Tampereen teknillinen korkeakoulu
Rakennustekniikan osasto
Vesi- ja ympäristötekniikan laitos

Tampere University of Technology
Department of Civil Engineering
Institute of Water and Environmental Engineering

N:o B 40

Hukka, J.

Environmental Sanitation - Beyond the Decade

-Discussion Paper

UDK 628.42
ISBN 951-721-482-0
ISSN 0784-655X

Tampere, Finland 1990

FOREWORD

This is a discussion paper published informally by the Tampere University of Technology, Institute of Water and Environmental Engineering (TUT/IWEE). This paper is based almost exclusively on the literature review, and it will be available only in English.

The focus of environmental sanitation in this context is on-site sanitation in the Third World Countries. Especially the experiences during the International Drinking Water Supply and Sanitation Decade (IDWSSD) 1981-90 are discussed. Because the achievements regarding the sanitation service coverage and the use of the constructed facilities during the Decade have been rather modest, the improvements will be required also in this sector, if the intended goal "health for all by 2000" is to be met.

This paper has been written particularly for the further development regarding the externally supported community sanitation programmes. The final draft of this paper has been distributed to the participants of the Finnish International Development Agency (FINNIDA) seminar on environmental hygiene improvement on the 4th of October 1989 in Espoo, Finland.

Finally, I wish to express my gratitute to the colleagues in TUT and in FINNIDA, whose comments have greatly improved this paper.

Tampere, 12 January 1990

Jarmo Hukka
Researcher

ACKNOWLEDGEMENTS

This paper was initiated with financial support from Finnish International Development Agengy (FINNIDA). The support is gratefully acknowledged.

ENVIRONMENTAL SANITATION - BEYOND THE DECADE?

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

BAT	- Best Available Technology
BMZ	- Federal Ministry for Economic Cooperation, Federal Republic of Germany
CARE	- Cooperative for American Relief Everywhere
CIDA	- Canadian International Development Agency
DAC	- Development Assistance Committee
DANIDA	- Danish International Development Agency
FINNIDA	- Finnish International Development Agency
FRG	- Federal Republic of Germany
GTZ	- German Agency for Technical Cooperation
HIE	- Health Impact Evaluation
HIRDEP	- Hambantota Integrated Rural Development Programme
IDRC	- International Development Research Centre
IDWSSD	- International Drinking Water Supply and Sanitation Decade
IRC	- International Reference Centre
IVS	- International Voluntary Service
MEP	- Minimum Evaluation Procedure
NGO	- Non-governmental Organization
NORAD	- Norwegian Agency for Development Cooperation
NWSDB	- National Water Supply and Drainage Board
OECD	- Organization for Economic Cooperation and Development
SEARO	- WHO Regional Office for South-East Asia
SIDA	- Swedish International Development Authority
UNDP	- United Nations Development Programme
UNICEF	- United Nations Children's Fund
USAID	- United States Agency for International Development
USD	- United States Dollars
VIP	- Ventilated Improved Latrine
VWSS	- Village Water Supply and Sanitation
WASH	- Water and Sanitation for Health Project
WEDC	- Water, Engineering and Development Centre
WHA	- World Health Assembly
WHO	- World Health Organization

1 BACKGROUND

"Once upon a time, a monkey and a fish were caught up in a great flood. The monkey, agile and experienced, had the good fortune to scramble up a tree to safety. As he looked down into the raging waters, he saw the fish struggling against the swift currents. Filled with the desire to help his less fortunate fellow-creature, he reached down and scooped the fish from water".

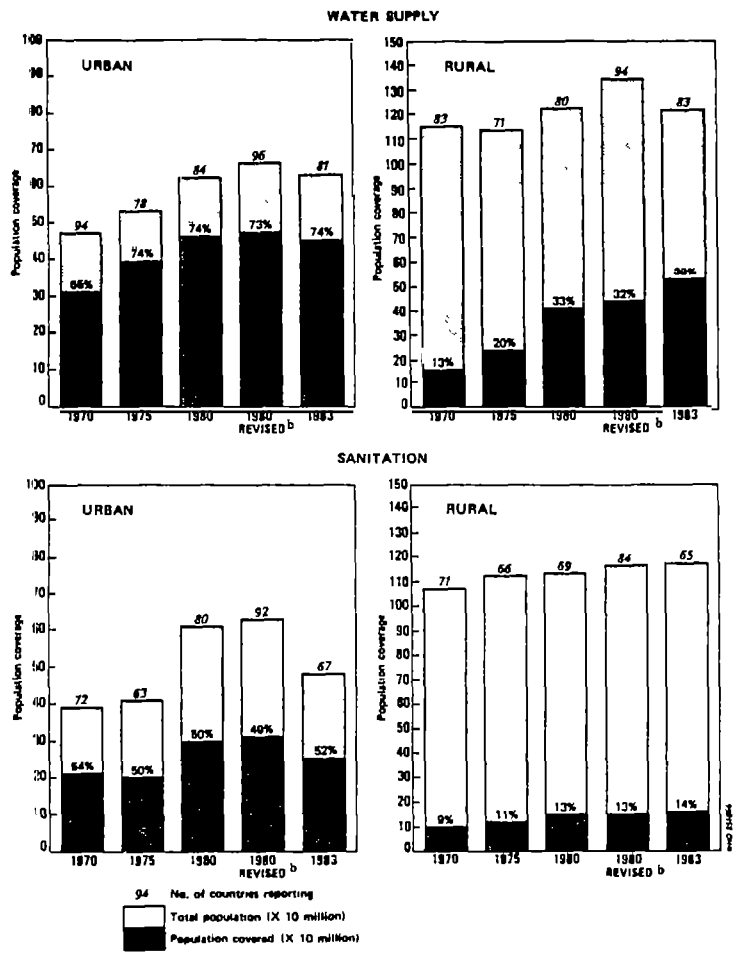

Figure I. Water supply and sanitation. Global coverage in 1970, 1975, 1980 and 1983. (WHO 1986).

Sometimes the achievements in the sanitation sector (Figure I) may resemble the story above, but the whole picture is somewhat different:

According to Lewis (1989) the speed of health improvements in the developing countries is unprecented in human history. For instance, it took between 50 and 70 years to halve infant mortality rates in the West, yet the same improvement took only 25 years in the developing countries. Investments in education, water supply, sanitation and the control of tropical diseases have played a major role in this achievement.

Caldwell (1986, cited by Bryant 1988) has examined the characteristics of the exceptional progress in health development in some countries e.g. in Costa Rica, in Sri Lanka, and in the State of Kerala in India. He states that unusual low mortality can be achieved in the following conditions:

1. There is a reasonable level of female education and sufficient female autonomy.

2. The society is of a kind that generates a continuing political activity.

3. There is ready access to health services.

Nag (1988) also pointed out that although Kerala has lagged behind the other Indian states in industrialization, income, and urbanization, it has the lowest mortality and fertility levels in India.

The message is quite clear: the improved health conditions are not necessarily economic development spin-offs. The better health can be achieved, if appropriate measures are introduced and promoted.

The objective of environmental sanitation should be the overall improvement in the community's physical environment (houses, yards, sanitation facilities) to make the conditions more hygienic.

This could be done by promoting improvement of health and community development (multisectoral approach: health; agriculture; education; water and sanitation; housing; industry) not by providing only physical infrastructure (sectoral approach).

2 BENEFITS OF IMPROVED ENVIRONMENTAL SANITATION

Lewis (1989) stated that critical to improvements in health care is expanded investment in infrastructure; clean water supply and sanitation are the main areas where improvement is needed in the next century.

According to him cures for communicable diseases are essential but inadequate, because they cannot prevent repeated infections. Most of the diseases which prevail in developing countries when water supply and sanitation are deficient are infectious diseases caused by bacteria, protozoa, viruses or worms.

Sanitation is an important intervention in disease control since the water and sanitation related disease causing organisms are present in excreta of infected persons. Proper exreta disposal interrupts the cycle of disease transmission by preventing humans, animals and insects coming into contact with faeces and urine. This will reduce the possibilities of further transmission of disease (Table I).

Table I. Prevention of transmission of water and sanitation related diseases (van Wijk-Sijbesma 1985, adapted from WHO 1983).

Disease	Safe water	Safe excreta disposal	Personal and domestic hygiene	Safe handling of food	Safe waste water disposal and drainage
Diarrhoea	++	++	++	++	–
Worm infestations					
roundworm	+	++	+	++	+
whipworm	+	++	+	++	+
pinworm	+	++	++	+	–
hookworm	+	++	+	–	–
guinea worm	++	–	+	–	–
schistosomiasis	+	++	–	–	+
Skin and eye infections, and louse-borne infections	–	–	++	–	–
Mosquito and fly-borne infections					
malaria	–	–	–	–	+
yellow fever/ dengue	–	–	–	–	+
filariasis	–	++	–	–	++
sleeping sickness	–	–	–	–	–
river blindness	–	–	–	–	–

Adapted from WHO (732)

++ = high
+ = medium
– = low or negligible

> "First, it is important to bear in mind that health benefits are never the sole, and seldom the major, benefit of water supply and sanitation project" (Briscoe et al 1986).

Okun (1987) described:

> "Water supply and sanitation provides many more benefits, however, benefits that are essential to sustaining the lives saved by OTR (oral rehydration therapy) and vital to maintaining and enhancing the lives of adults and children. WS&S prevents the causes of diarrhea; controls many other water- and sanitation-related diseases; improves the delivery of primary health care; improves nutritional status; services health centers and schools; releases women from the heavy and time-consuming burden of carrying water from distant sources; provides water for household gardens and animals; promotes commercial activity, supports other sectors, such as housing and industry; improves community organizations that can serve other purposes; and, most significantly, improves the quality of life in the community."

According to Parker (1985) the major benefits based on his Botswana experiences were: improved health, privacy, convenience, status and prevention of measles in cattle.

Taboos and other cultural constraints associated with the handling of excreta may prevent the use of excreta for economic purposes, but environmental sanitation as an industry can provide economic progress e.g. business opportunities, jobs etc.

Although Edwards (1988) stated that effective institutional development projects are not common, environmental sanitation programmes could also be used in strengthening ministries, regional authorities, private enterprises or communities alike.

The private sector has not been very keen on investing in the sanitation, but certainly taking

into account the huge markets for the improved facilities, it would be worthwhile to investigate the possibilities of investments and actions to make this sector commercial and productive.

Sulabh Shauchalaya Sansthan is e.g. an Indian, though non-profit making organization providing low-cost sanitation facilities on a commercial basis for hundreds of thousands who do not have their own facilities in large and small urban centres (Vijayendra 1979).

