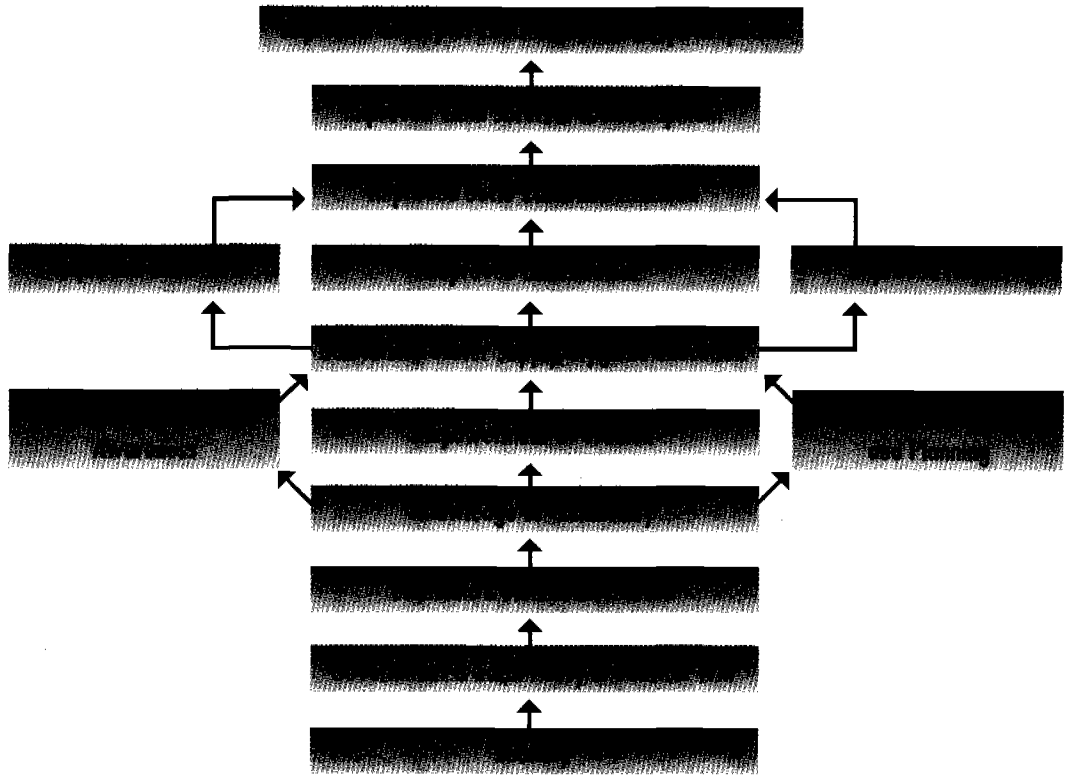


Figure 11

WES conceptual framework: Part B

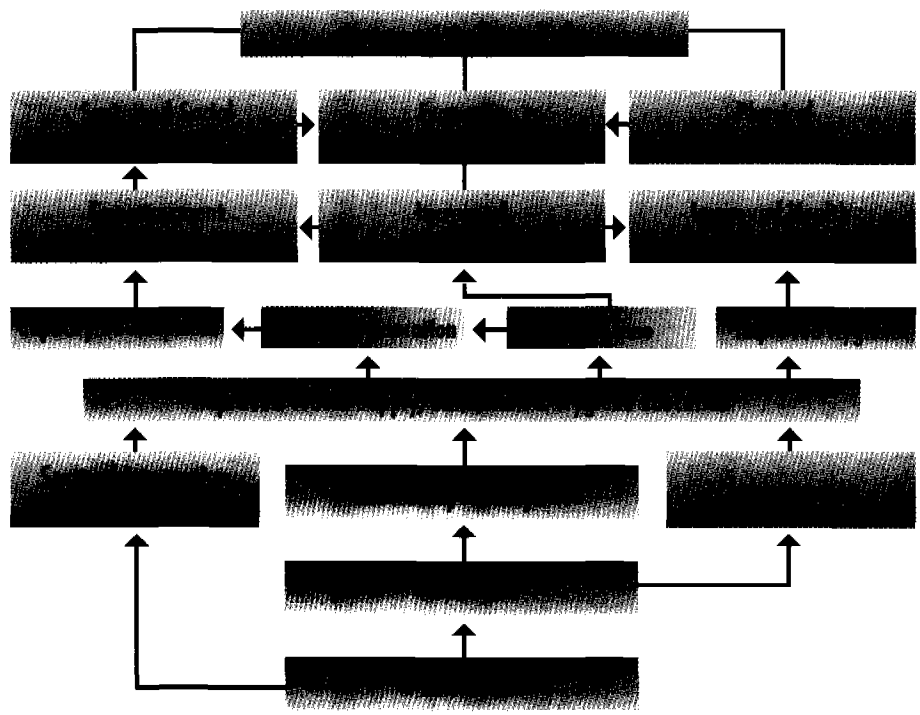


Figure 12

WES conceptual framework: Part C

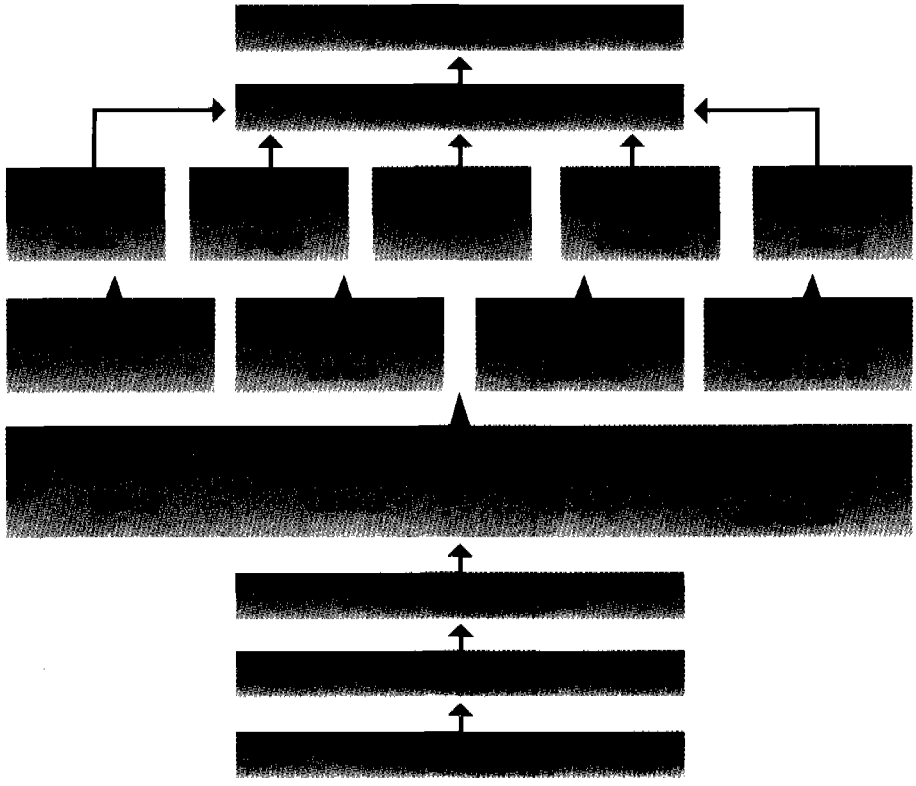
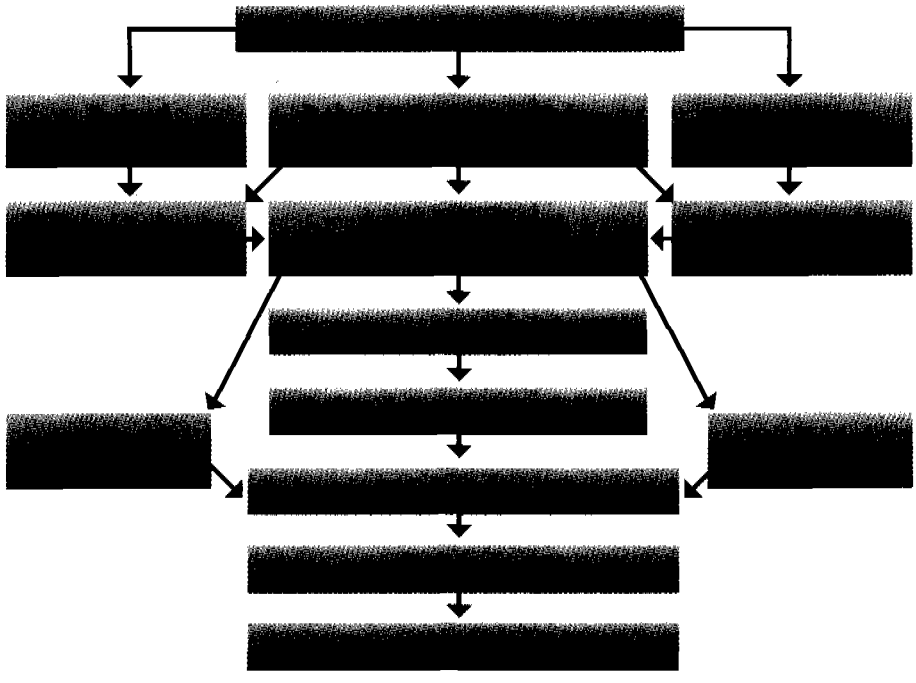


Figure 13

WES conceptual framework: Part D



Improving the cost effectiveness of WES programmes

Considerable cost saving can be made through the use of more low-cost technology, better designs, improving existing resources rather than establishing new ones, encouraging participation of the private sector, standardising equipment and spare parts and involving the community.

Summary of presentations

EDWARD ELMENDORF explained that cost effectiveness can be defined as achievement of objectives with the minimum of resources. In Africa, cost reduction in water and sanitation could be sought through better management, capacity building, improved information and communication, surveys and regional monitoring, local production, tariff reduction and contracting. There is a need for better donor coordination as lack of coordination adds to technical, maintenance and social costs.

In Africa, the per capita expenditures on health vary considerably. Governments share of health expenditure is less than half the total expenditure. There are high donor contributions and high private contributions. The annual per capita household expenditure on health was found to be higher than anticipated. In Ghana the average was $7 per capita, Ivory Coast $19. The question to answer is how can these resources be mobilised more effectively? To provide better health in Africa would cost on average $13 per capita per annum of which $5 would go to basic services, $1.50 on institutional support and training and $6 for incremental interventions like family planning, nutrition, water and environmental sanitation. But can Africa afford it? There is a need for resource re-allocation and for more intersectoral actions, including with water and sanitation. Currently a very high proportion of health spending is allocated to tertiary or curative care with less than 5 per cent devoted to preventive or primary health care. There is clearly need for a better balance here, including provision of water, sanitation and hygiene education.

The options for Africa however are limited. Governments must be involved in deciding on cost issues and making choices. Market scenarios must be considered.

ASHOK NIGAM pointed out that in Africa and Asia, an estimated 1,900 million people need improved water supply and 2,300 million need improved sanitation facilities if the global water and sanitation goals are to be met. In addition, a number of facilities are approaching the end of their useful life and need rehabilitation. Cost effective approaches and innovative financing are needed if the situation is not to deteriorate.

Considerable cost saving can be made through the use of more low-cost technology, better designs, improving existing resources rather than establishing new ones, encouraging participation of the private sector, standardising equipment and spare parts and involving the community. There is a need to reduce the installation costs and to allow communities to select the technology they are most willing to pay for.

