

A UNICEF PUBLICATION ON WATER, ENVIRONMENT, SANITATION AND HYGIENE

Contents

Safe water for every family as a human right: How do we put aspiration into practice?	1
Cleaning up Patna city: the Chakachak Patna Abhiyan citizens' initiative	2
Is 'all or nothing' the right approach to rural water supply? Lessons from Zambia	4
Meeting basic needs in Sri Lanka through domestic roof water harvesting	7
The demand-responsive approach in Mozambique: Why choice of technology matters	9
Mobilizing Madagascar households to disinfect their drinking water	11
Monitoring water quality in ten Uganda towns	13
Sanitation, Hygiene and Water Quality in Schools and in the Community, Uzbekistan	15
The challenge of teaching hygiene in two Laos villages	17
Towards child-friendly latrines in Viet Nam	18
Safeguarding water quality in rural Guinea	20
Continuing crisis in southern Africa: New UN appeal	21
World Water Day 2003	22
New publications	23
Ode on the prospect of Rupert Talbot retiring	24
e-conference excerpts	24
Young people speak out in Kyoto	28

Safe water and basic sanitation for every family as a human right: How do we put aspiration into practice?

We are now halfway through the International Year of Freshwater and we have seen the groundswell build to a virtual flood of concern for the daunting task of belatedly safeguarding one of the most vulnerable of our planet's resources – the freshwater that represents only 2% of the water on earth, jeopardized by decades of pollution of surface waters and unsustainable draining of underground aquifers. This combined with other statistics – an estimated 1.1 billion of the world's population lack access to safe drinking water; 2.4 billion without secure sanitation; and millennium development goals that aim to halve these rates by 2015, when the world's population is expected to grow by another billion and water demand is increasing at three times the rate of population growth over that period – has created substantial challenges.

The Third World Water Forum

This issue of WATERfront reports on issues and actions discussed at the Third World Water Forum held from the 16th – 23rd of March in Kyoto. The 24,000 participants from 182 countries who met in Kyoto – including a multi-national delegation from UNICEF – debated practical solutions, large-scale and small-scale, against a series of statistics flagging the urgency of their work.

UNICEF Executive Director, Carol Bellamy attended in Kyoto and delivered a keynote speech at the opening plenary giving strong impetus to provide clean water and sanitation



to the poorest people on the planet, as a vital step in reducing poverty and ensuring education for all children. Other UNICEF contributions included organizing a session on Household Water Security and Basic Sanitation and Hygiene, the launching of the WASH in Schools initiative with the Water Supply and Sanitation Collaborative Council and, for the first time, the joint Government of Japan and UNICEF sponsored Children's World Water Forum – the Children's Water Manifesto is provided on the back page of this issue.

The Kyoto Forum benefited from discussions and outcomes from a number of international conferences preceding it: the Millennium Summit of the UN (2000), the International Freshwater Conference in Bonn (2001), and the World Summit for Sustainable Development in Johannesburg (2002). These previous events helped to provide an analytical framework for water issues, and the Kyoto Forum focussed on the outcomes of these conferences to propose initiatives for direct action.

The output was immense: a Forum Statement which encompassed 33 different themes

continued on page 25

Cleaning up Patna city: the *Chakachak Patna Abhiyan* citizens' initiative

by Dipak Roy, WES project officer, UNICEF Patna

Patna, capital of Bihar state, had a glorious past as an important religious centre and the seat of power of one of the oldest kingdoms in India. But conditions have deteriorated over the years. Lacking the income to fund civic services, the municipal corporation is hard pressed to cope with the estimated 650 tonnes of solid waste generated each day by a population of some 1.7 million. Garbage piling up all over the city presents a dismal picture and poses serious environmental hazards. And sanitation services are frequently disrupted by municipal workers going on strike to protest erratic payment of their wages.

Partnerships for a cleaner city

In October 2001, the UNICEF field office for Bihar hosted discussions between the many stakeholders concerned about the city's problems with solid waste – representatives of non-governmental organizations (NGOs), city and state officials, and community leaders. From these discussions the *Chakachak Patna Abhiyan* (Clean Patna Campaign) was born. Rather than set up yet another organization specifically for the campaign, the initiators decided instead to form a network, the individual organizations each bringing their existing priorities and skills to the common cause. One NGO – NIDAN, an NGO alliance headquartered in Patna – acts as secretariat and coordinates all the partners.

The network's primary objective was to create a platform for civic action. The network acts as a pressure group for waste management and provides an interface between neighbourhood groups and local government. Since trucks cannot enter the narrow lanes of many Patna neighbourhoods, the network also mobilizes residents to deposit

their household garbage not in the lanes but in community bins, where the municipal garbage trucks can then collect it for final disposal. And lastly, the network has undertaken to help improve conditions for the rag pickers who play a major role in sorting and recycling the city's garbage.

Opportunities

The network developed its strategy for action around a number of opportunities already in place:

- Several groups in isolated neighbourhoods were already engaged in garbage collection and intermediate disposal, and stood to gain from pooling their experience
- Various residents' associations were already organizing their own garbage collection, not yet linked to the municipal system for final disposal
- The three-day Chhat festival around November – an important religious festival for the Hindu population in this part of the country – is marked each year by spontaneous community action to clean up the entire city. The Chhat festival was used as the springboard to launch longer-lasting community action
- An estimated 80% of Patna's household waste is organic and could be composted for sale as fertilizer.

Creating awareness for action

A major thrust of the campaign is to raise awareness of the need to keep Patna clean and to improve civic amenities, as a step towards reinforcing citizens' pride in their city. The network produced a calendar for 2002 which carried illustrations of Patna's historic

landmarks and was used as promotional material to announce the *Chakachak Patna* initiative. This concept worked very well, giving the campaign an identity that went beyond simple garbage disposal.

The network organized advocacy events for World Water Day and World Environment Day that brought together schoolchildren and bodies like the Institute of Engineers to publicize the issues surrounding water quality and conservation and the threats to freshwater resources. These events attracted good coverage by the media.

Schools as a tool for change

Meetings with schoolchildren, principals and teachers are part of the campaign. Debates and quiz competitions on solid waste have been organized in 96 schools.

Towards the end of 2002, nearly 1,500 of the city's schoolchildren were selected and trained to conduct a simple survey of basic attitudes to sanitation in a cross-section of Patna households. With assistance from the school authorities, the students contacted more than 20,000 households.

The survey findings were presented to the state legislature in December. Fully 81% of respondents were dissatisfied with existing conditions and wanted sanitation improved; 36% were ready to pay a fee to have their neighbourhood kept clean. The survey also showed that 54% of respondents knew about the *Chakachak Patna* campaign.

Drive against polythene bags

Over the last two decades the city's shops have taken to handing out bags of thin polythene (less than 20 microns thick) for even the smallest purchase. Banned by local ordinance but the ban not enforced, these bags consist largely

of recycled polyethylene. They are too flimsy to safeguard food hygiene and when thrown away they clog the city's stormwater drains and sewers, especially during the rains.

The Chakachak Patna network joined forces with the district administration to discourage the plastic bags. Advocacy meetings with stationers, greengrocers and food vendors reminded them of the ban; handbills and posters informed the public of the damage done by the polythene; schoolchildren carried the message home. To support the move, paper and cloth bags bearing the campaign logo were issued to shopkeepers. Old newspaper was recycled for the paper bags; for the cloth bags old linens and bedsheets were collected from households, cleaned, dyed, re-sewn into bags, and sterilized. The district administration then took action against traders defying the ban.

The use of polythene dropped dramatically within a very short time. What legislation alone could not achieve, collective social action made possible.