3 PROVIDING SERVICES THAT PEOPLE ARE WILLING AND ABLE TO PAY FOR

Sanitation differs from water supply, because sanitation facilities are likely to be in most of the cases more or less private instead of being community managed, i.e. facilities are more in rural areas an individual or family responsibility rather than community responsibility.

People do want improved services, but only if these meet their perceived needs, users are able and willing to pay for the services that they perceive valuable.

Briscoe et al (1988) described:

> "Rural people almost always want improved water supplies, but seldom want to invest in sanitation improvements. A recent survey in Zimbabwe showed that 26% of the women and 20% of men saw improved water supply as their most important develoment need. Although there has been a relatively successful effort to improve excreta disposal facilities in rural areas of the country, less than 1% of women and no men put improved excreta disposal at the top of the list. There is, however, consistent evidence from Asia, Africa, and Latin America that if improved excreta disposal facilities are promoted in conjuction with a water supply program that meets the felt needs of the people, improved latrines will often be built and used".
>
> "People throughout the world have an array of strongly held beliefs about defecation, but where improved facilities are wanted, surveys in India, Malesia, Mexico, Zimbabwe, and other parts of the world show the principal perceived benefits to be privacy, convinience, and status--but not health. It follows that where population densities are relatively low, demand for improved facilities for excreta disposal is rarely a high priority".

According to Kamau (1983) 47% of the interviewed people felt that inadequate toilet facilities was the major problem in Mathare Valley squatter settlement in Nairobi, Kenya, and 90% felt that even if it would have lead to increased cost for housing, they preferred to have water-borne toilet facilities connected to each plot.

People in Lesotho are rather investing in housing, furniture and farming than in a latrine (Dlangamandla 1985). Houses have a priority because they can be rented out to provide some income.

Analysis on Mozambique's Improved Latrine Programme shows that people living near production cooperatives, having relatively high economic status and high educational level were more likely than others buying improved latrines (Muller 1988).

There are evidences that even in the poorer parts of the developig world villagers have shown a considerable ability to pay in cash for the services they wanted. They are also willing to make contributions in labour and cash if there is a clearly felt need for services.

In Ayadaw township, Burma funds were collected from all the households in the selected villages to cover certain costs such as cement transportation (U Tin U et al 1988). These model villages also contributed labour to collect construction materials from the supply depot. The pans and squatting plates were distributed in accordance with the availability of water and the ability of families to pay for them. In 1978 only about 10% of the population had access to proper sanitation, and in 1985 about 90% respectively.

Finnwater (1986) recommended based on the report by Wright (1984) that construction of latrines should entirely be financed by the users in Mtwara Region, Tanzania.

Kalbermatten et al (1987) stated that in Baldia, Karachi the people are paying for 90% of the capital costs and all of operation and maintenance

of pour-flush latrines.

Water supply improvements may be the necessary first step in stimulating demand for better sanitation, and sanitation focused hygiene education programmes in conjunction with rural water supply projects may reinforce this effect.

Willingness to pay for sanitation services is much more problematic, because willingness to pay for such services is generally low, except in high-income groups and densely populated areas. In most cases coverage levels have been too low to achieve significant health gains, and the heavy subsidies (as usual) have gone to the rich, not to the poor.

4 COUNTRY STRATEGY

> "Human excreta disposal problems in developing countries cannot be solved with the strategies presently favoured by governments and aid agencies" (Winblad 1987).

First, the strategy should be based on use of public and private sector to create an environment in which community management can function successfully. Secondly, it should be based on affordable and sustainable technology.

The role of each sectoral agency or ministry in participating in the improvement of health conditions should be developed to fulfill the requirements of intersectoral cooperation.

Also the international agencies should develop policies which cope better with the need of intersectoral cooperation in order to improve health status.

Due to the complexity of the relationship between water supply, excreta disposal and health the strategy for health improvement requires definitely an intersectoral approach.

If the sanitation programmes having emphasis on the technical and engineering components only are not linked with the other sectors, it is likely that the full capacity in environment and health improvement will not be utilized, and the simultaneous effects of complementary intersectoral development programmes will be lost.

However, in intersectoral programmes the coordination should be effective, because there is a danger that the community would be given confusing information from different parties.

To improve sanitation in rural areas, a latrine construction programme could be included in housing programmes like in "Million Houses" project in Sri Lanka (Cotton et al 1987). In this programme the village-level community and individual householders are responsible for the

provision of housing, with the Sri Lanka's National Housing Authority assuming the supportive role. The loans to the householders are provided on condition that a latrine is constructed if the house does not already have one. Part of the loan may be used for the construction of the latrine.

According to Tennakoon (1988) the Department of Health in Sri Lanka offers subsidies and provides squatting plates and water-sealed porches as incentives for latrine construction.

Tillman et al (1988) proposed that improved water supply and sanitation should become together with health education and community participation concept an integral part of irrigation projects.

When the policies are formulated, a special attention should be paid to those groups most in need. In practice the identification and classification of those groups would not be necessarily always that easy. If a special support is to be given, the indicators determining, say income levels or the support required, have to be such that they can be easily and reliably measured.

In Harispattuwa Electorate, Sri Lanka e.g. the percentage of the households receiving foodstamps was 83 in one of the villages, but actually only 5% of the households were entitled to receive them (University of Peradeniya 1983). This indicates clearly that if the foodstamps had been used as a criterion for a special support regarding latrine construction, almost 80% of the households would have enjoyed the support basically allocated only for the poorest part of the population.

If the construction and use of improved latrines are engouraged, and the external assistance are to be provided, the common strategy is to supply good quality materials for construction. They could be made available and then sold to the builders or they could be given to the builders free of charge. Also subsidies have been used to engourage the households to build improved sanitation facilities, but even in that kind of programmes the builders have covered at least part of the

costs.

The national policy in Lesotho is that it is not currently appropriate to provide grants or materials subsidies for building of improved sanitation facilities (Koma 1989). For those having not sufficient cash to pay for the latrine a loan scheme has been set up in conjuction with Lesotho Bank.

In Botswana the sanitation programme promotes the use of VIP latrines through a policy of subsidized self-help construction (Land et al 1989). The household contributes 42% of the cost which is about USD 115.

The Aguaruna and Huambisa Jungle Indian Council had developed what was considered in many ways a model primary health care programme, yet during 11 years it had failed to improve the health conditions because of the lack of emphasis on preventive measures (Bartram et al 1988). New improved strategy integrating water supply, hygiene education and sanitation is now being developed.

The donors and the consultants working for them usually have developed their own ideas on sanitation programmes often based on the experiences elsewhere, where the conditions might have been completely different. The national policies based on the local needs are therefore useful, especially if they have been defined after long experiences.

5 LEGISLATION

An example of the existing legislation relating to public health, water and sanitation can be given from Sri Lanka, where the Pradeshiya Sabhas Act, No.15 of 1987 defines the duties of the Pradeshiya Sabha regarding latrines (85-92) (Government of Sri Lanka 1987b):

> "85. It shall be the duty of the Pradeshiya Sabha-
>
> (a) to take effective measures to secure that adequate and proper latrine accommodation is provided for all houses, buildings and lands within such area;
>
> (b) to provide such public latrine accommodation as it is necessary at all places of public resort within its limits; and
>
> (c) to ensure that all latrine accomodation both public and private within its limits is maintained in proper order and condition".

This kind of laws and regulations should be formulated and introduced bearing in mind that they achieve nothing unless they can be implemented and enforced.

Samura (1989) listed one of the problems inhibiting a sanitation programme in Tombo, Sierra Leone that the Village Development Committee has little or no interference in the enforcement of public health laws because of personnal connections.

This shows clearly that the regulations and laws alone are not enough. There has to be a firm commitment from the users to build the facilities, and use and maintain them properly. The authorities also should carry out their responsibilities properly.

6 CULTURAL ASPECTS

Cultural practices can be either beneficial or harmful to health and resistant to health care and health promotion.

Scotney (1986) described some examples of beliefs and traditions involved in people's behaviour regarding water and human waste; the Masai Manyattas of East Africa, and the isolated Jebel villages of western Sudan believe that the members of a family cannot contaminate their own water supply. Some tribes fear utilization of their waste to injure them by witchcraft, and in some African tribes children are told that their fathers, who spend much time away from household, do not defaecate and are superhuman.

To get people convinced to build excreta disposal facilities, and maintain a good personal hygiene is certainly a difficult task if changes in behaviour are not appropriately promoted in that kind of situations.

In Lesotho, for instance, males and females do not usually use the same cubicle in communal latrines, rental units and in schools.

In some communities in Lesotho diarrhoeal diseases are not seen to be caused by contact with faeces. Illness is linked with the seasons, witchcraft or the weather (Dlangamandla 1985).

A common belief in many societies is that children's and infants' faeces are less harmfull than those of adults. With regard to intestinal worm transmission children's faeces are more important source of infection for others, and should be disposed in a safe way (Cairncross 1988).

Keinänen (1983) described the situation in Sri Lanka:

> "In some families the children do not use toilets at all because they are afraid of the pit. In these cases children urinate and

> defecate in the garden and mother carries the faeces to the toilet or throws it under the trees. Small children's faeces seem not to be considered as dirty things as adults' faeces. So, children are usually allowed to defecate everywhere".

In Kenya an interesting social change caused by the introduction of a digester occured among men (Batchelor 1985):

> "Before the introduction men would not use a latrine but continued to go into the bush. The biogas generated excitement for the whole family. Giving four extra hours of good light in the evening, it increased the family's enjoyment of life. So it became a noble thing to contribute to the digester".

During the interviews in two West Bank Palestinian villages, villagers explained that latrines ha not been part of traditional bedouin life, but two factors had engouraged their acquisition of latrines from 1965-85: the effect of school on the children of the village and the demand for latrines from visiting guests (Smith 1988).

Scotney (1986) also stated that the chief factor of motivating people to construct and use latrines is social pressure.

The Orangi Pilot Project in Karachi, Pakistan started also a women's programme including health education. Because custom requires women to stay inside their homes, the project introduced mobiled teams which have meetings with women activists in the lanes (Mustafa 1985).

In Pemba, Mozambique a survey on latrine ownership showed no significant difference between different religions (Muller 1988).

In cultures, where people are using water for anal cleansing, the latrines with pour flush bowls are preferable, and often used for decades.

7 PROJECT PLANNING AND IMPLEMENTATION

Within a single country there may be as many rural water supply and sanitation policies as there are donors. In the past, so-called "donor coordination" has often failed, but the climate has now improved.

The role of water authorities in water supply and sanitation projects have been usually overestimated and the services of the health authorities have been underestimated.