Great savings can result from using smaller drilling rigs, reducing the diameter and depth of wells and improving borehole design. Standardisation of drilling equipment, materials and handpumps and spare parts can also considerably reduce operation costs. Economies of scale also reduce costs. Low productivity with high system costs can add to the unit cost of a water point. Cost savings can also be made through improving system management and installation as well as through community operations and management. However, it was important to note wide divergence between the cost of appropriate technologies used in Africa and Asia. As tables 3 and 4 show, costs in Asia are very much lower than those in Africa. Costs also vary considerably within countries and between donors (Table 5).

Using the detailed breakdown of costs of a handpump in a UNICEF-supported programme in Sudan, the author estimates that an 18 per cent reduction in borehole failure rate could reduce capital costs by an equivalent percentage. Taking account of this factor and the possibility of other cost reductions, a 30-40 per cent reduction in per capita costs may not be an unreasonable expectation in many countries in Africa.

It is not always useful to try to compare cost effectiveness of hygiene education versus provision of water and sanitation in terms of lives saved or reduced morbidity in that capital costs are usually cited for water and sanitation, while running costs are cited for health services. The programming objective should be to get an appropriate balance between water supply and sanitation provision and health services, including hygiene education.

A major lesson from the last decade is that it is cost effective in the long term if the community has a sense of ownership of the facilities provided. The community, and particularly women, must be involved at every stage as women are both the primary beneficiaries and supporters of improved water supplies. Community management implies the following steps:

- Management and decision-making;
- Establishment of water committees;
- Education and training;
- Extension services; and
- Provision of water and sanitation and hygiene education in schools.

Summary of plenary discussion

1. Measuring cost effectiveness requires a comprehensive view which considers all costs at all stages — input, output, communication, and training — at donor, government, province, community, and household levels. Measurement of cost effectiveness must include costs of maintenance and costs to the community and should be related to appropriate outcome indicators. But we do not know how to measure cost effectiveness adequately. This needs to be looked into further through research.
2. Donors and programme implementers must keep in mind who determines what is cost effective. Indicators must change when people's perspectives are considered as determining factors. Ways should be found to measure user satisfaction.
3. A very strong emphasis must be given to community involvement from the planning stage on. It is not possible to improve cost effectiveness in the long term without community involvement. However, incorporating full community decision-making demands changes in the programming process. Practical application of community participation must be discussed.
4. The private sector must be involved, where this is practical, as governments may have

A major lesson from the last decade is that it is cost effective in the long term if the community has a sense of ownership of the facilities provided.