Better conditions for rag pickers

Patna's estimated 10,000 rag pickers are integral to the city's system for managing solid waste. They sort the garbage and scrape a meagre living from selling the recyclable components.

The Chakachak Patna network is assisting the rag pickers to form cooperatives, in order to improve their insanitary working conditions and increase their earnings and bargaining power. Progress so far:



Polio vaccine being administered to children of rag pickers.

- The network is providing group insurance cover for 304 rag pickers who have taken up the new approach
- 51 rag pickers have formed a cooperative with its own depot where the members can market their recyclables direct, eliminating intermediaries
- 115 women rag pickers have pooled their savings to create 14 self-help groups. Five of these groups have obtained loans from the Rashtriya Mahila Kosh, a national women's funding institution for self-help groups.

After a survey showing that the rag pickers and their children received little health care, the Chakachak Patna network arranged with the city health services to have the children fully immunized. Medical camps were organized for rag pickers in four neighbourhoods to brief them on child health care, prenatal and postnatal care, and planned parenthood.

Advocacy with elected representatives

Municipal elections were held in spring 2002 for the first time in 18 years. At election meetings held in each ward, every candidate running for ward councillor was presented with a ten-point Chakachak Patna charter of citizen demands for sanitation, to place the issue squarely on the election agenda. Follow-up meetings have been arranged for this year to remind the new councillors that they pledged a clean environment to their constituency.

Lessons learned

The Chakachak Patna campaign has been a rewarding experience, disproving the cynicism it met with when it started up in late 2001.

The initiative has shown that it is possible for a group of disparate



Neighbourhood meeting before the municipal elections in early 2002.

NGOs to come together on a common platform while retaining their individual identities and priorities. For instance, the network includes six NGOs whose strength lies in organizing media events; these six have lent their support by mounting street plays and the special events for World Environment Day and World Water Day. Two other NGOs in the group spearheaded the drive against shopkeepers' use of throwaway polythene bags.

Bringing NGOs and government together to collaborate in harmony was another challenge. The municipal corporation was initially sceptical and mistrustful, but reconsidered its position after a strike by municipal workers when the NGOs provided back-up help to the corporation for emergency street cleaning. The corporation is currently considering outsourcing to NGOs some of the responsibilities for neighbourhood garbage disposal.

The Chakachak Patna network has not needed aggressive posturing to encourage city agencies to become more proactive. Public-interest litigation was originally contemplated as a possible tactic, but was abandoned in favour of collaboration with the corporation to complement existing municipal efforts.

After little more than a year, the modest but noticeable achievements of the Chakachak Patna initiative have inspired community action in several other towns of Bihar, where citizen groups have launched similar campaigns using similar strategies adopting Chakachak as their catchword. 🌐

HOUSEHOLD WATER SECURITY: LESSONS LEARNED

Is 'all or nothing' the right approach to rural water supply? Lessons from Zambia

by Sally Sutton, SWL Consultants

The current emphasis in rural water supply is to provide relatively expensive, high-specification systems for everyone – mainly boreholes with handpumps, or fully lined wells with handpump or bucket and windlass. Everyone with access to these systems is defined as 'served' and coverage figures are based on the proportion of the population to which this applies, regardless whether these 'improved' systems supply safe and reliable water or not. Larger communities tend to be targeted first in order to serve as many people as possible and increase the chances of sustainability.

Achieving the millennium development goal of halving those without access to safe water by 2015 will require triple the investment in water supply made in the 1990s, and this is unlikely to be available. Smaller villages (less than 30 households, say) may wait for

decades for to acquire water supplies protected in this way: according to the WHO/UNICEF global assessment for 2000, sub-Saharan Africa has seen safe water coverage increase by 70 million over the past decade, but the number without access (as defined by the level of technology) has also increased, by over 20 million. Among the large numbers living in poorer communities, the current emphasis on particular technologies and definitions of coverage leads to conflict between sustainability and the right to safe water. This discourages any initiatives to make lower-cost improvements that can provide water far safer and more accessible than the water available at present.

Innovative strategies therefore need to be considered which can improve the water supply for larger numbers of people, rapidly and at low cost. One option is the greater employment of local skills and resources, combined with better understanding of what the 'unserved' do at present with their 'unprotected' supplies.

Upgrading existing sources presents the opportunity to improve the technology in stages, in 'bite-sized' steps that the end-users can afford and appreciate. (The Mvurumanzi Trust in Zimbabwe has adopted a similar approach for its family wells programme.) The upgraded sources can then offer water quality as good and sometimes better than the quality offered by many protected wells that are regarded as 'safe' and included in the coverage figures. They can even do this in a replicable fashion, relying on little or no subsidy. The approach may not provide a perfect engineering solution, but the question that should be posed is whether people in small communities should passively wait

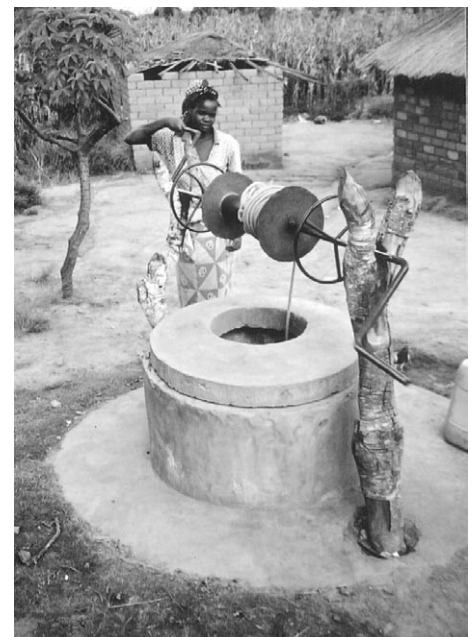
many years for a 'perfect' but often unsustainable solution. Until such perfect systems are attainable and affordable, is it not better to encourage and assist poorer communities to improve their existing systems. Even a minor adjustment can nonetheless represent a significant relative improvement to their water supply and its convenience for use. This would entail widening the technology options and would blur the distinction between the haves and the have-nots in the coverage figures. But it offers a more sustainable route towards improving water supplies and making better use of indigenous skills and resources.

The research project

In Zambia, as in many other developing countries, the number of people without access to safe, reliable water (as defined by type of technology) has remained virtually the same for two dec-



Unimproved water source.



Villagers' choice of refurbished well

ades – and this despite very large inputs by donors. The smallest and poorest communities carrying the least influence tend to remain unserved and are unlikely to be served in the foreseeable future. Yet these communities have the same aspirations to improve their quality of life as their larger neighbours.

A research project funded by the UK Department for International Development (DFID) therefore looked at the sustainable alternatives for safe drinking water open to these communities. The project effectively shifted attitudes at every level towards low-cost alternatives, in tandem with developing and promoting lower-cost technologies using local and other low-cost materials.

The key findings:

- Traditional water sources usually present lower risks than had been assumed. Indeed, they sometimes offer better water quality than the protected sources designed to replace them
- At low cost – often as little as \$30 – a traditional source can be made as safe and almost as reliable as conventionally protected lined wells
- There is significant demand from users to improve their existing sources
- Government personnel, who initially felt the approach to be retrogressive, have begun to see it as a way to increase coverage in a sustainable fashion for people they cannot yet assist by any other means
- Communities have begun to identify their assets and make plans to improve their situation themselves, rather than waiting on hand-outs from donors. Nevertheless, small subsidies have also proved to be an effective incentive for action, rather than words alone
- Far from being a drain on villagers' very limited cash, upgraded water sources can become focal points for generating income.