The donor agencies have been providing support to the water authorities, but not a sufficient support to the health authorities. Hence the role of the health authorities, since generally speaking they are better structured to be promoters at community level than the water authorities, has been weak in the project activities. This had decreased essentially the community involvement in the projects.

If the conventional top-down methods widely used presently are to be rejected, and community involvement concept is to be developed further, project prepaparation will take definitely more time than generally in the past.

This will require accordingly substantial investment of staff time by donor and recipient government alike.

Rough screening tools, which can provide insight into the level of service that is likely to appropriate in a particular type of community, and more precise tools are needed to determine the willingness to pay for different service levels.

Institutional analyses will have to be performed to specify the roles of different public sector, private sector, and community institutions. Technical, human resource, and financial constraints will have to be identified. And realistic targets have to be set, and appropriate resources have to be allocated.

Most success has been achieved through agencies specifically created with organizational and motivational skills in mind.

Aid can be only as effective as the policy, economic, and administrative environment in which it operates. Aid therefore has to be concerned with creating the fundamental conditions for its own effectiveness.

If aid is to make a broad and sustained contribution, it must be concerned not only with the proper selection, design and implementation of individual projects, but also with the support of broader sectoral and national efforts and policies.

Multiplicity of donors and the complexity of their separate procedures have increased recipient's administration heavy burden. The budgetary process of the recipient may also be inadequate to cope with the demands of multiple uncoordinated aid activities for domestic resources to complement the external ones supplied by donors.

According to Edwards et al (1988) the first months of a project's life are critical because they establish the management pattern. Therefore there is a need to have a project start-up workshop. The report lists typical problems in the first phase of the project:

- insufficient host government support
- unclear roles
- unclear expectations for performance
- team strife and low trust
- lack of direction

To transfer technical information at community level in Zimbabwe (Laver 1986), visual aids have been developed both to teach people and promote the programme (Table II). The visual media for communicating about sanitation was assessed and evaluated by health workers, experts and development workers throughout Zimbabwe. Also the Builders Instruction Manual was evaluated based on the experiences in the field, and revised accordingly.

This kind of procedure will be in outmost importance by correcting the deficiences and inconsistencies in communications media.

Table II. Methods and materials used in projects. (Laver 1988).

Title	*Description of media developed*	*Recommended uses for media at project level*	*Evaluation method used* ○ *Presentation*
The People of Zimbabwe are Building Latrines (Poster)	A two-colour poster was designed to promote community participation in latrine-building projects. The caption 'The People of Zimbabwe are Building Latrines' was carefully worded so that the area names of different provinces, districts and villages could be substituted and interchanged to provide stimulation for project support at target level. In contrast to the concept of a picture code the poster was designed to provide the solution (and not the problem) to sanitation — hence the illustration of a recommended version of the Blair latrine	○ Mobilization phase to promote awareness ○ Used also to promote national and community awareness on the need for participation in low-cost projects	The poster was evaluated extensively and found to be enthusiastically welcomed by village-level workers. The wording was subsequently widely adapted by target groups and project implementors throughout the country. It was thus considered appropriate for its purpose of promoting awareness at village level. ○ A2 format. Two-colour poster.
Care for Your Latrine (Information card) (See illustration this page)	The information card 'Care for Your Latrine' was originally presented as part of the builders' instruction manual to serve the need for providing key maintenance information. It was later extracted and used as a separate information sheet, that is as a maintenance reminder card for latrine owners. The no-colour format facilitated easy reproduction using photocopying facilities	○ Maintenance phase as maintenance reminder ○ Used also in training programmes	The information card was evaluated when it originally appeared in the context of the builders' instruction manual. Minor amendments were made to the wording and illustrative content, after which it was considered appropriate for use either as part of the manual or as a separate information sheet. ○ Either as part of *Builders' Instruction Manual* or as a double-sided A4 card. Encapsulated in plastic for longer life
Builders' Instruction Manual (Blair Latrines)	The builders' instruction manual was compiled for village-level workers and home builders who wished to become involved in constructing Blair latrines. Apart from providing a simple illustrated step-by-step account of how to build a latrine, the manual also addressed issues relevant to the planning, mobilization and maintenance phases of a project. The content was based on ○ Information revealed through a base-line study of community-level builders ○ Observations made by the author during every stage of implementation ○ Consultations with engineers and field-workers involved in low-cost sanitation development in rural areas	○ Planning phases to illustrate project objectives ○ Mobilization phases to promote project awareness ○ Implementation phases to provide on-site instructional support ○ Maintenance phases to demonstrate principles of home maintenance ○ Use for on-site building training programmes	The manual was extensively evaluated by technology experts and a range of community development workers, including environmental field-officers and village-level builders. The reliability and validity of the content was tested formally on-site by building groups and informally through workshop and discussion groups. As a result several amendments were made to both the content and illustrative style before the final version was considered appropriate for distribution to the target group. ○ A 32-page A4-size manual, either saddle-stitched, bound or stapled. Black and white illustrations. Where possible plastic covers are used to protect each page
Build Your Latrine (A step-by-step summary card) (See illustration page 7)	The summary card 'Build Your Latrine' was designed as a reminder card for the village-level latrine builders. Featuring a double-sided A4-size format it provided through a series of illustrations, key words and measurements of each recommended step for building a latrine. This uncoloured format was specifically selected to facilitate easy reproduction, using photo-copying facilities if necessary	○ Planning phase to promote awareness ○ Mobilization phase to promote action ○ Implementation phase as a reminder card ○ Use also for training programmes	The summary card was extensively evaluated by technology experts and a range of community development workers. After a series of amendments, it was found to be appropriate for use at project level. ○ Double-sided A4 format ○ Encapsulated in hard plastic for longevity

In Sri Lanka the Integrated Rural Development Programme has followed a "package" approach in its tea estate programme. The components of the package are water supply, latrines, housing

improvement/upgrading along with provision of crèches, maternity wards and dispensaries. The setting up of volunteer groups and regular health education programme was also an integral part of the programme (Eckstein 1985).

Even the good health education programme can not guarantee the success of a sanitation programme, if it does not take properly into account the available resources. The goals of the education should be realistic and promote the best use of the often limited resources.

> "Those with the greatest health needs are the poor--the least literate and the least likely to understand the connection between poor sanitation and illness or to have any extra resources, either time or money, to devote to health. Nor in most instances do the poor have ready access to health services" (Yacoob et al 1988).

For the very poor, additional considerations in communication and in finance must be taken into account. Ideally, if a country or community wants to provide some sort of subsidy to poorer residents, it is better (for many reasons, but especially for efficiency) to do so through a form of general support rather than trough special provisions in a particular sector.

7.1 Baseline Studies

According to Narayan-Parker (1988) baseline studies can be invaluable in discovering cultural, social, psychological, physical and organizational factors of relevance to water supply and sanitation. However, from the planners point of view academic baseline studies have often been of limited value, especially when the time-lag between the start of the study and the results presentation has been long.

It would be useful, although sometimes expensive, to study, how much contamination takes place between when water was collected and when it was consumed, and hygiene and sanitary habits in the

community. If the study is not carefully planned and executed, the results are difficult to interpret and pointless.

This kind of studies could give valuable information in both local and global scale.

The baseline household survey in Belize (Campell 1988) had three purposes. First, to document water supply and sanitation conditions in each village household. Second, to increase the familiarity of village residents with the goals, objectives and procedures of the project, and third, to introduce project staff to residents.

The state of the primary health care infrastructure should be well documented before the start up of the sanitation programmes.

7.2 Finance

The Asian Development Bank (1986) estimates that in the 1970-1984 period about 70% of all investments in the water supply and sanitation sector were allocated to urban water supply, 20-25% to urban sanitation, and only 5-10% to rural water supply. Rural sanitation was largely neglected.

The economic reforms have been necessary responses to changing economic conditions and will have important long-term benefits. Yet in the near term they imply added stringency, further limiting the public funds available for water supply and sanitation.

Significant country-by-country differences also exist. In Latin America and the Caribbean not a single country invested more than 0.5% of its economy in water supply and sanitation even in boom years (Munoz, cited by Wiseman 1988)

The Government of Sri Lanka has allocated for the water supply and sanitation sector 4.6% of all capital expenditure in the years 1980-87 (Government of Sri Lanka 1987a). The actual performance of the sector in the light of using

the allocated capital resources has not been satisfactory, because the actual expenditure has been only 3.0%.

7.3 Timeframe

Although desperate needs exist now, the focus should be on meeting the long-term needs.

If the goal is to provide sustainability and replicability, this would definitely require a longer time than usually adopted in the execution of the water supply and sanitation programmes. According to Yohalem et al (1987) experiences have shown that generally five to seven years is required to get community involved in project, and to transfer technologies and techniques to community leaders and official counterparts.

7.4 Community Involvement

> "Community participation, the organized involvement of a community in a development effort, is expected to reduce increasingly project costs, increase service coverage and encourage technical and administrative flexibility. It is also anticipated that it will help improve operation and maintenance , stimulate broader socio-economic development and enchange community capacities for problem solving" (IRC 1988).

However, it is important to realize that some community members are more interested than others in improving water supplies and sanitation.

Briscoe et al (1988) stated:

> "There are two important dangers. First, it is easy to romanticize "the community", expecting villagers in developing countries to demonstrate a cohesion, capacity, and will that do not exist elsewhere in either developing or developed countries. Secondly, it is wrong to trivialize the notion of community participation using this as an

euphemism for low-cost labour."

The approach to community involvement has perhaps not been realistic enough, because often it has not been seen that community management will require definitely adequate support from the government.

> "It is local people themselves, not those trying to help them, who have the most important role. The community itself must be the primary decision maker, the primary investor, the primary maintainer, the primary organizer, and the primary overseer" (Briscoe et al 1988).

Governments and external agencies must establish the environment in which communities can construct, operate and manage improved facilities.

In the Orangi Pilot Project in Karachi, Pakistan, the experiment has been; first to persuade the residents that if they do not organize themselves to improve their living conditions, nobody will do it for them, and they will face greater hardship; second, to try to reduce the cost of a standard sewerage system and third to provide the interested residents with a low-cost technology and the technical guidance and assistance for constructing it, and to train them in its maintenance and upkeep (Mustafa 1985).

This self-help programme started in September 1981, and by December 1984 1273 of a total of 3072 lanes had constructed sewerage lines, and of 43424 houses 20470 had built sanitary latrines connected to the underground sewerage lines in the lanes.

Drucker (1985) did a review of 80 countries where water projects were managed by an international agency which was a leader in its strong commitment to the social elements of development. Its Board of Directors has made it mandatory that community participation must be an integral part of any project.