Table 3

Estimated capital cost of providing rural and peri-urban water supply and sanitation in Africa and Asia by the year 2000

	Africa			Asia			Total		
	Population to be covered (millions)	Per Capita Cost (US$)	Total US$ ea.	Population to be covered (millions)	Per Capita Cost (US$)	Total US$ ea.	Population to be covered (millions)	Total US$	Annual Cost US$
Water Supply									
Rural	348	32	11.13	818	6	4.91	1166	16.04	2.0
Peri-urban	130	95	12.35	312	6	1.87	442	14.22	1.8
Total	478		23.48	1130		6.78	1608		3.8
Sanitation									
Rural	417	10	4.17	1209	4	4.84	1626	9.01	1.1
Peri-urban	134	25	3.35	305	4	1.22	439	4.57	0.6
Total	551		7.52	1514		6.06	2065	13.58	1.7

Source: Nigum and Heyward, 1993

little incentive to reduce costs, or the capacity to accelerate service coverage. The private sector is more sensitive to costs.

5. A legal framework must be in place to ensure effective delivery and involvement of the private sector.
6. UNICEF must promote better accountability both within government, the community and the private sector, and must discuss costs and choices available with government as well as with the community.
7. Work must go into improving donor coordination with regard to cost effectiveness. Current discord between donors adds to costs.

Table 4

Inter-country comparison of costs of drilled boreholes with handpump
(Cost figures in US$)

	Pakistan	Sudan	Benin	Uganda
Capital Costs:				
Staff	395	1062	2166	2094
Material	807	1598	1850	2142
Contracts/Consultancy	359	–	–	–
Depreciation & Support Costs	436	1459	2244	2608
Total (unit cost per borehole)	1997	4119	6260	6844
Cost per capita	10.00	20.60	12.52	22.81
Number of successful boreholes	108	343	122	245
Number of beneficiaries per borehole	200	200	500	300
Average depth (meters)	30	58.87	57.5	88.6
Cost per meter drilled	50	64	109	71
Failure rate (Unsuccessful boreholes/ total drilled)	4.4%	28%	17.6%	7.5%
Community involvement	Poor	Poor	Poor	High
Delivery Mechanism	Govt. Team	Govt. Team	Govt. Team paid by Community	Local Contractor

Source: Nigum and Heyward, 1993

Table 5

In-country and cross-country cost of borehole with handpump
(Cost figures in US$)

	Benin				
Programme Support	UNICEF	Japan	France Atacoro	France Mono	France S. Borgon
Unit Cost/Successful Borehole	6260	46,486	17,000	15,000	14,400
Per Capita Cost	12.52	60	27.86	24.58	23.75

	Pakistan	Sudan			Uganda
Programme Support	UNICEF	North Kordofan UNICEF	South Kordofan UNICEF	Global Kordofan UNICEF	UNICEF
Unit Cost/Successful Borehole	1997	4119	2535	2970	6844
Per Capita Cost	10	20.60	12.67	14.85	22.81

Source: Nigum and Heyward, 1993

Improved planning for health and socio-economic impact

Summary of presentations

MAY YACOOB highlighted some planning contradictions in approaches to community development. Is sustainability possible while institutions have little to do with communities and community-level decisions and communities cannot penetrate institutions? This is a major impediment to long-term sustainability, demonstrating a need for a much closer relationship between communities and institutions, as well as a need for a multi-disciplinary approach. For WES programmes to be sustainable, decisions made at community and government policy levels need to be based upon ongoing information exchange. This interaction will influence changes in behaviour at both levels (Figure 14). Without this interaction community-based initiatives do not survive.

Sustainable community programmes are hindered by district level government staff who do not know how to deal with community involvement and management and do not want to work at this level. Training for district level staff in process skills including facilitation, problem solving, and communications is imperative. Training should be on-going and demand practical activities at community level. However, before this can be effective, district level staff must have some incentive to work at the periphery.

Health workers need to understand disease and have the ability to identify high risk conditions, to gather field data, to analyse the frequency of occurrence, the reasons for it and to make adjustments. They also need to be able to see cause and effect from the people's perspective.

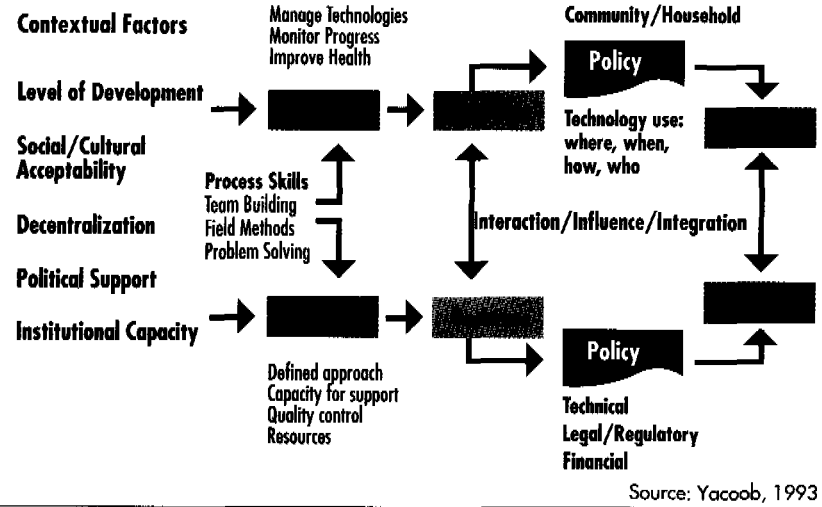
No community-based programmes will succeed without political support and without being culturally and socially acceptable to local populations. Health interventions must take into account community preferences and socially and culturally determined behaviours. These issues all have serious planning implications.

ROBERT LEDOGAR and **CAREL DE ROOY** reviewed the WES component in National Plans of Action from 40 African countries. These showed clearly that there has been a considerable change in thinking away from purely hardware approaches to those that included hygiene education and behaviour change. Their review showed that sanitation targets were generally much lower than those for water. There was widespread endorsement for community participation, low cost technologies and cost recovery for operations and maintenance. Community participation is seen as an opportunity for an integrated strategy on water and sanitation but there is a tendency for community participation to be seen as resource-saving rather than empowerment and a

Sustainable community programmes are hindered by district level government staff who do not know how to deal with community involvement and management and do not want to work at this level.

Figure 14

Interaction between institutions and communities



Source: Yacoob, 1993

Agreement needs to be reached on approaches and methods for involving communities.

means of long-term sustainability. Most national plans of action base their sanitation strategy on social mobilisation but provide few action plans for implementation.

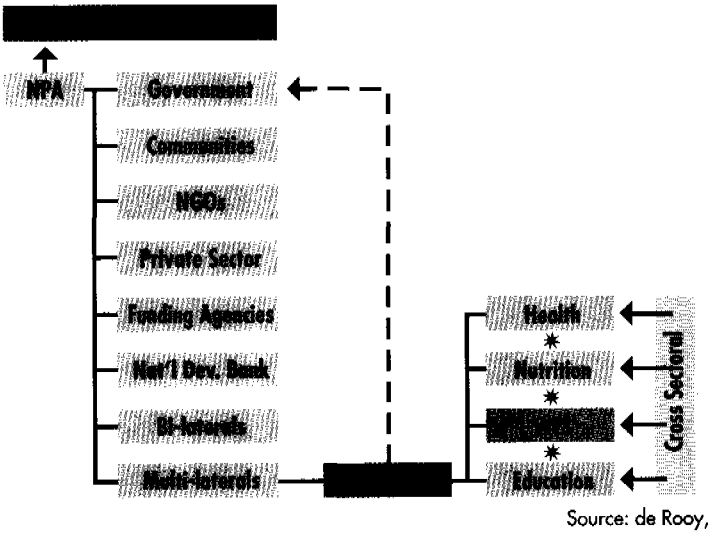
Many countries set unrealistic goals and few had strategies for resource mobilisation. The need for inter-sectoral action was not fully appreciated.