The researchers surveyed over 2,000 water sources and studied the users'

knowledge, attitudes and practices in 20 villages; the pilot project developed from their findings carried out improvements to the water sources used by some 200 villages. The improvements included partial or full lining, construction of aprons and drainage, covers for wellshaft openings and scoopholes, and posts to hang a bucket and rope or other device to lift water. These practical measures were combined with community discussions on maintaining hygiene both around the source (including arrangements for handwashing) and while collecting their water, and also on setting their own standards and rules. Management issues proved as important as the technical issues for stimulating change, but in both cases the community decided which changes to make, with advice from extension workers if requested.

The graphic illustrates the impact on water quality of partial lining of wells: within four months of the upgrade, nine out of ten water samples were totally free of faecal coliform bacteria or contained fewer than 10 coliforms per 100 ml. Scoopholes have become three times more reliable at yielding water. The handwashing arrangements installed at

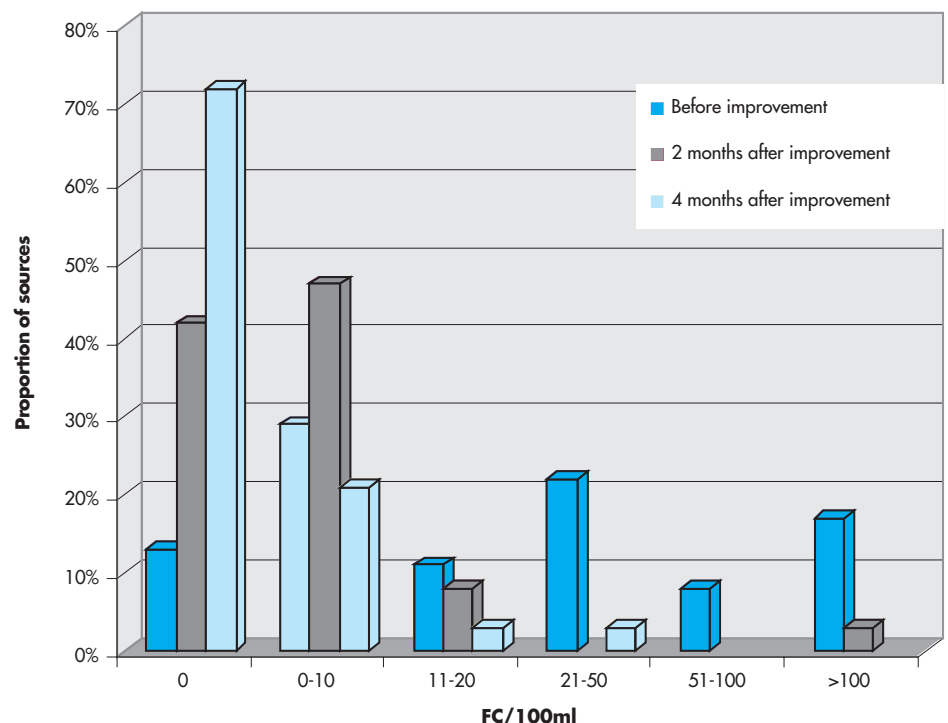
some sources have also had an impact on water quality.

Impact of the research

In response to the findings, the Zambian Government and donors are now funding source improvements in nearly every province, having initially opposed the idea as running counter to policy. To the credit of several government departments, they participated fully in the research and adjusted their views as a result.

This year alone some 1,000 source improvements are scheduled for one province, Luapula, which has always been the most cholera-prone and has a high number of unlined wells, each serving only a few households. These upgrades will benefit over 80,000 people at less than \$4 a head. Two of the district councils in areas where the approach was tested have asked donors to redirect a small share of the funding earmarked for boreholes towards upgrades for smaller communities instead. For the cost of one borehole supplying a maximum of 200 people, upgraded sources can benefit 10 to 20 times that number living in small villages. UNICEF, Ireland Aid, SNV Netherlands

Water quality changes with partial lining of wells (60 sites)



Development Organization, WaterAid and the US Peace Corps have joined forces with the Government to promote the approach within Zambia.

The project has had other effects. Health workers are now concentrating more on hygiene education than on chlorination during cholera outbreaks, realizing that the water sources are a lesser risk than poor hygiene. Furthermore, villagers have seen that they can obtain good water at low cost and have begun to dig their own wells, improving access and convenience, while others are carrying out step-by-step improvements as their resources permit. All the upgraded wells have seen a big rise in the number of users.

The new approach allows a rapid response to demand from small villages. Eventually it is hoped that the funding will come available to supply them with higher-technology alternatives. But in the meantime, the lower-cost approach has brought significant and sustainable improvement of their living conditions, and carries the potential as well that the inhabitants of these smallest and poorest of villages will now be able to increase their incomes. The concept will need time to become established, but in Zambia it has begun to take root.

Feedback, please


In conjunction with the Government of Zambia, the research project has produced two manuals for fieldworkers.

Encouraging change: Sustainable steps in water supply, sanitation and hygiene provides a structured approach to the process of problem analysis and solution, and building communities' confidence and capacity to be leaders of change. *Low-cost water source improvement* provides technical guidelines. Both manuals are published by TALC (Teaching Aids at Low Cost – talc@talcuk.org).

DFID has expressed interest in exploring a similar approach with other developing countries. We are therefore keen to learn of others' experiences, share and disseminate information, generate debate and receive feedback.

One idea is to offer the manuals for use and modification in other countries. The process of customizing them to the local context could also involve decision makers in the appropriate research, stimulate debate on the approach and encourage its adoption by a wide range of partners – communities, national government, district authorities and non-governmental organizations both local and national. The next stage could be an interactive CD offering guidelines on customizing.

If readers see scope for this approach in the country where they work, or

would like more information on the concept in general, please e-mail sally@ssutton.fsbusiness.co.uk. 

Note: This document is an output from a project funded by the UK Department for International Development (DFID) for the benefit of developing countries (project KAR 7128: Community-led Improvement of Rural Drinking Water Supplies). The views expressed here are not necessarily those of DFID or UNICEF.

On the issue of sustainability the role of community management cannot be over-emphasized. Experience has shown that projects are better managed and sustained where communities are organized and have a sense of ownership.

Mohammed Kamfut, e-conference, October 2002

Thousands have lived without love, not one without water.

W.H. Auden



Improved water source.



Beneficiaries of safer, more reliable water source.

HOUSEHOLD WATER SECURITY: LESSONS LEARNED

Meeting basic needs in Sri Lanka through domestic roof water harvesting

by Rajindra de S. Ariyabandu, Director, Policy and Planning, Water Resources Secretariat, Sri Lanka

The International Covenant on Economic, Social and Cultural Rights has recently adopted the tenet that the human right to safe water is “prerequisite to the realization of all other human rights”. Hence it is the duty of the State to provide adequate safe water at affordable cost to its population.

The Government of Sri Lanka, in keeping with this principle, has embarked on a focused attempt to provide water to all by 2015. While annual rainfall in Sri Lanka averages more than 2 metres a year, it varies by season and by year and some regions suffer drought: equitable distribution of water to all at all times has so far proved impossible. At present, 5% of the gross domestic product is allocated for developing the water supply sector, but the nation’s demand for water has far exceeded our institutional and financial capacity to meet the demand. It is estimated that

700 million rupees (roughly \$7 million) will be needed each year for the next five years to meet the goals.

Sri Lanka’s non-agricultural demand for water is expected to increase to 1 billion gallons per day by 2025. Some 80% of this demand will be met from surface water sources, while groundwater is expected to supply 17% of the demand. The remaining 3% will be met from other sources, and domestic roof water harvesting is slated to play a major role.

Development of roof harvesting in Sri Lanka

Rainwater harvesting is not new to Sri Lanka. The best early evidence is the rainwater ponds of the fifth-century rock fortress of Sigiriya. Ever since that era, rainwater has been harvested in rural areas to supplement the household water supply from other sources.