According to his interpretation only 11 of the 80 indicated that the community played some part in

planning.

Eng et al (1987) stated that it was essential to include participation among the objectives of the project; it must be the intended goal of project planners.

Because of women's central role in household hygiene, food preparation, and childcare, hygiene education programmes are of necessity for women, and, because woman-to-woman communication in such matters is more effective than man-to-woman communication,the programmes should usually be conducted by women.

The Technology Forum for Appropriate Development of the University of Zimbabwe supported introductory courses for women resulting in the construction of over 17000 VIP latrines. Often the women organized brick-making to finanze the acquisition of other latrine componenets (Katare cited by van Wijk-Sijbesma 1985).

7.5 Private Sector

Some key services are best performed neither by the government nor by the community, but the private sector. A properly equipped and suitably rewarded private sector can be an effective bridge between the government's limited capability to service dispersed communities and the community's shortage of skills, tools, and materials.

In the past central government agencies took a large role for themselves, frequently ignoring the potential of private sector institutions and local initiatives. International aid agencies initially welcomed a centralized approach, as this appeared to be the best way to reach the largest number of people with improved services.

Non-governmental organizations (NGOs) can often play a valuable role in identifying improvements that community members want and have the capacity to build and maintain and working with communities to construct, operate, and maintain the facilities.

Briscoe et al (1988) recommended:

> "Public sector: promoter, educator, regulator, and in some cases, financier or financial intermediary. Community: owner, builder, manager and operator. Private sector: provider of special skills, materials, and services to the community".

7.6 Choice of Technology

> "It is ironic but true that inoperative water supplies are found in areas where bicycles, radios, irrigation pumps, ceiling fans, and small industrial machines are reliably maintained. It is apparent that what is at fault is not the complexity of the technology, but the top-down approaches being followed in the design of systems and the maintenance of facilities" (Briscoe et al 1988).

BMZ Sector Paper (1984) stated that consumers may have to accept lower, economically feasible supply standards and simpler technologies. This is justified because in many cases higher service standards do not only improve health conditions but mainly enhance users convenience.

The availability of water even during the dry season must be guaranteed before introducing pour flush latrines. If there is scarcity of water during the dry season a direct pit latrine with a removable pour flush bowl can be constructed. When this type of latrine is provided with a ventilation pipe, it can be used as a VIP latrine during the dry season (Cotton et al 1987).

Ground conditions will have an effect of the technical solutions for the latrine construction. If the ground is rocky, bed rock is near the surface or if the groundwater table is high, deep pits are not feasible. The superstructure and pit can be raised in such situations or even the douple pit pour flush latrine might be considered feasible because of the pits are rather shallow.

Also an introduction of the Vietnamese type of latrine could be considered.

The location of the latrine is quite important. Although in many soils the movement of pollution is quite small - perhaps as little as a metre or two - it will be sensible to dig pits as far as possible from drinking water wells (Pickford 1988).

If in sparsely populated areas people are covering their excreta with soil, they should be educated to bury it at least to a depth of half a metre, which is enough to control larvae of flies and worms (Nordberg et al 1989).

Small children may find this "cat method" safer to use than a conventional latrine.

The simple pit a metre square and a metre and half deep would last for two to four years for a family of six people (Pickford 1988). If there is plenty of space around the house this kind of practice would be sufficient sanitation measure.

Ministry of Health inspectors in Zimbabwe village-level sanitation programmes have rejected lower-cost structures made with poles, grass and mud because of their low life span (Morgan 1988). The families are receiving a subsidy in the form of materials.

The DANIDA supported rural water supply and sanitation project in Sri Lanka has also given subsidies on condition that the latrines are made of acceptable materials and are of permanent type (Kampsax-Krüger 1989).

This kind of practice could be adopted if materials of proper quality are made locally available.

Winblad et al (1988) described that most of the SIDA-funded Blair latrines had no fly-screen because the recommended stainless steel screen was not available in Zimbabwe. The recommondation of the report was either to change the technologies or to start production of this key item within the

country.

Experience in Lesotho has shown that communal latrines are not appropriate and that it is better to lend money for the construction of latrines than give it away (Blackett 1988).

In rural areas fly-screens, vent pipes and reinforcing bars are sold through the network of clinics, while district prisons are making and selling concrete slabs.

In Mozambique mainly the lack of building material forced to give up the idea of a roofed superstructure and a ventpipe (Brandberg 1985). The smell problem and fly control was solved by using a light tight-fitting lid of high quality concrete, cast in the hole of the non-reinforced latrine slab. The additional advantage was also noticed; it stopped cockroaches, the permanent residents of pit latrines.

According to Muller (1988) traditional latrines were very short-lived being replaced after less than two years of construction in Zimbabwe. This was mainly because they had filled up or poor soil conditions had led to pit failure.

Efraimsson (1987) did not recommend the traditional pit latrines due to various problems encountered with them:

> "Whenever water is used in toilets for bathing, anal cleaning etc. a pour flush toilet can be feasible. If constructed with alternately used pits it can be considered the best available technology for on-site sanitation".

Nordberg et al (1989) pointed out that VIP latrine had been advocated too widely and too uncritically:

> "Problems of high costs are solved by SIDA-funded subsidies to private households. Problems of non-availability of transport and materials are solved by SIDA-funded import of vehicles, fuel, reinforcement and flyscreens.

> The programmes are therefore not sustainable by local resources".

In the future the demand for food will be immense, and accordingly the possibility of using composted human excreta as fertilizer should be encouraged whenever possible and recommendable. Also the demand for household fuel and energy will increase with population growth. Accordingly if long-term perspective is favoured, technology selected should be promoting composting and biogas production.

Nordberg et al (1989) described that experiences from the UNICEF-funded Wanging'ombe Project in Iringa Region, Tanzania, showed that the users accept to remove the compost, and the demand for fertilizer is now so great that even the old pit latrines have been dug up.

Various types of latrines were tested in Bangladesh (Gibbs 1984): water-seal, improved pit with a chute, ventilated improved pit, vietnamese type, and IVS (International Voluntary Services) type made entirely from locally available materials (bamboo). In September 1982, the technology was evaluated. The main finding was that if there was high adult female usage of latrines, there was low child usage; and vice versa.

This finding indicates that if the superstructure offered privacy, the children were afraid to use such kind of a latrine, and the substructure technology became almost irrelevant in this regard.

The recommondation was to direct the attention towards the users' needs rather than attempt to use the perfect engineering solution, if the use of the latrines is to assured. To guarantee women's privacy, and to make children feel safe, it was recommended to place the latrines inside houses.

The second finding was that the IVS type of latrines were not functional, because bamboo tended to degrade quickly. This shows clearly that

some local materials can be inappropriate, and should not be used.

Keinänen (1983) described in the study of Harispattuwa, Sri Lanka:

> "Even if the latrines are not very far from the house they can be in very difficult places. People have to climb up and down the hill. That is why urinating and defecating during the night usually takes place in the garden. That is also why children often do not use latrines".

To guarantee the vital usage of latrines, especially by children and older members of the family, it would be advisable to investigate the possibilities to introduce the type of latrine, which could be connected to the house. This would offer increased convenience also to the other users.

A limiting factor in the selection of technology is also lack of space in squatter settlements and in some densely populated rural areas e.g. in some parts of Kandy District in Sri Lanka. In many instances emptying of VIP type or pour flush single pit latrine is not viable and practicable.

7.7 Production and Construction of Sanitation Facilities

In Zimbabwe the latrine slabs were made by twelve community latrine construction co-operatives as a result of a self-help pilot project (Paqui 1988). Slabs which sell for USD10 each carry a life-time guarantee, and more than 25000 slabs have been sold and installed.

In Sechura, Peru the introduction of improved sanitation was done by building first public latrines and then credit were made available for self-help groups to construct domestic models afterwards (Maber 1989). Local craftsmen were involved at all stages of production, and this ensured the acceptance and replicability of technology within the community.

In Botswana the household is responsible for pit excavation and construction of superstructure (Land et al 1989). The District Council is in charge of substructure construction. In some cases it also offers a free door as an incentive for rapid completition.

In Sri Lanka the common procedure in externally supported programmes is that the household is responsible for construction of the latrine, and the programmes will provide subsidies covering about 25-75% of the material costs depending on the donor agency. The programmes normally provides also latrine slabs and squatting pans with siphons to the households.

According to U Tin U et al (1988) the local masons in Ayadaw, Burma were trained in production of ferro-cement squatting plates in the township hospital compound. The construction of latrines by the households was supervised by the village working committee.

Efraimsson (1987) recommended that in Western Province in Kenya a possibility of setting up a larger central production unit capable of producing pre-stressed concrete latrine slabs should be investigated.

This kind of a unit is feasible, if good quality products, which could be re-used, can be produced and when the production and transportation costs can be kept lower than the costs of on-site production or the costs involved in small unit production. The large unit can also create permanent jobs, what should also be considered an advantage.

Although user participation is recommended and a necessity, the sustainability regarding products and to some extend the introduction of new ideas regarding technology advancements, and involvement of private enterprises in production and transportation should be promoted.

7.8 Usage and Maintenance of Sanitation Facilities

The provision of sanitation facilities, perhaps the easiest part of the community water supply and sanitation projects, does not ensure the achievement of health benefits. The community should also be motivated to use and maintain the facilities properly.

The required motivation and education should be carried out by agencies involved in community development and community resources mobilization rather than by agencies normally responsible only for the development and provision of physical facilities.

A special attention should be paid to older people and children, because it is important that the whole community will take use of the improved sanitation. Parents should also be educated that children's excreta should be disposed properly in the latrine.

The need of keeping the latrines (slabs, door handles etc. depending on the type of latrine) hygienically clean should be communicated clearly.

The maintenance and repair practices should be addressed efficiently within the users, because poorly maintained facilities quite easily will discourage people from constructing and using latrines. Also such facilities mean perhaps even greater inconvenience to the users than their earlier defaecation practices.

Kamau (1983) stated that in Kenya in squatter settlements houses were owned by absentee landlords who did not take care of the latrine maintenance. Since tenants were not socially organized to take any action, nobody was effectively responsible for maintenance, and overfilled pits and collapsing superstructures were a common sight.

Muller (1988) described that in Zimbabwe improved latrines were kept clean and covered better than traditional ones, mainly because of the purpose-made covers. Children did not start using the

improved latrines younger than they did the traditional ones. Latrines were used by children at younger age in the households of high educational level than elsewhere. The economic level of the households had only a weak correlation with the age at which children started using latrines.