Changes in strategies are required to achieve full coverage. For example, if resource allocation was restructured towards low cost options there would be adequate resources to provide 80 per cent of coverage needs. Increased community contributions will significantly reduce the government burden and increase sustainability.

The review shows that the national plans of action (NPA) provide the opportunity to institutionalise inter-sectoral planning as well as for developing standard indicators for measurement. It also allows identification of areas for NGO collaboration, private sector involvement and areas for cost saving (Figure 15).

Figure 15

The position of UNICEF Water and Environmental Sanitation Sector in National Programming



Source: de Rooy, 1992

Summary of plenary discussion

1. Agreement needs to be reached on approaches and methods for involving communities. This will need to include training, allocation of logistical support, political support, effective health education, and effective monitoring. Communities have excellent coping mechanisms which should be taken into consideration. We should work more closely with communities to assist them take part in the planning process.
2. More support should be given to district level as this is where real technical and management skills are particularly needed. District level training in planning is also required. However, training alone will not change behaviour — a reward system is needed.
3. National plans of action (NPA) should include a range of donors — bilateral, multilateral and NGOs. NPAs have potential for inter-sectoral action and are a good place to relate WES to other sectors, e.g., poverty, education, health, urban issues.
4. NPAs should be used as an instrument for advocacy at all levels and support should be given for these advocacy activities.
5. Planning processes need to be reviewed and more consideration given to inter-and intra-sectoral planning. The NPA provides opportunities for this and this approach should be followed up.
6. As the complexity of WES programming increases, roles of country representatives become even more critical. Representatives will be able to cut across sectors to develop an integrated approach with partners and counterpart agencies.

Guidelines for action

Output from group consultation

Actions for maximising hygiene education and hygiene behaviour change in WES programming

1. Plan for and provide budget for research which will identify existing beneficial behaviours and knowledge to build upon. Use household and community research. Ensure that data collected is disaggregated by gender, where this is appropriate. Consider how necessary information can be obtained with community involvement. Support training of local investigators in using focus group discussions, structured observation and other research methods. Develop questions that help guide these observations. Dialogue between field workers and investigators is important. Plan the programme ***after*** this information has been collected and analysed.
2. As sound hygiene behaviour is established during youth, WES programmes should focus on improving key hygiene behaviours among children, starting with pre-school children, and then placing a major emphasis on school-aged children.
3. Programmes should focus more on women and provide opportunities for women to be involved in decision-making and planning. Women's existing workloads should be taken into consideration and labour-saving technologies introduced where these are feasible. UNICEF involvement of women should start by including more women and more health educators on UNICEF WES teams. Inter-disciplinary teams are needed at all levels and stronger multi-disciplinary approaches must be developed.
4. Guidelines for integration of water, sanitation and hygiene education should be established within UNICEF and greater resources allocated to the sector. More effort should go into advocating for resources for software elements. All staff, especially representatives, must be sensitised to these needs.
5. To bring about desired behaviour change, programmes must specifically identify behaviour change targets at household and other levels. Special effort will have to be made to change behaviour and attitudes of peer groups, programme managers, policy-makers and mid-level managers. UNICEF country representatives should advocate strongly for these changes, starting in their own offices.
6. Community participation in decision-making, planning, implementation and management must be built into the programme.
7. An inter-sectoral approach must be established. WES should look and work outside the sector as there are a number of possible spin-off benefits. Better linkages between health, nutrition and education need to be established and reflected within UNICEF WES programming. This should be facilitated by the country representative and senior WES staff.

Plan for and provide budget for research which will identify existing beneficial behaviours and knowledge to build upon.

A good cost effective technical programme is important to generate confidence but to be effective it should include software approaches.

Action points for inclusion in a global policy statement for water and sanitation programmes

Elements of a policy statement should include:

1. To achieve maximum impact from water and sanitation programmes, hygiene education must be included. Water, sanitation and hygiene education need to be integrated at all levels, and involve planners, implementers, and consumers. Objectives must focus on behaviour change.
2. Plan water and sanitation programmes as a process that combines hardware and software approaches. Cost-effective technical programmes are important to generate confidence but, to be effective, they should include software approaches.
3. Facilitate better communication. Effective behaviour change needs ***communication*** in both directions. Communication is a process which needs participation, ***not posters alone***. Posters are useful only as teaching aids. Support research to develop and refine these methods.
4. WES can benefit from linkages with other sectors. This needs to be institutionalised and guidelines provided.
5. Advocate and plan for community participation in WES programmes. This will also benefit other sectors.
6. Country representatives should encourage and support inter-sectoral programming.

Figure 16

WES programming planning and its consequences

I. Efficiency			II. Effectiveness	III. Impact
Project Inputs	**Supporting Conditions**	**Project Inputs**	**Behavioural Changes**	**Health and Socio-Economic Benefits**
National Government	Plan	Quality	*Individual Behaviour*	Health
External Donor	Design	Quantity	• household safe water use	Social
Community	Construction	Knowledge	• household latrine use	Economic
	Training	Access	• hand washing	
	Legal	Reliability	• hygienic food preparation	
	Operation & Maintenance		*Community Behaviour*	
			• system management	
			• system maintenance	
			• school curriculum	
			• commercial water use	
			• protection of supply	

Guidelines for setting generic behaviour change objectives for WES programmes

1. Behavioural objectives must be specific for each level — individual/household/group — and for different locations, depending on social, economic and political situations. Gender issues should be kept in mind.
2. Focus on actions to break the chain of disease transmission. These may be: faecal-oral; safe excreta disposal; hand cleaning; water source protection; safe food handling; faecal-skin transmission or skin-skin transmission. The major focus will differ in differing situations.

Actions for improving cost effectiveness in UNICEF country offices

1. UNICEF country programmes need to modify cost measures to include cost to users, community, government and donors rather than just donors. Cost must cover time spent planning with beneficiaries, installation, operations and maintenance, training, community involvement and other processes. Cost must be related to desired outcome, e.g., per capita increase in water use, per capita increase in safe excreta disposal. Indirect measures or indicators can also be used.
2. UNICEF offices must be aware of the crucial influence of technical choices and designs, and should ensure that communities are involved in these decisions. UNICEF/government should provide options, not prescriptions, and must be aware of what the communities are willing to pay.
3. The UNICEF office should present government and communities with different cost options and assist them in making decisions.
4. Private sector involvement should be promoted to reduce costs where this is appropriate and feasible. When the cost of the private sector is high, UNICEF should demonstrate how it can be reduced.
5. UNICEF should foster donor coordination on the issue of costs as these can vary considerably for the same activities and equipment in different programmes/projects.
6. Programming and budgeting must allow for community participation, capacity building and empowerment of women.