Household methods of collecting rainwater have traditionally differentiated the water collected for drinking from the water collected for other household uses: in recent years rainwater for drinking was collected directly from the skies by constructing open-air catchments on rooftops and storing the water in small rectangular cement tanks or 200-litre galvanized iron drums.

The period since economic liberalization in 1997 has opened up the rural areas to donor-funded programmes for developing social infrastructure. These programmes supplied dug wells, tubewells and piped water systems in rural areas. As a result, 70% of the nation’s population now has access to some form of safe water, but a sizeable portion of the rural population remains unserved for a variety of social and economic reasons.

In 1995, a community water supply and sanitation programme sponsored by the World Bank provided household water to rural settlements in the central hills of Sri Lanka. Since the siting of the settlements precluded serving every household, roof harvesting was introduced as an option for those households beyond the reach of the new water supplies. ‘Some water for all, rather than more water for some’ was the underlying concept.



Surface ferrocement tank storing roofwater for household use and home gardening: capacity 5,000 litres



Underground domed brick tank storing roofwater for household use: capacity 5,000 litres

Roof harvesting goes national

The success of the roof harvesting initiative in the central hills provided the impetus for Sri Lanka's current national programme. The concept was rapidly picked up not only by government but also by non-governmental organizations (NGOs) both local and international.

One of the main reasons for this quick uptake of the approach is the low-cost, easy-to-manage technology that has been introduced for constructing storage tanks. Two standard designs in particular have become very popular with users – a surface ferrocement tank and an underground brick tank, both storing 5,000 litres (see photos).

The National Water Supply and Drainage Board, Sri Lanka's chief provider of water for household use, has incorporated roof harvesting into its policy for rural water supply. Furthermore, all of the rural water supply projects sponsored by the Asian Development Bank now include roof harvesting as a standard option wherever conventional water supply is not feasible for technical, social or economic reasons.

With roof harvesting now embraced as a viable option, chiefly for rural areas, 13 of Sri Lanka's 25 districts have become home to over 15,000 domestic roof harvesting systems. Besides the household systems, roof harvesting tanks have been installed for 20 rural schools. These tanks serve the dual purpose of providing water for the schoolchildren as well as educating the future generation on the collection of rainwater for domestic purposes.

Community-based approach

Given Sri Lanka's already strong tradition of community-based development, the roof harvesting projects have followed a community-based, demand-responsive approach. In almost every case, community-based organizations and other partners have worked closely with the project developers on community sensitization. Communities were originally contributing about a fifth of the total costs, the remaining 80% being subsidized by the project development

partners. But as roof harvesting has proved its value, some communities whose need was especially acute have contributed half the costs.

Impact on household water security

If household water security is defined as accessibility, reliability and timely availability of adequate safe water to satisfy basic human needs, the majority of Sri Lanka's rural households are grievously water-insecure. At least one of these conditions is not met, sometimes none of these conditions is met.

But roof harvesting can do much to offset the hardship. My own research in several rural districts found that during the dry season, villagers might have to walk on average fully nine kilometres and spend three hours to fetch the day's water for a single household (see chart) After roof harvesting was introduced, these same villagers were averaging just over three kilometres and spending little more than an hour to fetch the day's supply. This represents a significant reduction in the time and energy required to meet the household's water needs.

Roof harvesting has therefore improved the water supply for rural households: a sizeable share of the day's water requirement now lies within easy reach, and that water of safer quality for drink-

ing, since rainwater collected from roof runoff has proved better than the water from traditional sources. The technology is affordable for most rural households. Furthermore, roof harvesting has potential for redressing a gender inequality; fetching water is a task traditionally assigned to women and girls, but when some water is stored close at hand, anyone in the family may collect it.

Other implications of roof harvesting

In most instances the time saved in fetching water has served to improve the physical quality of life. Freed from much of their duty as water carrier, women can devote more time to their household responsibilities, tending their children and seeing to their family's well-being. Water is traditionally fetched also by children, notably girls: rural children are often kept out of school to collect the family's water during droughts, which sets back their education. Roof harvesting can therefore help to protect the rights of children to schooling and to leisure time. It can also ease living conditions for the elderly and the disabled.

Besides these qualitative improvements to life, roof harvesting has also made a contribution, albeit a modest

continued on page 19

Fetching water in the dry season for a rural household in Sri Lanka

District	Minutes per trip	Metres per trip	Before roof harvesting			After roof harvesting			Hours saved per day
			Trips per day	Km per day	Hours per day	Trips per day	Km per day	Hours per day	
Badulla	20	363	8	2.9	2.7	3	1.1	0.9	1.7
Matara	24	516	5	3.2	2.1	3	1.9	1.2	0.8
Kandy	58	800	4	3.2	3.2	2	4.2	1.5	1.7
Mona'gala	28	389	5	1.9	2.3	2	1.7	1.0	1.2
Ham'tota	37	1,820	5	9.1	3.0	2	3.3	1.3	2.1

All rates are averages, rounded: research completed in 2000.

HOUSEHOLD WATER SECURITY: LESSONS LEARNED

The demand-responsive approach in Mozambique: Why choice of technology matters

by Edward D. Breslin, WaterAid, Mozambique

The demand-responsive approach has become the cornerstone of government and donor policies throughout the world. The shift from supply-driven water supply interventions to programmes rooted in demand is easily understood. In general, supply-driven interventions have not succeeded in providing poor communities with sustainable water supplies. Projects consistently fall into disrepair because communities do not feel they are responsible for the project or because they do not have the capacity to sustain the water point. Millions of dollars have been wasted as communities watch schemes, implemented on their behalf, fail.

The core philosophy of the demand-responsive approach holds that communities must take greater responsibility for the actions and decisions that will affect their lives. These decisions – on such issues as choice of technology, management structure, tariffs, O&M, and responsibility for replacing outworn parts – will no longer be imposed on communities by players from outside the community, but will be made and ‘owned’ by the community. The decisions will reflect what communities think they can manage and sustain, not what outsiders think they should manage and sustain.

The situation in Niassa province

Water point sustainability has proved elusive in Mozambique. To its credit, the Government has made great strides in attempting to address the core reasons for project failure. And nowhere is this clearer than in relation to technolo-

These decisions – on such issues as choice of technology, management structure, tariffs, O&M, and responsibility for replacing outworn parts – will no longer be imposed on communities by players from outside the community, but will be made and ‘owned’ by the community.

gies. The Government’s demand-responsive policy recognizes that no technology is perfect and that no one technology is appropriate for all contexts. Instead, Mozambique’s policy argues that technologies need to be matched to the needs and capacities of the community and that the community itself is best placed to decide what is most appropriate for its particular context. This is fundamental to the demand-responsive approach.

WaterAid has been working since 1996 in Niassa province with a range of governmental, private sector and non-governmental partners. Located in the north-west, Niassa is the nation’s most sparsely populated province (population just over 800,000 in 1997). The province is characterized by poor infrastructure, a weak cash-based agricultural economy, and political and social isolation. According to the Government’s *Action plan for the reduction of absolute poverty 2001–2005*, published in April 2001, Niassa has some of the nation’s highest rates for absolute poverty, illiteracy (particularly among women),

infant mortality and lack of access to safe drinking water.

Since 1999, WaterAid’s government and non-governmental partners have been testing the country’s new policy and implementation manuals in five Niassa districts. Over this period, the choice of technical options offered to communities has expanded to include the Afridev handpump, protected wells with bucket and windlass, and most recently a pump worked by rope.

Past failures

We have found that technology choice does matter, and that communities can make informed choices on which level of service is most appropriate for them. Most importantly, we are finding that O&M has greatly improved when communities are allowed to pick a technology that they believe lies within their financial, managerial and technical capacity to sustain.