7.9 Environmental Impact

> "The risk of contamination of water sources is particularly great in areas with a high population density, such as urban and urban fringe areas, large planned settlements, markets, centres, etc. In such areas, the choice of sanitation technologies is particularly critical; low-cost technologies such as pit latrines may actually increase the risk of contamination of water sources in some cases, such as urban fringe areas located near water courses" (DANIDA 1988).

According to Efraimsson (1987) the number of households without latrines is presenting a serious threat to the entire population in Western Province in Kenya. Traditional water sources in the area are heavily contaminated, and the present water supply project in the area is also developing groundwater resources.

If fired bricks are to be used for construction of latrines, the effects of wood consumption on deforestation in this regard should be evaluated, and considerations should be given to safeguard the environment.

7.10 Review and Evaluation

> "Thorough assessment of overall objectives, target groups and external factors that determine success or failure is often lacking" (Introduction to Logical Project Analysis, NORAD 1988 in NORAD 1989).

According to McGarry (1986) the Logical Framework Analysis, is currently used as a standardized

project planning format by several international agencies such as UNDP, CIDA, USAID, and GTZ. In this method evaluation is incorporated within the framework covering all levels: efficiency, effectiveness, and impact.

In addition to external review and evaluation, also in-house project review workshops should be conducted.

The outcomes of such review workshop could be according to Frelick et al (1988):

- a better understanding of the objectives, status, and planning of the project
- participants come to know and appreciate one another better
- written agreements can be done on how cooperation can be improved
- written statements can be formulated and agreed on key project needs, management structure, procedures of monitoring, communication, frequency of meetings, reporting relationships, and horizontal coordination
- time schedule for major project activities can be prepared and agreed

Edwards (1988c) described the goals of a project mid-term evaluation workshop:

- define the management functions
- exchange ideas about the management structures
- improve conflict-management skills
- evaluate project strategy and modify it as needed
- review and revise as needed the agreements between counterpart institutions
- strengthen interinstitutional relations and improve coordination
- define the roles
- incorporate the results of the workshop into draft regional and project plans

Briscoe et al (1986) stated:

> "Because economic and social justifications for water supply and sanitation programs are more likely to be dominant in urban than in

> rural settings, it is usually in rural settings that information on the health impact of water supply and sanitation interventions becomes critical to investment decisions, and thus it is often in rural settings that health impact evaluations will be most "useful" to planners deciding on the level of resources to be devoted to the water supply and sanitation sector".

Even well-designed scientific studies have found it difficult to isolate direct effects of water and sanitation improvements on community health.

The results of health impact evaluation (HIE) should be readily available, i.e. a HIE should last 9-12 months in order to give required and useful information to the planners of water supply and sanitation programs (Briscoe et al 1986).

The benefits of the information generated by an evaluation of a project are dependent on the size of the next project to be undertaken, and bear no particular relationship to the cost of the project that is to be evaluated. Especially, if the information is to be used to replication of a project on a large scale, the benefits on the health impact will be large.

Additional social and economic benefits from the projects should also be evaluated, and attention should be paid to possibilities for intersectoral cooperation to get community more involved in its own development and to get people motivated to utilize fully the services constructed.

Minimum evaluation procedures (MEP) by WHO (1983) recommended that the following should be evaluated:

- functioning of the facilities
- utilization of facilities
- health impact
- proportion of households having improved latrines
- sanitation hygiene
- sanitation reliability
- cultural acceptability

- health education

In evaluation a special attention should be paid to the defaecation practices of children. If children are not using the latrines constructed and continue to defaecate around as earlier it is likely that health status will not improve.

National support system and other community development programmes should be also evaluated.

Smith (1989) proposed that monotoring the rates of latrine acquisition over a period of many years would provide a better understanding than a single point measurement.

7.11 Education and Motivation

> "If people in the developing world are to have radically improved lives, it is first of all necessary to teach them to be dissatisfied with the present situation and at the same time make them appreciate how they can work towards a better future" (Bidwell 1988).

The introduction of latrines in Finland in the 19th century is described by Vuorela (1975, cited by Katko 1989):

> "The words used for referring to the latrine were mostly of foreign origin (huusi, hyysi, makki, pikkukamari, priveetti). This would indicate that the latrine was first introduced in the upper classes. Still in the 1880's information about latrines was spread by soldiers who had been drafted for the reserve. In the 1890's most houses in central Ostrobothnia were equipped with a latrine. It was, however, seldom used, because "who would care to use one" (Relander 1892)".

In societies where most people do not proceed beyond the primary stage, primary school takes on greater role in health promotion. The primary school health education syllabus should therefore properly designed and implemented.

The following ways could be used in most effective combinations for hygiene education: school, adult education programmes, sectoral programmes of training and extension services, non-governmental organizations, religious institutions, maternity wards, mass media, and person-to-person communication.

Behaviour changes can occur only when health education is follow by the changes in the physical environment. It is no doubt very difficult to get people not to use contaminated water sources, if there is no alternative.

School health action plan should be developed including: upgrading school sanitation facilities and sanitary conditions, teaching basic sanitation, expanding and improved health education programmes, immunization, medical examinations, inspections of sanitary conditions of schools and school yards.

Using latrine-cleaning as punishment should be discouraged as it tends to lower the status of latrines (Dlangamandla 1988).

In higher education the curricula development regarding the environmental hygiene should follow the knowledge level required in the corresponding branch of science.

Winblad (1987) suggested that health and latrines should be treated as separate issues:

> "Better health is achieved by a faecal free environment. Households build latrines for other reasons than health (privacy, convenience etc.)."

The different objections to latrine construction in the community, like an unwillingness to share the latrine, fear of contact of excreta, flies, cost or time involved in construction etc. have to be treated differently, and the education and motivation campaigns should be formulated accordingly.

If the community has some kind of excreta disposal

systems, like bucket latrines, the education and motivation could be directed to the construction and usage of improved facilities, like pour flush toilets etc.

The community sub-groups (tenants, owners etc.) will require often different kind of approaches in the education and motivation programme.

The level of communication and advice regarding the construction of the facilities will depend on the selected technology. The detailed information and technical advice is required by the builders, if they are to construct the improved latrines by themselves.

If the selection could be done between various latrine types people should be made aware of the advantages and disadvantages of different designs in order to allow them to most suitable one for their specific needs.

Hygiene education packages covering all the basic facts about environmental and personal hygiene should be formulated to meet the community's needs to take the full advantage of the improved facilities.

Narayan-Parker (1988) showed quite clearly that unless women and children become convinced of the need to change the way they handle drinking water at home it will continue to be polluted, despite improvements at source.

Simpson-Hebert et al (1987) described a good hygiene education programme active rather than passive. The report also emphasized that most personal hygiene is learned in the first five years of life especially the habits regarding urination and defaecation.

Torres et al (1988) recommended that target groups for a social marketing programme would be; mothers of toddlers (aged 1-3) and preschool children (aged 4-6); primary school children and members of indigenous communes, sporting clubs and farmer groups.

If a new technology is introduced, definitely a suitable community education programme should support that action.

According to Yacoob et al (1988) social marketing offers a valuable approach solving problems in water supply and sanitation that are related to behaviour rather than technology.

Koma (1989) points out that the VIP latrine is marketed in Lesotho as affordable but not just for poor people as this would reduce its status value.

In Karachi, Pakistan a social worker spent several months in a squatter settlement before the community lost its skepticism and participated in a sanitation programme (Quratul Ain 1984, cited by McGarry 1986). The local cricket club was the first group to want the streets cleaned so that it could play cricket without getting balls constantly soiled.

Hasan (1988) points out that there is no longer a need to motivate the people in Orangi township, Karachi. Lanes are organizing themselves and contact the project for technical assistance. The project relying on community involvement has caused a major and social change. The lanes are cleaner and healthier, and the people have improved their houses and the value of their property has gone up considerably.

In Mozambique it was discovered that people most commonly learned of the improved latrine from existing users (Muller 1988). Also a high number of people were informed on improved latrines by the local political authority.

Some key elements of the the effective communication and health education are summarized in Table III.

Table III. Communications support guide: which media to use (Laver 1986).

Project phase	Key issues	Method of communication support
Planning phase	Establish contact with key leaders	Face to face contact with key leaders
Community needs survey	Community needs survey eg assess problems, needs and priorities	Small group discussions
	Discuss technology options/project benefits	Visits to other projects
	Explain about support organizations and structures	Psycho-social methods for problem solving eg picture codes
Mobilization phase	Facilitate decision-making through groups	Group/public meetings/promotional media
	Discuss community objectives/contributions	*Poster 'The People of Zimbabwe are Building Latrines – Join Them!'
	Facilitate community organization through local management structures	*Leaflets ie. summary leaflets 'Build a Latrine'
	Choose project site with the people/leaders and community-based workers	Visits to other successful projects
Implementation phase	Provide information support	
	Facilitate delivery support materials ie cement etc.	*Instructional support ie. Builders Instructional Manual
	Encourage maximum community support for project	*Information leaflets ie. summary leaflets 'Build a Latrine'
	Encourage completion of project	On site assistance where necessary
	Facilitate visits by key leaders/local authorities	
Maintenance phase	Encourage placement of high value on facility	Maintenance training eg personal approach
	Facilitate selection/training of maintenance personnel through local management structures	*Maintenance reminders ie encapsulated leaflets 'Care for your Latrine'
	Establish support/referral system for maintenance through local management structures	*Ceramic tiles for plastering into completed structures
		Other hygiene interventions (handwashing etc.)

*Asterisk indicate promotional and instructional support media developed for Zimbabwe project

7.12 Training

> "To review the training of economic planners, acricultural extension workers, water engineers, teachers, environmental specialists, and other professional groups who are to work in health-related fields, in order to secure an adequate understanding of intersectoral relationships with health within their sphere of competence" (Resolution WHA39.22 adopted by the Thirty-ninth World Health Assembly, May 1986).

The Water and Sanitation for Health Project (WASH) has trained nontechnical health, social, and other workers already working at community levels in latrine construction, solid waste disposal and sullage disposal (Iseley et al 1984). These workers would work with communities to promote low-cost technologies.

7.13 Research

> "To encourage and support action-oriented multidisciplinary research focusing socioeconomic and environmental determinants of health in order to identify cost-effective intersectoral actions for improving the health status of disadvantaged groups" (Resolution WHA39.22.).

Research, and especially applied research has had unfortunately considerably low status when the aid funds have been allocated in the past. If the focus stays on the sustainable and replicable development in environmental sanitation, to know the numbers of constructed facilities is not certainly enough.

How can desirable behaviour changes be obtained, if the socio-cultural environment is not known? Are they obtained after the programme completion? Is the issue of introducing VIP latrine correct? Are the administrative procedures, monitoring and evaluation actually helping to reach the targets? Are the allocated funds enough to obtain the targets?