Cost must cover time spent planning with beneficiaries, installation, operations and maintenance, training, community involvement and other processes.

Governments sometimes do not want to relinquish political control or to overburden communities with the full responsibilities of community decision-making, maintenance and operation.

Overcoming major constraints to improving cost effectiveness

Major constraints:

- There are difficulties in measuring cost because of different roles of government and donors. Government may be hesitant to introduce low cost technologies.
- Governments sometimes do not want to relinquish political control, or may overburden communities with the full responsibilities of community decision-making, maintenance and operation.
- There is excessive centralised decision-making; lack of community involvement, ownership, and finance; and poor accountability and monitoring.
- Rewards and achievements are measured by construction rather than functioning services.
- Although obtaining information on use and coverage is difficult, it is essential for judging cost effectiveness, and therefore must be obtained.

Some solutions:

- Support more and better operational research, as well as more advocacy, training and sensitisation.
- Fully and effectively involve the community in decision-making, financing, and maintenance.
- Develop improved indicators of performance, including coverage and usage, using community-based monitoring and reporting, and rapid assessment procedures.
- Introduce revised reward and acknowledgement systems for implementors and managers that include rewarding applying "software" elements, e.g., extent to which systems are utilised or are functioning.
- Promote partnership with NGOs as a means of involving the communities.
- Give greater support for capacity building at all levels but particularly at district level.

Guidelines for decentralising responsibility for water and sanitation programme implementation

1. Undertake long and short-term situational analyses with regard to technical, socio-economic, culture, gender, financial, legal and administrative factors.
2. Build on the existing system by: strengthening and broadening it through finding new partners; focussing on the role of women; and finding ways to encourage a more equitable sharing of the workload with men.
3. Over the long-term, continue to encourage structural change, institutional reform and capacity building. Encourage legal reforms and policy changes which favour more equitable distribution of resources, use of appropriate technologies and greater control over services and resources at community level.

Guidelines to involve the private sector in water and sanitation provision

Legal	Legal framework for private sector involvement must exist and must facilitate public-private interfacing.
	Unfair monopolistic practices should be controlled.
Financial	Private sector involvement requires appropriate incentives. These should be structured to enhance provision of services.
	Water and sanitation rates should be affordable.
	Advocate for cross-subsidies where necessary and feasible.
Institutional	Private sector should work closely with communities and local institutions and be accountable to them.
	For WES utilities, the community should be involved in all aspects of decision-making, e.g., system expansion, water rates, hiring practices, etc.
Private sector	Private sector should support capacity building in the community (e.g., human resource development, research and development, hygiene education).
Technological	Technology and service levels should be consistent with that desired by users.
	Technologies should be fundamentally sustainable.
	Operations and maintenance of systems should involve users.

Private sector involvement requires appropriate incentives. These should be structured to enhance the provision of services.

The goals and objectives for WES should incorporate a health and socio-economic focus and should be developed jointly with other sectors.

Guidelines for incorporating socio-economic and health impacts into planning

1. WES planning should not be undertaken independently but in cooperation with other agencies as part of overall health and socio-economic planning, including agriculture, environment, and education. Planning should therefore be inter-sectoral and participatory with feedback mechanisms from all levels including users.
2. The goals and objectives for WES should incorporate a health and socio-economic focus and should be developed jointly with other sectors.
3. Specific objectives should: be quantifiable; be user-oriented and not merely seek physical construction; include behavioural elements; be cost conscious and analytical; include a focus on disadvantaged populations such as peri-urban areas, women and female children and the rural unserved; be gender specific, outlining an equitable distribution of women's workload; and be based on a careful analyses of the existing physical and social situations.
4. Plans must reflect a better balance between hardware and software targets, indicating clearly what needs to be done and how.
5. Regular inter-sectoral, inter-agency meetings should be held at all levels to allow better planning and monitoring.
6. Social mobilisation, advocacy and other communication elements which focus on hygiene behaviour change and community involvement must be integrated into sector planning and adequately budgeted for. Social mobilisation and communication objectives should be developed.
7. Identify joint activities in which donors, implementers and community have an interest e.g., monitoring and surveillance, training, water and sanitation for schools and health centres.
8. Provide more support for countries in developing WES national plans of action.

Main points for inclusion in a global WES strategy

1. WES should integrate water, sanitation and hygiene education and give greater emphasis to software and processes. Provision of hardware should serve community needs, be affordable and sustainable.
2. Intra-sectoral linkages need to be established in-house and strengthened between agencies and within government. National plans of action should be used as a means of achieving this. An institutional framework should be developed and included in the strategy. The strategy should allow for NGO and private sector cooperation, and for development of public/private sector networks.
3. The strategy should target deprived areas and give special focus to benefits for women and women's involvement. Hygiene education should be given to men as well as women.
4. Communities should not only be a focus of data collection but also take an active role in such investigations, as well as in resulting programme planning, management, measurement and adjustment. Community should also be central to capacity building efforts. Decentralisation and institutional restructuring are necessary to achieve this.
5. Advocacy is a vital component for the WES strategy. Advocacy is needed for additional resources for WES; for re-allocation of current resources towards the unserved and underserved; for greater support for community participation and the full participation of women; for capacity building and for low cost technologies.
6. The strategy should include a conceptual framework which looks beyond the World Summit for Children goals and is concerned with sustainable improvements in human well-being. The conceptual framework should be based on the premise that water, sanitation and good hygiene are fundamental to achieve many World Summit for Children goals.
7. The strategy should allow for goals which incorporate sustainable health and socio-economic benefits from water and sanitation programmes.

WES should integrate water, sanitation and hygiene education and give greater emphasis to software and processes.

UNICEF and other agencies should help national governments establish the practice of starting with the communities.

Actions for putting the major decisions of the workshop into practice

1. General recommendation

- UNICEF and other agencies should help national governments establish the practice of starting with communities. This should begin with planning for on-going advocacy at national and provincial levels in support of full community participation.

2. Specific recommendations

- Strengthen district-level WES institutions through capacity building in all areas. Develop district-level skills in communications, problem solving and facilitation so the district level staff can better appreciate and respond to community demands and felt needs; work with the community in developing solutions to its WES needs; cooperate with the community in implementing their solutions.
- Develop and support training programmes for trainers and animators in community organising, community empowerment and communication skills.
- Develop training programmes for women and provide support for women as programme managers.
- Help national governments to adopt hygiene education as an equally important component as hardware by providing advocacy at the decision-making level and on-going support for hygiene education activities. Use positive health impacts of hygiene behaviours as a tool. Highlight the need for health education specialists at all levels, but starting at the top.
- Develop action-oriented programmes that include health-related activities. Plan for and provide budget support for health education from the start.
- Develop guidelines for reviewing all WES programmes to ensure the adequate inclusion of community and gender concerns.
- Provide the WES training course, "Water, Sanitation and Hygiene Education" to all WES staff and counterparts.

Workshop recommendations

The following recommendations were made in plenary. They cover five major areas of focus: empowerment, capacity building, service delivery, intra and intersectoral linkages, and advocacy.