The decision to expand the technical options proved a revelation in Niassa province, since many communities here simply cannot sustain an Afridev handpump. The reasons for this are complex but generally involve some combination of the following factors:

- Extremely high O&M costs (the network for obtaining spare parts is virtually non-existent in Niassa)
- Minimal household incomes, which means that the cost of spare parts has to compete with other family needs since families have little cash
- Dispersed settlement patterns, which further raise the O&M costs per family

- Easy access to alternative (unprotected) water sources, which many households rate acceptable when set against the high O&M costs of a handpump and the family's other financial needs
- Poor back-up support. Some technical problems lie beyond the capacity of a community to address. Handpumps fail in Niassa because this back-up support cannot be provided in many districts.

Many communities therefore accepted Afridev handpumps as a short-term benefit. They would use the handpump until it failed and then return to the rivers, traditional wells and swamps for their household water needs. The handpump was seen as useful for a time but lives were not permanently changed because the pump eventually failed. Many communities simply wrote off the pump. They were thankful to have it for a while but never had any intention of sustaining it because the costs were too high for them.

Current successes

This has changed with the introduction of new options. Better-off communities closer to towns still opt for Afridev handpumps, but isolated rural villages have increasingly chosen protected wells. Protected wells are inexpensive to maintain and simple technologically; they do not require special equipment or complex training. Spares are not a problem since ropes and buckets can be bought from almost any private vendor in the province.

In fact, protected wells have proved so popular that over the past two years, 37 villages with broken handpumps have asked for their failed handpumps to be replaced by protected wells. Many villages would rather have a regular and reliable supply of water that they can sustain, than a handpump that supplies potentially higher-quality water but is unreliable and too expensive to sustain over time.

After three years, only two of the 146 protected wells constructed over the period have fallen into disrepair because

Better-off communities closer to towns still opt for Afridev handpumps, but isolated rural villages have increasingly chosen protected wells. Protected wells are inexpensive to maintain and simple technologically; they do not require special equipment or complex training.

of technical problems that the community should remedy. Evidence of O&M is high as well – with new ropes on the windlasses and new buckets down the wells. And in some communities, Afridevs are being better managed because communities made significant capital-cost contributions that demonstrated their commitment to this more expensive option. They are repairing their pumps and have designed O&M systems that are locally appropriate and accepted. These are encouraging signs in a province historically characterized by project failure.

Challenges remaining

WaterAid's partners face a range of challenges as they move ahead. First, the decision to introduce rope pumps is important since it further increases the options available to villages. Probably some villages that have chosen a protected well would like a higher level of service that is nonetheless easier to sustain than an Afridev: the rope pump offers such an option. The challenge will be to ensure that high-quality rope pumps are manufactured locally and that the rope-pump manufacturers respond to the technical problems that will inevitably arise as they gain experience in mass producing this new type of pump.

Second, some donors and the Government have legitimate worries about protected wells. In particular, some worry that protected wells can be easily contaminated by litter and other debris falling into the well and contaminating the water. And some worry that protected wells can spread cholera. The

argument is that a bucket handled by someone with cholera and lowered into the well might contaminate the water and cause a broader outbreak in the community.

While the argument about cholera is erroneous, these fears need to be addressed. It would be foolish to dismiss such concerns outright. The threat of water contamination is undoubtedly greater for protected wells than for wells with operational handpumps, but the issue of sustainability has to be considered: a village using a protected well has far better water quality than a village with a failed handpump that returns to collecting its water from a polluted river. It should be remembered that many countries, including Mozambique's neighbours, have had similar qualms about protected wells. Mozambique is hardly alone in worrying about standards of water quality.

These concerns have to be addressed by a rigorous programme for monitoring water quality. Such a programme has been established in Niassa and early results are positive. Tests over a six-month period showed that the risk to water quality in protected wells is overstated, since these projects were linked up with effective hygiene promotion activities. Nevertheless, these results need to be sustained over time. WaterAid's partners have therefore decided to suspend the protected well option in rural areas for 2003, until the water quality results are better understood and accepted nationally. This should not be much of a problem if the rope pumps prove viable.

Third, communities are not homogenous. WaterAid's partners have found that many communities do not agree on one particular option. Gender considerations are especially critical here, as men and women often do not agree which system is best for them. Since a system may be sustainable for some but not for others, it is not easy to ensure that conflicting views are heard and reconciled, with final agreement reached on a sustainable choice.

And finally, technologies need to be

Continued on page 12

HOUSEHOLD WATER SECURITY: LESSONS LEARNED

Mobilizing Madagascar households to disinfect their drinking water

by Gilbert Nkusi, WES Officer, UNICEF Madagascar

Despite abundant rainfall, only 27% of Madagascar's population has access to clean water. Frequent cyclones and flooding increase the vulnerability to diarrhoeal disease, one of the three leading causes of sickness and death among Malagasy children under five.

From March 1999 to June 2001, cholera epidemics swept through the country, affecting 35,000 people and causing 2,300 deaths. In October 1999, the US Centers for Disease Control and Prevention (CDC) joined forces with CARE and with Population Services International (PSI) to develop a safe water system for the capital, Antananarivo, based on three components:

- Development of a sodium hypochlorite solution for use by households
- Provision to households of safe water storage containers



Safe water in the home improves the quality of life

- Hygiene education through community mobilization and social marketing.

The result was Sûr'Eau, a solution of 0.4% sodium hypochlorite marketed in a 500 ml bottle. A Malagasy family – six people on average – can produce safe drinking water for a month from one bottle, using a 5 ml capful per 20 litres of water.

After successful testing in the capital, UNICEF, the US Agency for International Development and other partners provided substantial funding to PSI to scale up the manufacture of Sûr'Eau for wholesaling nationwide, while additional funding was provided to various non-governmental organizations (NGOs) to link up with the wholesalers to promote Sûr'Eau within communities. The NGOs involved include CARE, Action Santé Organisation Secours, John Snow, Inc., and Catholic Relief Services. By the end of December 2002, over a million bottles of Sûr'Eau had been distributed to communities throughout Madagascar, reaching even the most remote villages for potential treatment of 2.2 billion cubic metres of drinking water.

Use of Sûr'Eau has been found to be significantly higher in areas where community development activities are under way, which indicates the importance of hygiene education and community mobilization to encourage households to treat their drinking water. The incidence of water-borne diseases decreases markedly when household water disinfection is coupled with other hygiene measures, especially handwashing at critical times with soap or ash, transporting and storing water safely, and

safe disposal of excreta. Promoting Sûr'Eau to Madagascar's communities has become an important component of UNICEF's national programme for child health, nutrition, and integrated childhood development.

Sûr'Eau is fully adapted for easy use in the home, unlike other methods of disinfection which are more specialized, expensive and time-consuming, such as cleaning and chlorinating wells. To keep the price within the ability of villagers to pay, Sûr'Eau costs 2,000 Malagasy francs (34 cents) per month. But since the sales are not yet covering the production costs, the financial partners including UNICEF are continuing to subsidize the promotional phase. The price is of course minimal when compared with the cost of periodically and systematically disinfecting water distribution networks, wells and boreholes – a cost which Madagascar's rural communities could not possibly afford to pay.

Enlisting community entrepreneurs to promote Sûr'Eau

A pilot project was initiated in August 2001 in a remote rural area to the east where villagers have virtually no access to the commercial infrastructure and communications media, not even radio, that are usually fundamental to the social marketing approach.