8. CONCLUSIONS AND RECOMMENDATIONS

> "The goals set for the International Drinking Water Supply and Sanitation Decade (IDWSSD) will not be achieved" (Refice Statement 1988).

Education

Water- and sanitation related diseases can be easily prevented by introducing and practicing simple measures. The transmission of diseases, and the importance of personal hygiene such as hand-washing should be understood. Improved sanitation and water supplies are also necessary as well as avoiding contaminated water and food.

The behavioural patterns are obtained during the childhood, and therefore primary schools should provide children and through them the families with the required awareness and knowledge about the good hygiene practices.

The user education should give a clear picture to the users why latrines are neede, how the latrines are to be built properly, and how the latrines are maintained.

Since people are in most cases aware of the diseases caused by unhygienic conditions, the required behavioural changes can be obtained by making the hardware component available.

User education is also required if the technology favouring reuse and recycling of human waste is to be introduced. This is absolutely of major importance considering population growth, food production, energy requirements, and environmental pollution.

Community Involvement

The community involvement should not be regarded just as a meaningless philosophy but as a key factor, if the log-term objectives are to be met.

The people should be encouraged to act for themselves for improvement and change. The strengthening of local self-help initiatives in countryside and urban slum areas should be the common interest of all the parties concerned; government agencies, non-governmental organizations, donors, and people themselves.

Unplanned and uncontrolled infrastructure development should be avoided, and environmental management through community participation should be practised.

Health committees should be established in the community itself to provide the continuity of the externally supported programmes.

The effectiveness of the programmes can be improved through well-chosen communication strategy.

The community involvement should be innovative, and it should rely on the community's preferences. The GTZ supported rural water supply and sanitation project in Sri Lanka approached the villagers, and requested them to identify the village-level organization through which the sanitation programme was to be channelled. The villagers in that district usually chose the Funeral Society as a coordinator for the sanitation activities.

The sanitation programmes should be, of course, performance-oriented, but appropriate time should be allowed to get to know the people to be entered into partnership, their needs and preferences, problems and ideas. Too often the baseline studies and socioeconomic household surveys are offered as a "textbook" solution, and in practice the real familiarization has been neglected because of the pressure of the rapid achievements in numbers of sanitation facilities constructed.

Institutional Aspects

Because the necessity of community involvement and user education has been largely accepted and

included in the strategy, the focus should be perhaps now more on the legal, administrative and managerial frameworks of the environmental sanitation programmes.

When the externally supported rural and squatter area sanitation and, why not also water supply, programmes are discussed, the better host institutions would be those with experience working with local communities. If water supply, sanitation and hygiene education are integrated, as they often are, the ministries dealing with water supplies must be naturally involved, but merely only when administrative matters are concerned or technical assistance and expertise is needed.

Every effort should be done that the programmes could be carried out in existing administrative, economic and technical infrastructure of host countries. The roles of external supporters should be limited merely to those of financiers and representatives of financiers/consultants with the required professional skills.

The project documents when prepared should be more specific with clear objectives and indicators, stating what is done, how and by whom, when and at what cost.

Human Resources

Unfortunately often there are very few community promotion professionals, social scientists, epidemiologists and public health experts in rural water supply and sanitation projects compared to the number of managerial and technical experts. This is not to say that there are too many technical experts in the projects but too few other experts participating in preparation and implementation of the programmes. The projects should be always adequately staffed taking properly into account the available human resources in the host country. Sometimes there seems to be a tendency that the externally supported programmes are drawing the scarce human resources from the host institutions where the

salaries generally cannot compete with those in private sector.

Sortage of trained and qualified personnel at all levels is one of the major constraints when the developing countries are trying to progress in national sector. The lack of adequately trained and motivated manpower as one of the major obstacles has been identified by many agencies having activities in water supply and sanitation sector.

The human resources aspect should be carefully considered and studied before plans for the programmes are developed. Although nationalization, possible and viable, should be one of the objectives in externally supported programmes, in many countries, when e.g. manning ratios and staffing patterns in the sectors involved are studied they generally do not yet support this concept.

The externally supported programmes, although having sometimes high priorities, cannot all have the top priority and are not always of such importance from the host countries' point of view that local experts cannot be replaced with expatriates, when the development of the sector will request that.

However, the seconding expatriates as project managers should be avoided whenever possible. The human resources and capacities of private sector should also be considered adequately when programmes are planned and implemented.

Evaluation

The evaluations should be done either on in-house basis or by teams consisting only the experts not involved in any of the project activities but in reviews and evaluations. The first evaluation should merely improve the management functions, operative planning and execution, and cooperation within the project.

The second evaluation method should focus more on

policy, strategy, objectives, administrative structures, and sustainability of the programmes in order to get fresh ideas regarding these issues. It may be advisable to use some of the experts throughout the entire project so that they would be better aware of the progress.

The sanitation development programmes should be considered dynamic, because the preferences in policies and even in latrine designs seem to be changing constantly. The programmes should offer certain amount of flexibility in this regard, and therefore monitoring and research projects with own budgets are in outmost importance.

When the effectiveness and performance of the programmes have been evaluated or reviewed, often the performance of the donor organizations, sponsoring agents, and government ministries have been discussed little if anything at all. Usually those responsible just for the daily routine activities in the environment made by the other parties involved have been given all the beating. One could easily think that the meaning of the word "cooperation" is sometimes interpreted incorrectly.

If the effectiveness of the sanitation programmes is to be measured, specific goals should be formulated. Those goals should be clear, simple, acceptable to all, and easy to measure.

An efficient reporting and monitoring system should be developed to provide meaningful information on the programme. Specialists could be used to set up the reporting and monitoring system. Far too often it happens that projects are producing reports after reports, monthly, quarterly, biannually, annually, review, evaluation, you name it, offering actually very little regarding meeting of the objectives, and useless statistics. Quantity of the reporting should not go ahead the quality. Objectives hardly ever include writing and reading the reports.

To improve the performance of the programmes in-house project start-up and review workshops should be held. The outcomes of such workshops, if

planned and implemented properly and attended by decision-makers from all parties concerned, would benefit the execution of the programmes.

Also an in-house mid-term evaluation workshop should be conducted in addition to the external evaluation, if the size and time frame of the programme are requiring that.

Best Available Technology

Although the selected technology should always be "low-cost", perhaps "the Best Available Technology (BAT)" would be more appropriate , because "best" definitely sounds better than "low" in this context. However, the technology selected should not be such that great efforts are needed constantly just to prevent the latrine walls or floor from collapsing, like it is unfortunately often the case with "traditional latrines".

This kind of "traditional" latrines will not support the idea of improved sanitation or replicability, and it makes the use of latrine uncomfortable and unsafe. If "modern" structures can be built at a reasonable price and are more durable requiring less maintenance, the builders might find them more preferable than traditional ones.

Children's Excreta Disposal

The special attention should be paid to children's and infants' excreta disposal. Although improved latrines have been built in many areas, the health impact has been relatively small, obviously because children do not use the latrines.

Maternity wards and programmes should be used to educate especially women to dispose stools of infants properly. A separate "pre-school" latrine could be built for them or they could get to use a potty. Children would feel also safer, if latrines would be connected or built in houses. This kind of technology would offer more privacy for women required in some cultural environments, and more

conveniency to the users during heavy rains and in the dark.

Sustainability

If we think in commercial marketing terms those programmes which have not been successful, donor organizations, sponsoring agents, government officials and project managers have not met or exceeded customers expectations. For how long can the customers be kept unhappy?

The emphasis in sanitation programmes should be rather on the health promotion than just on the provision of the sanitation facilities. Although there is a huge lack of hygienic excreta disposal facilities, in particular in rural areas, the long-term objectives such as improvements in environment and health should be considered more meaningful than the number of the completed latrines.

The hardware components are only one link in a long chain. The other links involve changing hygiene habits and other factors and can require actions ranging from providing better education to promoting public health programmes. If anyone link is missing, health indicators may not improve. Where it is not possible to upgrade all links simultaneously, one must take a longer view, proceed step by step, and not expect to see large health improvements until the last step has been completed.

Although the long-term objectives should always be emphasized, the short-term objectives, like convenience, privacy and cleaner household environment should be used effectively in marketing the sanitation programmes. People tend to appreciate the immediate benefits of improved sanitation after having approved this concept.

However, some regard should be given to the considerably slow progress with sanitation programmes taking into account the fast growing population in many parts of the world, and the declining or extremely modest economic growth.

Questions should be raised also on what should be done when the sometimes heavily subsidized latrines become full, and that will happen from now onwards faster and faster.

Perhaps the number of functioning facilities is decreasing as fast or even faster than new ones are erected. Is it possible to empty the latrine? Can the materials be re-used, and to what extent? Who is going to cover the additional costs or to subsidize latrine construction once again?

If the questions can be answered, perhaps we would think also strategies, techniques and technologies a bit more differently than we do presently. The construction of sanitation facilities is to continue indefinitely anyway.

The word "sustainability" would be a bit more than just a new slogan, if the cost recovery concept would be introduced innovatively and effectively in the future programmes. Otherwise it would be better to omit the whole word in the documentation, and say goodbye to replicability.

The recommendations by the author to improve the conditions in sanitation sector regarding externally supported programmes:

1. Promote female education and autonomy.
2. Introduce legislation on environmental sanitation.
3. Carry out market survey on environmental sanitation.
4. Create dialogue between all parties involved in the community development.
5. Create market through communication/social marketing/hygiene education.
6. Satisfy demand on the market for improved facilities.
7. Support community activities and provide correct external assistance bearing in mind sustainability and replicability.
8. Subsidize/provide ONLY schools and health institutions with sanitation facilities when requested by them.
9. Strengthen the local organizations (also those at grass-root level).

10. Coordinate and cooperate with other external agencies, and host institutions.
11. Continue communication/hygiene education with a special focus on potential roles of women, and DISPOSAL OF CHILDREN'S FAECAL MATTER.
12. Enforce legislation on environmental sanitation.
13. Evaluate and revise your actions as needed.
14. Use systematically applied research in the sector projects.

> "There was a man living in a certain village, whose son was working in Lusaka. His son came to visit him and brought him a gift: a new shirt and trousers. The father thanked him profusely. Six months later the son received a parcel containing the shirt and trousers. The accompanying note read: Please, the shirt and trousers need to be washed and mended. I am waiting for your action, since I have nothing to wear".

9. REFERENCES

Anon, 1984. Using Drama to Put Across Messages about Water and Sanitation. Waterlines Vol.3 No.2.