Community participation in decision-making, planning, design, management and evaluation should be fundamental to water and sanitation programmes, giving particular attention to empowering women at all levels.

Empowerment

1. Community participation in decision-making, planning, design, management and evaluation should be fundamental to water and sanitation programmes, giving particular attention to empowering women at all levels. Supportive guidelines should be provided and a special strategy developed to cover women's involvement in WES decision-making, planning and management at all levels. Special efforts should be made to include more women in WES teams.

Capacity building

2. Capacity building should be a major focus and on-going activity of WES programmes, with particular attention to building capacity at district and community levels. Capacity building activities should include training in hygiene education, communication skills and community organising. Existing training activities in integrating water, sanitation and hygiene education undertaken by UNICEF WES section should be expanded to more countries.
3. Water and environmental sanitation programmes should be re-oriented to include goals and objectives which focus on health, behaviour change and socio-economic impacts. These objectives should be based on a thorough assessment of household and community situations and appropriate indicators established for monitoring and evaluation.
4. UNICEF should increase its support for water, sanitation and hygiene education to 20 per cent of budget. Water, sanitation and hygiene education are basic inputs to the achievement of the Goals for the 1990s and WES is an important political and social tool for achieving other global goals.
5. As hygiene behaviour is learned during youth, the WES sector should put greater emphasis on sanitation and hygiene education in pre-schools and primary schools. A special strategy should be developed in collaboration with education and other appropriate sectors.
6. Strategies for more cost effective programmes should include low cost and appropriate technologies, more efficient installation and use, community management, community financing where appropriate, standardisation of equipment, greater private sector utilisation and effective monitoring.
7. More support should be given to national water and sanitation sector monitoring, given the strategic importance of using relevant, up-dated information for sector planning, management, resource targeting, policy formulation, strategy development and advocacy for fund raising. Capacity building in monitoring and evaluation skills should be pursued.

Hygiene education must be an integral part of future water and sanitation programmes and the approach to water, sanitation and hygiene education intra-sectoral and inter-disciplinary.

Service delivery

8. Water, sanitation and hygiene education must be seen as an on-going process that leads to an accumulation of benefits over time. A balance must be established between service delivery and process requirements. UNICEF should provide an example for others to follow.
9. The cost effectiveness of water, sanitation and hygiene education programmes must be improved if universal coverage is to be achieved. Strategies should include use of low cost and appropriate technologies and designs, community management, community financing or cost sharing, standardisation of equipment, greater utilisation of the private sector, and improved monitoring.
10. Future plans of action should focus on reaching the unserved and on those with special requirements including women, female children and peri-urban poor.
11. Future planning should be based on household-level research which involves the community and feeds back information to communities. Training in appropriate research methodologies should be supported. Action-related community research must be pursued and funded.

Linkages

12. Hygiene education must be an integral part of future water and sanitation programmes and the approach to water, sanitation and hygiene education must be intra-sectoral and inter-disciplinary. Inclusion of professional social scientists within the water and environmental sanitation sector should be promoted.
13. Guidelines should be established for institutionalising inter-sectoral and inter-disciplinary research, planning, implementation, training, monitoring and evaluation, and more funding provided for these activities. These must be securely linked to enhancing sustainability and improved hygiene practices.
14. Better cooperation should be sought between international agencies and non government organisations working in water, sanitation and hygiene education.

Advocacy

15. Advocacy must be a central component of water, sanitation and hygiene education programmes. It should focus on increasing global resource allocation for water, sanitation and hygiene education, for re-allocating existing resources towards low cost technologies and services for the unserved and underserved. Advocacy should also be undertaken to encourage support for community participation, hygiene education and an intersectoral approach to programming.
16. UNICEF must address communication issues seriously and establish a set of procedures to guide country-level activities. Budget allocations will have to be made to cover communication and community empowerment activities.
17. A common set of practical guidelines in hygiene education and advocacy must be established for multi-national organisations working in water, sanitation and hygiene education. Advocacy must be undertaken on a global level by all organisations to secure greater allocation of resources and to change the focus away from delivery of hardware.

Closing remarks

In his closing address, Mr James Grant highlighted the following points:

If we are interested in bringing progress through achievement of the goals, people must have ready access to water and an orderly system of sanitation. Water has many benefits and the biggest health advance of the previous 500 years was understanding the importance of hand washing and breaking the cycle of disease.

We have come a long way in the last 50 years. One of the most important lessons learned over this time has been the need for hygiene education. Correct use of water is learned through hygiene education which leads to behaviour change. Hygiene education comes through many channels — through religious leaders, through social groups, through schools. We must mobilise all these individuals and institutions to support good hygiene.

Water and sanitation have multi-sectoral benefits and investment in water and sanitation has high health payoffs and high nutrition payoffs. These benefits are greater if the people understand the importance of keeping water clean, of washing hands, of sanitary disposal of faeces.

The 1990s present us with an opportunity to improve the well-being of the majority of families through the provision of water and sanitation services. This can be done by focusing on the rural and peri-urban poor; employing low-cost and appropriate technologies on a massive scale; promoting the participation of households and communities in planning, implementing, financing and maintaining water and sanitation projects.

We have a choice. We can continue with business as usual, neglecting the poor majority, or we can shift our focus to providing some for all, rather than more for some. By opting for the latter, we can help shape a better and more just new world order and contribute to environmental sustainability into the 21st century.

We have a choice. We can continue with business as usual, neglecting the poor majority, or we can shift our focus to providing some for all, rather than more for some.

Appendix A

List of participants

Planning for health and socio-economic benefits in the water and sanitation sector, 21–22 April 1993

1. Dr. Steven Esrey, Professor, Mc Gill University, Canada
2. Dr. Richard Cash, HSPH, Harvard School of Public Health, Massachusetts
3. Prof. Kumar J. Nath, Director, All India Institute of Public Health & Hygiene, Calcutta, India
4. Mr. A. Edward Elmendorf, Principal Management Specialist, Health & Nutrition Division, World Bank, Washington D.C.
5. Ms. Letitia Obeng, Environmental Specialist, Infrastructure Division, World Bank, Washington, D.C.
6. Ms. May Yacoob, Task Manager, Anthropology and Behavioural Science Section, WASH, Virginia
7. Mr. Dennis Warner, Manager, CWS, WHO, Geneva, Switzerland
8. Ms. Mayling Simpson-Hebert, Technical Officer, CWS, WHO, Geneva, Switzerland
9. Mr. Hans van Damme, Director, International Reference Center for Community Water Supply and Sanitation (IRC), The Netherlands
10. Ms. Marieke Boot, Training Researcher, IRC, The Netherlands
11. Dr. Michael Sachs, Sr. Health Adviser for DGIP, UNDP, New York
12. Ms. Pamela Thomas, Consultant, Australia
13. Mr. Manuel Rojas Buvinich, Consultant, Honduras
14. Dr. Endag Ahadi, YIS Foundation, Jakarta
15. Dr. Fernando Barros, University Federal of Pelotas, Brazil
16. Dr. Cesar Victora, University Federal of Pelotas, Brazil
17. Mr. James P. Grant, Executive Director, UNICEF New York
18. Mrs. Karin Sham Poo, Deputy Executive Director, Operations, UNICEF New York
19. Dr. Nyi Nyi, Special Assistant to the Executive Director, UNICEF New York
20. Mr. Kul Gautam, Director, Programme Division, UNICEF New York
21. Mr. Manzoor Ahmed, Associate Director, Programme Division, UNICEF New York
22. Mr. Karl-Eric Knutsson, Regional Director, UNICEF ROSA, Kathmandu
23. Mr. Cole Dodge, Regional Director, UNICEF ESARO, Kenya
24. Mr. Baquer Namazi, UNICEF Representative, Egypt
25. Ms. Rima Salah, UNICEF Representative, Burkina Faso
26. Mr. Steven Woodhouse, UNICEF Representative, Vietnam
27. Ms. Marilyn Dawson, Programme Officer, Asia Section, UNICEF New York
28. Mr. Ezio G. Murzi, Chief, MENA Section, UNICEF New York
29. Dr. James Sherry, Senior Adviser, Programme Strategy, UNICEF New York
30. Mr. Robert Ledogar, Sr. Planning Officer, Planning and Coordination Office, UNICEF New York
31. Mr. Urban Jonsson, Sr. Adviser, Nutrition Section, UNICEF New York
32. Mr. Anthony Hewett, Chief, Programme Communication/Social Mobilisation, UNICEF New York
33. Ms. Ute Deseniss-Gros, Programme Officer, Programme Communication/ Social Mobilisation, UNICEF New York
34. Dr. Monica Sharma, Sr. Adviser, CDD/ ARI, UNICEF New York
35. Ms. Sandra Haji-Ahmed, Chief, Training Section, UNICEF New York