The following methods were used for implementation:

- Liaison with the commune and *fokontany* authorities (the *fokontany* districts that make up a commune each comprise a cluster of villages totalling some 8,000 to 10,000 people)

- Formative research in the target communities
- Selection of community-based sales agents – village entrepreneurs who promote and sell the safe water components in their *fokontany*
- Training of the community sales agents on diarrhoeal diseases, the use of Sûr'Eau for preventing diarrhoea, and techniques for motivational interviewing and sales
- Launch of Sûr'Eau in the villages by the community sales agents, supported by NGOs
- Monitoring of the community sales agents by the commune and *fokontany* authorities and by NGO staff.

At the end of 2002, when the project had been going for over a year, progress was evaluated by CDC and CARE to assess the communities' knowledge and use of Sûr'Eau, and its impact on the incidence of diarrhoeal disease. The evaluators summed up their findings as consistently positive.

"The self-reported use of Sûr'Eau in this rural population was the highest of any safe water system project to date. Observed utilization rates, as determined by the presence of total or free chlorine residuals in stored water measured during surprise visits, ... were similarly high, ranging from 43% to 75%. Observed utilization rates in previous field trials, where the safe water

The introduction of Sûr'Eau in Madagascar has revolutionized water treatment, creating awareness among the population that most locally available water is unsafe and that households can disinfect their drinking water at little cost.


system components were given away for free, ranged from 19% (Bolivia) to 73% (Uzbekistan). The overall rate of use of Sûr'Eau did not vary by socio-economic status, as estimated by rice consumption or literacy of the female head of the household. This finding suggests that even the poorest of rural families can afford the disinfectant solution and are placing a high priority on safe water...

"The high rate of Sûr'Eau utilization suggests that many households recognize the need to treat unboiled drinking water and that Sûr'Eau is the treatment method of choice...

"The high rates of use of Sûr'Eau suggest that the rural community mobilization approach, which largely depends on community-based sales agents, was successful in educating this rural population about the product and motivating them to use it. The overwhelming majority of survey respondents had heard of Sûr'Eau, and there was a high degree of recognition that the purpose of Sûr'Eau was to prevent

diarrhoea... The high rate of adoption of Sûr'Eau suggests that the community-based sales agent can be a highly effective behaviour change agent. In light of the nearly universal lack of access to mass media, such as radio, in these villages, the village-based sales agent offers a mechanism for implementing the safe water system in a rapid and effective way in remote regions."

In order to increase sustainability and scale up nationwide distribution, production of Sûr'Eau has been transferred to a local enterprise, Société de Fabrication de l'Océan Indien, with the intention of privatizing and strengthening the distribution network through decentralized community structures such as local associations, local sanitation services and religious institutions. The medium-term goal is to reach 10% of the population of Madagascar. Current production capacity, at 300,000 bottles a month, is sufficient to meet this goal.

The introduction of Sûr'Eau in Madagascar has revolutionized water treatment, creating awareness among the population that most locally available water is unsafe and that households can disinfect their drinking water at little cost. The use of Sûr'Eau has also significantly reduced the risk of cholera epidemics, particularly in the provinces most prone to cyclones and flooding. 

Demand-response Mozambique, from page 10

seen within a broader developmental context. Some worry that villages choosing a protected well are getting a 'lower' level of service than other, better-off communities. This can be seen as immoral and discriminatory. Yet if we commit to working with communities over time, this view may change. Current support from a WaterAid partner does not have to be considered definitive, since sustainable development processes are usually incremental over time. It should be accepted that different communities are at different stages

of development and that not all have the ability to make a giant developmental leap. If we accept this premise, then we should also commit to long-term partnerships with these communities. Communities that start out by choosing to improve their traditional water source – a protected well, for example – should be encouraged to request support for project upgrades over time as their economic, social, technical and political capacities increase.

The stifling of technology choice only undermines sustainability, as is

evident from years of supply-driven programmes throughout the developing world. The demand-responsive approach enhances the sustainability prospects for poor communities and carries the potential to eliminate the influence of decision makers biased towards one type of system. The marginalizing of 'experts' will of course always be resisted by the said 'experts', but the work of WaterAid's partners in Niassa suggests that letting communities decide which option is best for them places real control in the community, where it belongs.

HOUSEHOLD WATER SECURITY: LESSONS LEARNED

Monitoring water quality in ten Uganda towns

by Guy Howard¹, Paul Luyima² and Robert Odongo³

During the past decade the guidelines for drinking-water quality issued by the World Health Organization have consistently advocated independent surveillance of water supplies by health authorities (WHO 1993). Such surveillance entails monitoring and evaluating water supplies for their risks to public health, as well as investigating the conditions in order to identify actions that would ensure safer water.

If surveillance programmes are to pinpoint water-related health risks effectively, they must take into account the range of factors that may affect water-related disease. WHO has identified the following quantitative service indicators for assessing the adequacy of water supplies in terms of their potential impact on health (WHO 1997):

- Water quality and sanitary integrity of the supply
- Continuity of supply, expressed as the hours per day that water is available
- Access to water supply, which may be converted into a 'coverage' estimate
- Cost of water at the point of purchase
- Quantity of water available, best determined by service level (Howard and Bartram 2003).

In addition, for piped water supplies, particularly in urban areas, qualitative measures of leakage are important for understanding the factors that may lead to contamination.

In the urban areas of developing countries, only a few surveillance programmes exist that cover the entire town or city and also take fully into account the variety of communities, socio-economic conditions and the range of water

In the urban areas of developing countries, only a few surveillance programmes exist that cover the entire town or city and also take fully into account the variety of communities, socio-economic conditions and the range of water sources used by low-income communities.

sources used by low-income communities. When monitoring programmes have been set up, they have tended to focus solely on the piped water supply or cover only some urban neighbourhoods. Furthermore, little account has been taken of the importance of poverty in determining access to water supplies and vulnerability to disease.

A pilot project was undertaken in ten Ugandan towns between 1997 and 2000, funded by the UK Department for International Development (DFID) and WHO, to develop and test appropriate methodologies for water surveillance in urban areas of developing countries. This included developing and testing a range of tools for collecting data on the various service indicators identified by WHO. The project also developed a methodology for zoning urban areas that allows vulnerable groups to be identified and prioritized, both for collecting data on them and for developing interventions to improve their water supplies. A key objective was to ensure that all sources of water in use are taken into account, which includes water stored within the household. The data obtained were then used to develop appropriate interventions for safer water both at the source and within the household. Two manuals were produced which are available from WEDC (see references).

The project was managed from the centre by the Environmental Health Division of the Ministry of Health. The fieldwork was implemented by the ten municipal public health departments, with their health inspectors and health assistants carrying out most of the activities.

Collecting data

The project activities started out in Kampala, the capital, before expanding to eventually include nine other major towns across the country. In each town, inventories were taken of all the water sources available to townspeople lacking a household connection to the piped water supply. This also provided an opportunity to collect data on costs, continuity and management arrangements. Typically, the sources available included water points (usually protected springs, but also boreholes with handpumps), public taps, water sold by households with a connection, and surface water.

Initial assessments were then made of the quality of the water both at source and in the household. The water quality was tested with portable on-site testing kits using membrane filtration to quantify microbial contamination. The towns were then zoned using a methodology that reflected socio-economic status, population density and water supply arrangements. These data were then used to plan and implement programmes for routine surveillance of piped water, alternative sources and household water. In order to refine understanding of the importance of different water sources to low-income neighbourhoods, detailed studies of water usage in poor neighbourhoods were undertaken in three towns. This provided comprehensive information on the use of different sources and further data on costs and continuity.

Improvements spurred by the surveillance

A key objective was to identify appropriate measures that would reduce the risks to users' health. Various initiatives were developed to improve water supplies, and both the Ministry of Health and the municipal public health departments played important roles in advocating improvements. Two particular interventions are described below.