Anon, 1986. Better Sanitation to Beat Mosquito Breeding. Waterlines Vol.5 No.1.

Armstrong, A. 1987. The Singida Project: A New Hope for A Poor Region. Waterlines Vol.5 No.3.

Asian Development Bank. 1986. Water Supply and Sanitation Sector Strategy Review. 115 p.

Batchelor, S. 1985. Introducing Appropriate Technologies Step by Step. Waterlines Vol.3 No.3.

Bartram, J. and Johns, W. 1988. Water Supply in Primary Health Care: Experiences of Amazon Indian Communities. Waterlines Vol.7 No.1.

Bidwell, E. 1988. Health for All: The Way Ahead. World Health Forum Vol.9.

Blackett, I. 1988. Co-ordinating a National Sanitation Programme: The Lesotho Way. Waterlines Vol.6 No.3.

BMZ-Federal Ministry for Economic Cooperation, FRG. 1984. Guidelines for the Planning and Implementation of Bilateral Cooperation Projects of the Federal Republic of Germany in the Drinking Water and Sanitation Sector. Bonn. 29 p.

Boot, M. and Heijnen, H. 1988. Ten Years of Experience. Community Water Supply and Sanitation Programme, Pokhara, Western Development Region, Nepal. Technical Paper No.26. IRC International Water and Sanitation Centre. Hague. 104 p.

Brandberg, B. 1985. Why Should A Latrine Look Like A House? Waterlines Vol.3 No.3.

Briscoe, J. and deFerranti, D. 1988. Water for Rural Communities: Helping People Help Themselves. The World Bank. Washington, D.C. 32p.

Briscoe, J., Feachem, R. and Rahaman, M. M. 1986. Evaluating Health Impacts: Water Supply, Sanitation, and Hygiene Education. IDRC. Ottawa. 80 p.

Bryant, J. 1988. Health for All: The Dream and The Reality. World Health Forum Vol.9.

Burgers, L., Boot, M. and Van Wijk-Sijbesma, C. 1988. Hygiene Education in Water Supply and Sanitation Programmes. Technical Paper No.27. IRC International Water and Sanitation Centre. Hague.

Cairncross, S. 1988. Health Aspects of Water and Sanitation. Waterlines Vol.7 No.1.

Caldwell, C. 1986. Routes to Low Mortality in Poor Countries. Population and Development Review, 12.

Campell, D. 1988. Data Collection for The Design of Water and Sanitation Projects in Belize. Waterlines Vol.6 No.3.

Cotton, A. and Franceys, R. 1987.Sanitation for Rural Housing in Sri Lanka. Waterlines Vol.5 No.3.

Dale, R. 1985. A Case study on the Administrative and Planning Model of HIRDEP, Sri Lanka. Hambantota Integrated Rural Development Programme. The Royal Norwegian Ministry. Evaluation Report 7.85. 41 p.

DANIDA. 1988. A Strategy for Water Resources Management. Plan of Action for Integration of Environmental Considerations into Danish Development Assistance. 58 p.

Dlangamandla, V. 1985. School Sanitation in Lesotho. Waterlines Vol.4 No.1.

Dlangamandla, V. 1988. Hygiene and Health Education in Primary Schools in Lesotho. Waterlines Vol.6 No.4.

Drucker, D. 1985. Facing The People: The Demystification of Planning Water Supplies. Waterlines Vol. No.3.

Drucker, D. 1987. People First, Water and Sanitation Later. Community Partnership in the International Decade. WHO. 38 p.

Eckstein, S. 1985. Improving Conditions of Workers on Tea Estates. Waterlines Vol.3 No.4.

Edwards, D. 1988a. CARE/USAID/Bolivia Child Survival/Rural Sanitation Project Mid-term Evaluation Workshop. WASH Field Report No.248. 97 p.

Edwards, D. 1988b. Managing Institutional Development Projects: Water Supply and Sanitation Sector. WASH Technical Report No.49. 64 p.

Edwards, D. and Pettit, J. 1988. Facilitator Guide for Conducting a Project Start-up Workshop. WASH Technical Report No.41. 91 p.

Efraimsson, J. 1987. Position Paper on Sanitation. Kenya-Finland Primary Health Care Programme. Draft 8/87. 8 p.

Eng, E., Briscoe, J., Cunningham, A, Kilapong, K. and Naimoli, J. 1987. Community Participation in Water Supply Projects as a Stimulus to Primary Health Care: Lessons Learned from Aid-supported and Other Projects in Indonesia and Togo. WASH Technical Report No.44. 56 p.

FINNIDA's Health Sector Policy Paper. Draft Report 1985. (Original in Finnish) 21 p.

FINNIDA's Education Sector Policy Paper. Draft Report 1988. (Original in Finnish) 47 p.

FINNIDA's Water Supply and Sanitation Sector Policy Paper. Draft Report 1989. (Original in Finnish) 37 p.

Finnwater Consulting Engineers. 1986. Mtwara-Lindi Water Supply Project. Proposal for the Sanitation Programme.

Frelick, G. and Jennings, H. 1988. Benin Rural Water Supply and Sanitation Review Workshop. WASH Field Report No.241.

Gibbs, K. 1984. Privacy and The Pit Privy - Technology or Technique? Waterlines Vol.3 No.1.

Government of Sri Lanka. 1987a. Annual Estimates of Revenue and Expenditure for the Years 1980 and 1987.

Government of Sri Lanka. 1987b. Pradeshia Sabhas Act No.15 of 1987.

Hasan, A. 1988. Low-cost Sanitation for a Squatter Community. World Health Forum Vol.9.

HESAWA. 1987. Rural Water Supply, Environmental Sanitation and Health Education Programmes in Kagera, Mwanza and Mara Regions, Tanzania. Agreed Minutes Between PM & 1st VPO and SIDA, December 2, 1987 and Report from Joint Review November 9-30, 1987.

Hubley, J. 1987. Communication and Health Education Planning for Sanitation Programmes. Waterlines Vol.5 No.3.

IRC. 1988. Community Participation and Women's Involvement in Water Supply and Sanitation Projects. International Water and Sanitatation Centre. Occasional Paper Series 12. Hague. 70 p.

Iseley, R. and Rosensweig, F. 1984. Training Non-technical Workers for Rural Water and Sanitation Projects. Waterlines Vol.3 No.2.

Jange, D. 1985. A Demonstration Sanitation Project in The Gambia. Waterlines Vol.3 No.4.

Kamau, R. 1983. Water and Sanitation for Urban Squatters. Sanitation and Water for Development in Africa. Proceedings of the 9th WEDC Conference, Harare, Zimbabwe, 1983.

Kampsax-Krüger, Consultants for DANIDA. 1989. Personnal Communication.

Karlin, B. 1988. Hygiene Education in Primary Schools. Waterlines Vol.6 No.3.

Katko, T. 1989. Development of Rural Water Supply in Finland: Possible Lessons for the Developing World? Discussion Paper. Tampere University of Technology. Department of Civil Engineering. Institute of Water and Environmental Engineering. Publication No.B37. 49 p.

Keinänen, A. 1983. Environmental Hygiene and Health Factors in Rural Water Supply and Sanitation Projects. A Case Study in Sri Lanka. Institute of Development Studies. University of Helsinki. Report 2/83 B. 152 p.

Kenya-Finland Primary Health Care Programme in Western Province. Report of the Mission for the Evaluation of Phase II and Appraisal of Phase III. May 1-20, 1988. 49 p.+ 23 p.

Koma, V. 1989. VIP Promotion Campaigns in Lesotho. Water, Engineering and Development in Africa. Pre-prints of the 15th WEDC Conference, Kano, Nigeria, 3-7 April 1989.

Konaté, S. 1988. Planning Health in Mali. World Health Forum Vol.9.

Kwale District Community Water Supply and Sanitation Project. 1988. Mid-term Evaluation Report. 42 p.

Land, A. and Selotlegeng, K. 1989. Addressing Rural Sanitation in Botswana. Water, Engineering and Development in Africa. Pre-prints of the 15th WEDC Conference, Kano, Nigeria, 3-7 April 1989.

Laubjerg, K. 1986. Training Village Women as Health Promoters in Tanzania. Waterlines Vol.4. No.3.

Laver, S. 1986. Communications for Low-cost Sanitation in Zimbabwe. Waterlines Vol.4. No.3.

Laver, S. 1988. Learning to Share Knowledge - A Zimbabwean Case Study. Waterlines Vol.6 No.3.

Lewis, C. 1989. Economic Growth and Health: Trends and Prospects. International Health and Development. March/April 1989.

Maber, S. 1989. Health Care and Sanitation in Peru - Developing Appropriate Technologies. Waterlines Vol.7 No.3.

Mason, J. and Cutbill, C. 1988. Design of Sociocultural Study of Household Water Use and Sanitation Practices in Djibouti City. WASH Field Report No.214. 67 p.

McGarry, M. 1986. Improved Efficiency in The Management of Technology: Technologies Appropriate to The Needs and Resources of Developing Countries. Interregional Symposium on Improved Efficiency in The Management of Water Resources. United Nations Headquarters, New York, 5-9 January 1987.

Morgan, P. 1988. Village-level Sanitation Programmes in Zimbabwe. Waterlines Vol.6 No.3.

Muller, M. 1988. Increasing the Effectiveness of a Latrines Programme. World Health Forum Vol.9.

Munguti, K. 1989. Community-level Management and Maintenance. Waterlines Vol.7 No.4.

Mustafa, S. 1985. Low Cost Sanitation in A Squatter Town: Mobilizing People. Waterlines Vol.4. No.1.

Nag, M. 1988. The Kerala Formula. World Health Forum Vol.9.

Narayan-Parker, D. 1988. Low-cost Water and Sanitation: Task for All the People. World Health Forum Vol.9.

NORAD. 1989. Water and Sanitation.Towards Better Health and Improved Quality of Life. 14 p.

Nordberg, E. and Winblad, U. 1989. Environmental Hygiene in SIDA-supported Programmes in Africa. Review and Recommendations. Draft February 1989. 59 p.

NWSDB/USAID. 1986. Guidelines for Latrine Selection and Construction. Sri Lanka. 34 p.

OECD. 1988. DAC Principles for Project Appraisal. Paris.21 p.

Okun, D. 1987. The Value of Water Supply and Sanitation in Development: An Assessment of Health-Related Interventions. WASH Technical Report No.43. Washington, D.C. 50 p.

Paqui, H. 1988. Low-cost Sanitation in Mosambique. Waterlines Vol.7 No.1.

Parker, R. 1985. Accounting for the Individual. World Water.

Pickford, J. 1988. Rural Sanitation and Development. Waterlines Vol.6 No.3.