36. Mr. Ashok Nigam, Project Officer, Social Policy and Economic Analysis, UNICEF New York
37. Ms. R. Padmini, Chief, Urban Section, UNICEF New York
38. Ms. Halima Dao, Project Officer, Guinea Worm Eradication Unit, UNICEF New York
39. Mr. John Donohue, Director, Evaluation & Research Office, UNICEF New York
40. Mr. Philip van Haecke, Sr. Evaluation Officer, Evaluation & Research Office, UNICEF New York
41. Dr. Neil Andersson, Sr. Research Advisor, Evaluation & Research Office, UNICEF New York
42. Ms. Krishna Bose, Sr. Project Officer, Evaluation & Research Office, UNICEF New York
43. Ms. Rhea Saab, Programme Officer, Evaluation & Research Office, UNICEF New York
44. Mr. Deepak Bajracharya, Senior Adviser, Environment Section, UNICEF New York
45. Dr. Aaron Lechtig, Regional Nutrition Adviser, UNICEF ESARO Office
46. Mr. Alexander Cairncross, Sr. Project Officer, ITECH, UNICEF Burkina Faso
47. Mr. Colin Glennie, Sr. Project Officer, Health, UNICEF Uganda
48. Mr. Peter Wurzel, Chief, WES, UNICEF Maputo, Mozambique
49. Mr. David Williams, Chief, WES, UNICEF Jakarta, Indonesia
50. Mr. Philip Wan, Chief, WES, UNICEF Dhaka, Bangladesh
51. Dr. Reda Haggag, Chief, WES, UNICEF Cairo, Egypt
52. Mr. Gourisankar Ghosh, Chief, Water and Environmental Sanitation Section, UNICEF New York
53. Mr. Carel de Rooy, Sr. Project Officer, Water & Environmental Sanitation Section, UNICEF New York
54. Ms. Vanessa Tobin, Sr. Project Officer, Water & Environmental Sanitation Section, UNICEF New York
55. Ms. Margaret Karp, Asst. Project Officer, Water & Environmental Sanitation Section, UNICEF New York

Appendix B

Workshop agenda

Planning for health and socio-economic benefits from water and sanitation programmes

21-22 April 1993

Venue: Labouisse Hall
(Maurice Pate, Morning of 21 April 1993 only)

Agenda:

Wednesday, 21 April 1993

SESSION I
Introduction

Chairperson: **M. Ahmed, Associate Director, Programme Division**

9:00 – 9:10	Opening Address	K. Sham Poo, Deputy Executive Director, UNICEF New York
9:10 – 9:20	Introduction	
9:20 – 9:30	UNICEF Support for Water and Sanitation Programmes. What are the Potential Benefits? Situation Analysis and Results of Recent Evaluation Studies.	J. Donohue, Director, Evaluation and Research Office G. Ghosh, Chief, WES, UNICEF New York
9:30 – 9:50	Keynote Speech	S. Esrey, McGill University
9:50 – 10:00	Coffee/Tea Break	

SESSION II
Health Impact

Chairperson: **Nyi Nyi, Special Assistant to the Executive Director**

10:00 – 10:15	Measuring Health Impact: Is This Still Necessary? Evidence and Doubts	R. Cash (HSPH) Harvard School of Public Health & Hygiene
10:15 – 10:30	Impact Assessment Through Community Surveillance Methods	N. Andersson, Sr., Research Adviser, Evaluation and Research Office, UNICEF New York
10:30 – 10:45	Going Beyond Health Impact Measurements	S. Cairncross, Sr. Project Officer, UNICEF Burkina Faso
10:45 – 11:45	Group Discussions: Implications for Conducting Health Impact Studies	
11:45 – 12:30	Plenary	
12:30 – 13:30	Lunch Break	

SESSION III
Hygiene Behaviour

Chairperson: **J. Donohue, Director, Evaluation Office**

13:30 – 13:45	Indicators for Hygiene Behavioural Changes	M. Boot, (IRC), Training Researcher, IRC
13:45 – 14:00	Guinea Worm Eradication: What Role has Water Supply Played in Changing Behaviour?	J. Sherry, Sr. Adviser, Programme Strategy
14:00 – 14:15	UNICEF/WHO Joint Strategy for Hygiene Education	D. Warner, Manager, CWS/WHO M. Simpson-Hebert, Technical Officer, CWS/WHO
14:15 – 15:15	Group Discussions: Planning for Behavioural Changes	
15:15 – 16:15	Plenary	
16:15 – 16:30	Coffee/Tea Break	

SESSION IV
Nutritional Impact: Panel Discussion

Chairperson: **K.E. Knutsson, Regional Director, UNICEF ROSA**

16:30 – 17:00	Time Saved by Women Converted into Nutritional Energy Savings of Public Health & Hygiene	K. Nath, Director, All India Institute
	Nutritional Benefits from Water and Sanitation Programmes	A. Lechtig, Regional Nutrition Adviser, UNICEF Kenya
17:00 – 18:00	Plenary Discussion: How to Maximise Nutritional Benefits from Water and Sanitation Programmes.	