Choice of water source and hygiene behaviours

Data obtained from the surveillance programme were used to demonstrate to communities which sources provided their safest water for drinking. In the town of Soroti, for example, testing of the water from the piped system, boreholes and protected springs showed that the boreholes provided by far the best water for drinking. The local environmental health staff used these findings to promote borehole water for drinking as part of their hygiene education activities. A follow-up study of water usage showed the approach had worked: the boreholes had become the preferred choice for obtaining drinking water.

In several towns the surveillance data were used to deliver hygiene education messages on maintaining water quality during collection, transport and storage in the home. An important strategy was involving the communities in the reading of the results of the water quality tests, as an entry point for a dialogue on how water quality is best maintained. The strategy brought results: the levels of contamination in household storage containers decreased over the period of the project.

The use of an on-site testing kit that allows levels of contamination to be quantified was critical to the strategies for improving the choice of water source as well as hygiene behaviours. It enabled communities to see for themselves that their own actions were significantly reducing contamination levels. This is important for motivating communities to sustain and intensify their new hygiene habits, a result far

harder to achieve with simple bacteria presence/absence tests that do not differentiate between low and heavy contamination levels and consequently cannot show the incremental improvements over time.

Improvement of alternative water sources

A major finding was the fact that alternative sources of water are widely used and valued by low-income communities. In several of the towns the use of 'protected' springs significantly increased the risks to health because the water was heavily contaminated. The poor communities of Kampala consistently voiced the desire to see their alternative water sources reprotected and improved. A key factor influencing their thinking is the scarcity of public taps in Kampala and hence the greater distances to be trudged to fetch water from them. Other factors also influence the preference for other sources; the relatively high cost of the water from the taps becomes prohibitive during periods of financial hardship, and the taps are prone to run dry.

From combining the water quality data and the sanitary inspection data it became clear that the microbial contamination of protected springs results from poor maintenance of the protection works at the spring capping. Pit latrines and similar sources of faeces contribute little to the contamination, but the absence of sanitation facilities is a significant contributing factor, since faecal material is improperly disposed of and gets washed into the springs.

An improved design was developed for protected springs. The original design had used simple retaining walls of smooth clay or similar material laid over a thick inner hardcore of backfill rubble, with channels cut through the walls for water overflow onto the apron. Plastic sheeting, which rapidly deteriorated, had been used to line the coarse rubble to prevent water seeping through (Howard et al. 2001). The improved design places a box around the spring and uses finer-grained backfill for the hardcore, overlaid by several protective

layers of natural materials including murrum and clay. The works are further protected by constructing improved drainage around the spring, lined with stone to prevent collapse, and an extra surround of retaining walls to protect the backfilled area. The work of reprotecting five springs was undertaken in collaboration with Save the Children Fund; bacterial concentrations were found to have dwindled fourfold to ninefold.

As a key component of improving alternative water sources, the relevant personnel were trained in maintenance techniques and in simple methods for assessing health risks. The training was geared towards practical actions, and accords with the approach to planning water safety that forms the basis of the revised WHO guidelines for drinking-water quality to be published this year.

Conclusion

The Uganda project showed that effective surveillance programmes can be implemented in the towns and cities of the developing world and can be used to develop appropriate interventions. It is essential to target activities on the city's poor communities, and data on a range of variables are required in order to assess health risks. The findings from the project also emphasize the need to consult with communities and consider whether alternative water sources can be improved.

References

- G. Howard and J. Bartram (2003) *Domestic water quantity, service level and health*, WHO, Geneva.
- G. Howard, R. Mutabazi and M. Nalubega (2001) 'Rehabilitation of protected springs in Kampala, Uganda' in J. Pickford (ed.), *Water, sanitation and hygiene: Challenges of the millennium. Proceedings of the 26th WEDC Conference*, Water, Engineering and Development Centre, Loughborough University, UK.
- WHO (1993) *Guidelines for drinking-water quality. Volume 1: Recommendations*, second edition, WHO, Geneva.

continued on page 26

Sanitation, Hygiene and Water Quality in Schools and in the Community, Uzbekistan

Dr. Pandit B.A, Consultant – WES UNICEF Uzbekistan

Lack of sanitation is a significant factor adversely affecting quality of life in rural areas. The worst sufferers are the most vulnerable in society, especially women and children in poor and marginalised communities. It is demonstrated that increased access to proper sanitation facilities along with the adoption of adequate hygienic practices could significantly reduce the disease burden on the rural economy. These actions could also prevent further water related disease as well as reduce the financial loss incurred by rural families due to direct and indirect expenditures related to disease occurrence.

Lack of access to safe drinking water and improper disposal of human excreta and solid and liquid wastes lead to unfavorable environmental conditions; and these conditions combined with lack of proper hygienic practices have been major causes of life-threatening disease in Uzbekistan.

Introduction of Hygienic Toilets in Schools and in Selected Communities

The average number of students in a school in Uzbekistan in rural areas is approximately 700-800, and both boys and girls use the same pit toilets. At times the condition of these toilets are so unsanitary that students refuse to use them, and opt to use open fields to urinate and defecate in. Girls suffer the worst from these unsanitary conditions.

To address this issue, the UNICEF Uzbekistan Country Office has launched the “Water Sanitation and Hygiene Project” in the three districts of Karakalpakstan (Khodzjili, Chimbay and Kanlikul) and two districts of Khorezm (Urgench and Khiva), to be implemented through schools and in communities. The “Total Sanitation Campaign” is a comprehensive project for the worst

affected areas of the Aral Sea basin. Because the underground drainage system is costly and water is scarce in most parts of Uzbekistan, the twin pit pour flush water seal toilets were chosen to replace simple pit toilets in schools - fifty in the Republic of Karakalpakstan and thirty in the Khorezm district. These hygienic toilets have been highly appreciated by the Local Center of State Sanitary Epidemiological Surveillance and by local authorities.



UNICEF is training local masons in the construction of sanitary toilets

Households have also been motivated with the help of a local NGO “Soglom Avlod Uchhun” to replace their simple pit toilets with the low cost pan and trap, along with squatting plate type of toilets. These toilets are now being locally manufactured and UNICEF is encouraging manufacturers to be self-sufficient. To date, the response has been positive, and in the first three months about 500 households were ready to replace their simple pit toilets. A manual has been developed with the help of Soglom Avlod Uchhun about the hygienic toilets, and has been distributed throughout the community.

Hygiene education in Schools and Community

Hygiene education started with training sessions, though a one day training for



A fitted pan hygienic toilet



Photo 3: Construction of hygienic toilet

school directors and a three day training for school teachers in five districts. One director and two teachers from each of the 80 selected schools were trained in hygiene education in the cities of Nukus and Urgench.

Hygiene education, with the development of educational materials was also implemented with the help of the Republican Center of Education:

- Four workbooks for grades one to four were developed on hygiene education and these are being distributed among students in grades one to four.
- Flash cards on seven components (safe disposal of drinking water, safe disposal of waste water, safe disposal of human excreta, garbage disposal including animal excreta, home

sanitation and food hygiene, personal hygiene and community sanitation) along with pictures were developed and distributed among the schools.

- Schools have been provided with hygiene kits.
- Signboards showing all the components have been developed and distributed among the schools.
- Peer groups from among senior students have been trained in hygiene education in all seven components.
- A parent–teacher association in schools has been formed.