Pillsbury, B., Yacoob, M. and Bourne, P. 1988. What Makes Hygiene Education Successful? WASH Technical Report No.55. 64 p.

Quratul Ain Bakhteari. 1984. Community Management for Sanitation. XIth International Congress for Tropical Medicine and Malaria, Calgary, Canada.

Razig, M. and AlAzharai, A-S. 1989. Efficiency and Cost Containment of Water and Sanitation in Sudan. Water, Engineering and Development in Africa. Pre-prints of the 15th WEDC Conference, Kano, Nigeria, 3-7 April 1989.

Refice Statement. 1988.

Relander, K. 1892. Terveydenhoidollisia Tutkimuksia Haapajarven Piirilaakaripiirissa I. Kuopio. In: Vuorela, 1975. (Original in Finnish).

Reynolds, K. and Reynolds, D. 1989. The Church's Role as A Non-governmental Organization. Waterlines Vol.7 No.4.

Richardson, I. 1989. Partnerships in Low-cost water Technology. Waterlines Vol.7 No.4. April 1989.

Rinne, S. 1989. The Negation Selection Model and Its Impact on The Product Development of An Investment Good. Tampere University of Technology Publications 59. Dr. thesis. Original in Finnish, Astract in English. Tampere. 96 p.

Roark, P., Baker, J., Buzzard, S. and Cauley, H. 1987. Privatization Study of the Village Water Supply and Sanitation (VWSS) Project Lesotho. WASH Field Report No.215. 113 p.

Rugimbana, A. 1989. On Site Sanitation in Africa. Water, Engineering and Development in Africa. Pre-prints of the 15th WEDC Conference, Kano, Nigeria, 3-7 April 1989.

Samura, P. 1989. Tombo Water and Sanitation Activities Review. Water, Engineering and Develoment in Africa. Pre-prints of the 15th WEDC Conference, Kano, Nigeria, 3-7 April 1989.

Scotney, N. 1986. The Art of Winning Acceptance for Improved Hygiene in Small Communities. Readers' Forum. World Health Forum Vol.7.

SIDA. 1984. Water Strategy - Water Supply Programmes for Rural Areas: Domestic Water Supply, Health Education and Environmental Hygiene. Second Edition January 1987. 23 p.

Simpson-Hebert, M. and Yacoob, M. 1987. Guidelines for Designing a Hygiene Education Program in Water Supply and Sanitation for Regional/District Level Personnel. WASH Field Report No.218. 58 p.

Simpson-Hebert, M. 1987. Hygiene Education Strategies for Region 1 for the Ministry of Public Health Thailand. WASH Field Report No.210. 50 p.

Smith, C. 1988. The Latrine Acquisition Curve: A Tool for Sanitation Evaluation. Waterlines Vol.7

Tennakoon, S. 1988. Towards Decent Housing for All. World Health Forum Vol.9.

Tillman, R., Tobin, W. and Roark, P. Domestic Water Supply and Sanitation in Irrigation Projects. WASH Field Report No.237. 42 p.

Tira, T.1988. Health for All Proves Its Worth in Kiribati. World Health Forum Vol.9.

Torres, M. and Burns, J. 1988. Social Marketing Strategies for Hygiene Education in Water and Sanitation for Rural Ecuador. WASH Field Report No.245. 65 p.

Turner, J. and Buzzard, S. 1987. Mid-term Evaluation of the CARE Water Supply and Sanitation Project in Belize. WASH Field Report No.206. 65 p.

UNDP/World Bank. 1988a. Selected Sector Issues and Proposed Research Priorities for the Framework for Global Cooperation. International Drinking Water Supply and Sanitation Decade Consultation, Hague, Netherlands, 2-4 November 1988. 48 p.

UNDP/World Bank. 1988b. Water and Sanitation: Toward Equitable and Sustainable Development. A Strategy for the Remainder of the Decade and Beyond. Washington, D.C.

UNICEF. 1982. Water and Sanitation in Slums and Chanty Towns.

University of Peradeniya. 1983. Sociocultural Dimensions of Water Supply and Sanitation. A Study Made in Sri Lanka. Intitute of Development Studies. University of Helsinki. Report 3/83 B. 309 p.

U Tin U, U Lun Wai, U Ba Tun, U Mya Win, U Thein Dan and U Than Sein. 1988. We Want Water, Not Gold. World Health Forum Vol.9.

van Wijk-Sijbesma, C. 1985. Participation of Women in Water Supply and Sanitation. Roles and Realities. IRC International Reference Centre for Community Water Supply and Sanitation. Technical Paper Series 22. Hague. 191 p.

Vijayendera, T. 1979. Latrines for The Urban Poor. Health for Millions. December 1979.

Vuorela, T. 1975. Suomalainen Kansankulttuuri. WSOY. (Original in Finnish).

WHO. 1983. Minimum Evaluation Procedure (MEP) for Water Supply and Sanitation Projects. 51 p.

WHO, Regional Office for South-East Asia. 1984. Low-cost Water Supply and Technology: Pollution and Health Problems. SEARO Regional Health Papers No.4. New Delhi. 40 p.

WHO, Regional Office for South-East Asia. 1985. Achieving Success in Community Water Supply and Sanitation Projects. SEARO Regional Health Papers No.9. New Delhi. 67 p.

WHO. 1986. The International Drinking Water Supply and Sanitation Decade. Review of Regional and Global Data (As at 31 December 1983). WHO Offset Publication No.92. Geneva. 30 p.

WHO/GTZ. 1987. Global Sector Concepts for Water Supply and Sanitation. 16 p.

Whyte, A. 1986. Guidelines for Planning Community Participation Activities in Water Supply and Sanitation Projects. WHO Offset Publication No.96. Geneva. 53 p.

Winblad, U. 1987. Sanitation and Health. A Study of Three SIDA Supported Programmes in Kenya. 26 p.

Winblad, U. 1989. Manicaland Health, Water and Sanitation Programme. Assessment and Possible Continuation. 29 p.

Winblad, U. and Kilama, W. 1985. HESAWA Sanitation Study. 23 p.

Winblad, U., Olsson, P. and Edstrom, G. 1988. Manicaland Health, Water and Sanitation Programme. Mid-term Assessment and Pre-feasibility Report. 34 p.

Wiseman, R. 1988. Latin Crisis "Needs Political Priority". World Water. November 1988.

World Bank. 1988. Annual Report 1988. Washington, D.C. 207 p.

World Health Organization. 1983. Maximizing Benefits to Health: An Appraisal Methodology for Water Supply and Sanitation Projects. Geneva. 45p.

World Health Organization. 1986a. Guiding Principles for National Monitoring of the Water Supply and Sanitation Sector. Geneva. 24 p.

World Health Organization. 1986b. Intersectoral Action for Health: The Role of Intersectoral Cooperation in National Strategies for Health for All. Geneva. 154p.

Wright, A. 1984. Development and Implementation of Low-cost Sanitation Investment Projects. Report of Mission to Tanzania, September 10 to October 14, 1983. 79 p.

Yacoob, M. and Porter, R. 1988. Social Marketing and Water Supply and Sanitation: An Integrated Approach. WASH Field Report No. 221. 28 p.

Yohalem, D., Hafner, C. and Henriquez, J. 1987. Improving Peace Corps' Water Supply and Sanitation Programs. WASH Activity No.314. 33 p.

RECOMMENDED BACKGROUND READING

Burgers, L., Boot, M. and Van Wijk-Sijbesma, C. 1988. **Hygiene Education in Water Supply and Sanitation Programmes.** Technical Paper No.27. IRC International Water and Sanitation Centre. Hague.

Abstract

Based on more than 550 documents, this literature review together with the selected and annodated bibliography gives an overview of current knowledge and experience in hygiene education in community water supply and sanitation projects. The review covers a range of documents including unpublished reports and other material of limited access. Aspects covered include importance and purpose of hygiene education, various target groups, changing hygiene related behaviour, approaches to hygiene education, organization and cost of programme, manpower and training require, use of audio-visual tool, and school hygiene education. A range of abstracts have been included to facilitate access to information on trends, experience and constraints in hygiene education in the sector.

van Wijk-Sijbesma, C. 1985. **Participation of Women in Water Supply and Sanitation. Roles and Realities.** IRC International Reference Centre for Community Water Supply and Sanitation. Technical Paper Series 22. Hague. 191 p.

Abstract

A comprehensive review of 775 documents has indicated many aspects of traditional involvement of women in water supply and sanitation, which have implications for projects and programmes designed to improve these provisions. Their traditional involvement demonstrates that women have a potential role in such projects which will benefit both the project and women themselves and which will contribute to wider development. Comparison of their actual participation with these potential roles shows the contribution made

by women to planning and design, construction, maintenance and management of improved water supply and sanitation and to health education, and denotes areas for further development and research.

Boot, M. and Heijnen, H. 1988. **Ten Years of Experience. Community Water Supply and Sanitation Programme, Pokhara, Western Development Region, Nepal.** Technical Paper No.26. IRC International Water and Sanitation Centre. Hague. 104 p.

Abstract

The development and achievements over a ten-year period of the Community Water Supply and Sanitation Programme, Pokhara, in hill areas of the Western Region are documented. The programme concerns gravity fed water supply schemes with public tapstands, and school and household latrines. It is a joint effort of four parties: rural communities, the Nepali Government, and donor organizations UNICEF and SATA/Helvetas.

Programme developments are traced from initial focus on standardization of design and procedures with due attention to manpower training and recruitment. Over the ten-year period the emphasis has changed increasingly to promotion of sanitation and maintenance with due attention to rehabilitation of completed schemes. More recently personal and environmental health have been promoted as a means to increase the benefits of new water supplies. Experience in this community based, low-cost programme shows how the committed effort of all parties has made steady and sustained progress in building and extending the programme.

Briscoe, J. and deFerranti, D. 1988. **Water for Rural Communities: Helping People Help Themselves.** The World Bank. Washington, D.C. 32p.

Abstract

Efforts to improve the water supplies used by

people in rural areas in developing countries have run into serious obstacles; not only are public funds not available to build facilities for all, but many newly constructed facilities have fallen into disrepair and disuse. Along with the numerous failures there are also successes in this sector. From these successes a new view has begun to emerge of what the guiding principles of rural water supply strategies should be.

This book brings together and spells out the constituents of this emerging view. The central message is that it is the local people themselves, not those trying to help them, who have the most important role to play. The community itself must be the primary decisionmaker, the primary investor, the primary organizer, and the primary overseer. The authors examine the implications of this primary principle for the main policy issues- the level of service to be provided in different settings, the level and mechanisms for cost recovery, the roles for the private and public sectors, and the role of women.