---

22 April 1993

SESSION V

9:00 – 10:30	Stocktaking: Using what We Know to Develop a Conceptual Framework	C. Glennie, Sr. Project Officer, Health, UNICEF Uganda

---

SESSION VI
Cost Effectiveness

Chairperson: **H. van Damme, Director, IRC**

10:30 – 10:45	Perspectives from the World Bank on Better Health in Africa	A. Elmendorf, Principal Management Specialist, Health & Nutrition Division, WB
10:45 – 11:00	How to Improve Cost Effectiveness of Water and Sanitation Programmes.	A. Nigam, Project Officer, Social Policy and Economic Analysis D. Heyward, Consultant, UNICEF New York
11:00 – 11:45	Group Discussions: Strategies for Improving Cost Effectiveness of Water and Sanitation Programmes	
11:45 – 12:30	Plenary	
12:30 – 13:30	Lunch	

SESSION VII

Improved Planning for Health and Socio-Economic Impact

Chairperson: **D. Warner, Manager, CWS/WHO**

13:30 – 13:45	Exploring Institutional Implications for Supporting Health and Socio-Economic Benefits	M. Yacoob, Task Manager, WASH
13:45 – 14:00	How to Improve Sector Planning through the National Plans of Action	C. de Rooy, Sr. Project Officer, WES B. Ledogar, Sr. Planning Officer, Planning & Coordination Office, UNICEF NY
14:00 – 14:45	Group Discussions: Planning for Health and Socio-economic Benefits	
14:45 – 15:30	Plenary	

SESSION VIII

Chairperson: **S. Woodhouse, UNICEF Representative, Vietnam**

15:30 – 16:00	Where Do We Go From Here? Summary of Key Learning Points from the Workshop	S. Haji-Ahmed, Chief, Training Section, UNICEF NY P. Thomas, Consultant
16:00 – 17:00	Plenary Discussion: Recommendations	
17:00 – 17:30	Adoption of Recommendations: Panel Discussion	
17:30 – 17:45	Closing of Workshop	James P. Grant, Executive Director

---

Appendix C

Final summary of workshop discussion

Final summaries of the major points were presented by Sandy Cairncross, Steven Woodhouse and Pamela Thomas. All three remarked on the very high degree of consensus among participants on the future direction for UNICEF and global WES activities.

Health and socio economic impacts and their measurement

1. Provision of integrated water, sanitation and hygiene education have a synergistic impact on a variety of health and socio-economic factors. Water and sanitation facilities make health impact possible but appropriate design, hygiene education and promotion help achieve full benefits.
2. Health benefits are probably under-estimated in that current measurements are inappropriate. It is important to measure severity of disease rather than incidence. Measurement is only useful when based on appropriate indicators. It is usually more useful to use process and outcome indicators.
3. Health impacts are mediated by behaviour change, e.g., using the facilities, hand washing with soap, etc. This requires information, education, and communication and integration of hygiene education within the WES sector.
4. Research should begin at household and community levels. This should: involve the community in research activities; include a number of research methodologies; and share information with communities to enable them to make their own decisions and to find solutions to problems.
5. The impact of water quality is debatable. Water quantity appears to have greater health impact than water quality.

Cost effectiveness

6. There is a need to improve cost effectiveness and accountability to local communities. Measures of cost effectiveness should reflect community perspectives. Low cost, appropriate technology needs to be promoted at government levels along with involvement of the private sector, community financing, and standardisation of equipment and spare parts.

Behaviour change

7. Achievement of health-related goals depend on changing the focus of WES programmes and changing behaviour of decision-makers and planners at all levels as well as behaviour of implementers and users.
8. UNICEF's WES strategy should incorporate behaviour change as an essential focus for health and socio-economic impact.
9. To achieve changes in behaviour that will lead to health benefits, it is necessary to: work with communities; have knowledge of existing behaviours and beliefs; know what is possible; set appropriate objectives; have effective two-way communication systems that encourage community participation and empowerment; provide effective support; provide appropriate WES services; and have linkages with other related sectors and service providers.

Community participation/ empowerment

10. There are inherent difficulties and contradictions in promoting sustainable systems via external government resources and, at the same time, attempting to empower local communities. Ways need to be found to address these problems.

The integrated provision of water, sanitation and hygiene education have a synergistic impact on a variety of health and socio-economic factors.

11. There was widespread support for community participation and community empowerment as basic strategies for WES programmes, with a particular focus on empowering women.

12. Community-based water and sanitation programmes provide an important entry point for other interventions.

Integration

13. Within the WES sector, sanitation, water and hygiene education must be integrated. It was agreed that benefits of water and sanitation were incremental and that hygiene education was necessary to ensure full benefits.

14. More social scientists and more women should be recruited into the WES sector and this should start at the top. An interdisciplinary approach is needed.

Capacity Building

15. Training is needed at all levels to incorporate community approaches and hygiene education. Greater support needs to be given to training women.

16. Training should be given in management and supervision skills, with a particular focus on district levels.

Planning

17. Progress of programme implementation must be reviewed to ensure that people are setting realistic objectives. This is particularly true for national plans of action.

18. Country planning must be inter-sectoral if synergistic effects are to be maximised. Inter-sectoral planning needs to begin in the UNICEF office. Inter-sectoral goals and objectives should be set.

19. If NPA or World Summit goals are to be met, more emphasis must be placed on health impact objectives for water and sanitation and the integration of hygiene education into WES programmes. More inter-sectoral linkages must be put in place.

Advocacy and communication

20. It was agreed that advocacy was important for the WES sector both within and outside UNICEF and that advocacy was also needed for the integration of hygiene education within WES.

21. Hygiene education and communication are necessary and the WES sector should recruit more professionals in this area, initially in high level posts.

22. If WES is to be a ***process*** rather than provision of services, good communication will be required at all stages of planning, implementation, monitoring and evaluation.

23. To gain support for hygiene education it is necessary to start with the planners who must understand that: WES is a process rather than a structure; and that two-way communication is a key element which entails a participatory process. Hygiene education should also be seen as a communication process rather than simply developing posters or "giving information".

Health and Socio-economic Benefits from Water and Environmental Sanitation Programmes

To provide practical guidelines for a global water and sanitation strategy which incorporates health benefit objectives, UNICEF organised a two-day workshop, "Planning for health and socio-economic benefits from water and sanitation programmes", which brought together leaders in the field from major global organisations involved in water, sanitation, hygiene education, epidemiology and development planning. The workshop was organised by the Water and Environmental Sanitation Section and the Evaluation and Research Office, UNICEF, New York, and held in New York, April 21-22, 1993.

Participants included representatives of The World Health Organisation, World Bank, United Nations Development Programme, WASH, USAID, the International Water and Sanitation Centre, McGill University, Harvard School of Public Health, All India Institute of Hygiene and Public Health and University Federal of Pelotas. A number of UNICEF regional representatives, country representatives and section chiefs from New York and field offices also participated.

The objectives of the workshop were to provide inter-agency and inter-sectoral collaboration, to improve knowledge of how health and socio-economic benefits can best be achieved from water, sanitation and hygiene education programmes, and to develop and endorse guidelines for a global strategy which would focus on maximising health and socio-economic impacts.

The workshop was closed by the UNICEF Executive Director, James P. Grant who confirmed that if countries are to reach the goals they have set for children by the year 2000, water, sanitation and hygiene education will provide the basic stepping stones. *"We have come a long way in the last 50 years, but we will not meet the goals by the year 2000 unless we bring basic water supply and sanitation to everyone"*

For additional information or copies of this report, please wr

The Chie
Water and Environmental Sanitation
UNICEF, DH40-P
Three United Nations Plaza
New York, N.Y. 10017
Fax Number: (212) 702-715