Young school children often have a difficult position in the family as elders are not typically receptive to the new ideas brought home by youngsters. Thus, not all the information given to the special groups formed in the schools may be accepted correctly by families, and as a result dissemination projects may not produce the expected results. To address this, community members were also made aware of hygiene education. UNICEF with the help of Soglom Avlod Uchhun, organized orientation of the community on hygiene education and motivated the community to replace their simple pit toilets with hygienic toilets. The impact of the orientation was so positive that the community themselves started looking after their surroundings. Previously, communities had very few pits for garbage disposal and socket pits for disposal of waste water, and after this intervention, every community member in the Khodjili district around school number one had dug the pits for garbage and waste water disposal. Hygiene education messages have had a positive impact on local beliefs and values.

Introduction of H2S strips for Water Quality Tests

Water in sufficient quantities and of good quality is essential for life. However, the quality of water from improved supply systems is often



Community members spreading hygiene education messages in homes

compromised by unreliable operation and lack of maintenance. Water is also often exposed to secondary contamination during collection, transport and storage. Inadequate means of access to good quality drinking water leads to a high risk of water-borne diseases such as diarrhoea, cholera, typhoid, hepatitis A, amoebic and bacillary dysentery and other diseases.

Thus, not all the information given to the special groups formed in the schools may be accepted correctly by families, and as a result dissemination projects may not produce the expected results.

The Khorezm region and the Republic of Karakalpakstan are located in declared ecological disaster zones. The health indices of this Aral Sea region differ from the indices of other regions, and the quality of drinking water does not meet the national standards of bacteriological contamination. In the Khodjili area, where UNICEF has sponsored a project on community mobilization for promoting hygiene practices, 31.3 to 36.5% of the water tests completed deviate from national standards, in terms of microbiological indices. Although there has been an improvement in water quality in some areas, a wide fluctuation is seen in different areas. Overall, 37 to 56% of water quality tests fail national standards.

The community which should be the actual beneficiary of the water supply



Hygiene messages being disseminated.

project is not always aware of the extent of contamination at point-of-source in the household, and as such there are numerous examples of bacteriological contamination of water collected from safe water sources being contaminated in homes due to improper collection, storage and handling practices. UNICEF in association with the Centre of State Sanitary Epidemiological Surveillance of the Republic of Uzbekistan through its district level centres has conducted water quality monitoring that includes bacteriological tests.

A cost effective option for bacteriological tests are now available which does not require a laboratory, costing around one-third of the current cost per test. The H2S strips developed for this purpose are being used in other countries in Asia, such as India. These can be used very easily by the community to monitor their own water, both at the source and at home. The water needs to be further examined by a laboratory to find out the magnitude of contamination and the type of pathogen. This is where the role of The Center of State Sanitary Epidemiological Surveillance becomes very crucial as they will be able to carry out further investigation. UNICEF has sponsored a community mobilization project, through Soglom Avlod Uchhun, in the two districts of Khodjili and Khiva, where a hundred volunteers have been trained in improved hygiene practices that include safe handling of drinking water and monitoring the quality of drinking water by doing the H2S test.

continued on page 26

The challenge of teaching hygiene in two Laos villages –

by Waldemar Pickardt, WES section chief, UNICEF Vientiane

When a blackboard is not enough

Gang is a seven-year-old Laotian schoolgirl of Ban Nam Gon Neua village, Kham district, Xieng Khouang province. She knows what you should do before eating and after going to the toilet. “If you don’t wash your hands you will get diarrhoea and a stomach ache,” she explains.

Gang has learned this from Yuwa, her teacher in the village school; he teaches hygiene to all the village children in grades one to four. Hygiene is well understood in the village.

But there is a problem: the school, like the rest of the village, lacks proper sanitation facilities. Yuwa can stand at the blackboard and teach the importance of keeping latrines clean, washing hands with soap, all the measures for maintaining hygiene – but there are no latrines, no sinks, no water supply.

“When we need to go to the toilet, we go in the bushes,” says Gang.

Yuwa has all his pupils bring two bottles of water to school each day, one for washing their hands and the other of boiled water for them to drink during the day.

He teaches all his students about hygiene as a key issue for their environment and health, but the situation is far from satisfactory. “It is difficult because the children can’t put into practice what



Fetching the household’s water in a Laos village

I teach them,” says Yuwa. “Without any sanitation facilities, I can’t actually show them what they should be doing.”

Yuwa says he makes sure that the children wash their hands while they are at school, but obviously he cannot enforce the rule at other times. “I think they wash their hands at home but I can’t be sure,” he admits.

Despite Yuwa’s efforts, diarrhoea remains a serious issue for the village’s 78 families. “The worst outbreaks occur at the end of the rainy season,” he says. “Every year, one or two of our children will die.”

Old habits can be hard to break

Diarrhoea is a problem in the village, reports Phone, a young woman of 20 speaking of her village in Khun district, Xieng Khouang province. “We don’t have proper toilets here, so we have to go in the surrounding bushes.”

Through the efforts of UNICEF and other agencies, Phone and others like her been trained on hygiene and hygiene-related diseases. Since her training she has been passing on her knowledge to her fellow villagers.

Phone says that hygiene behaviour has improved. “The children here used

to die from diarrhoea. But over the last two years people have been told why this can happen, and there have not been any more deaths. Even so, people are still getting diarrhoea.”

“I think that most people are now washing their hands after going to the toilet. But we need proper toilets, which won’t attract flies to spread diarrhoea,” she says.

Phone says that while she knows how to protect people from diarrhoea, the challenge is convincing the villagers to give up ingrained habits they have practised their whole life. “It’s easy for some people to change, but difficult for others – they don’t always believe what I’m telling them. People sometimes say that my advice is only words, with nothing to back them up.”

The villagers who never went to school are the hardest to persuade. “They are often worried only about their work – they can’t see the importance of hygiene,” says Phone.

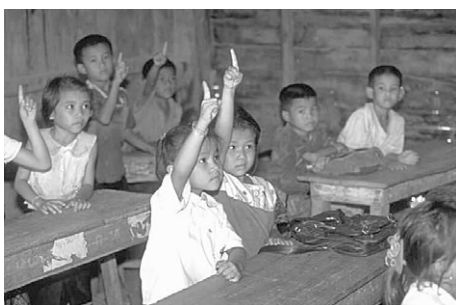
But she is clearly proud to be doing something for her village, despite the difficulties: “I’ve been given practical training which is useful for all the villagers here.”

I fail to see how we move forward without some hard questions about our past support that at the very least informs our future work.

*Ned Breslin, e-conference
October 2002*

I think there is no doubt that water, as the fundamental necessity for life, must be considered a human right. I think it follows from this, that privatization of water resources is not ethically acceptable.

*Kathryn Kelly, e-conference
October 2002*



Learning hygiene in the village school

Towards child-friendly latrines in Viet Nam

by Julie Banzet, Intern, UNICEF Viet Nam, with thanks to the primary school children who advised on the research

Designing latrines and toilets to be attractive to young children safeguards their health and encourages them to adopt sound hygiene habits from an early age. They can also become agents of change, by introducing new hygiene behaviours to their family and community.

UNICEF has helped to incorporate hygiene education into the Viet Nam school curriculum and has assisted in installing water supply and sanitation for over 3,400 primary schools and 800 kindergartens and day-care centres around the country. While the standard latrine designs have undoubtedly fostered better hygiene, a child-friendly approach, guided by children, generates designs more likely to suit children's sizes and preferences.

The value of child-friendly latrine design is being recognized in a number of countries, notably India, where non-governmental organizations have developed child-friendly community toilets for city slums. These toilets, built next to the adults' community toilets, are safe, attractive and pleasant for children. They solve the problem of long queues that motivate children to give up waiting and defecate in the open. Child-friendly toilets also feature in the school sanitation and hygiene education programme in Bangladesh, where UNICEF is promoting an affordable double-vault pit latrine which is pleasant and easy for children to use.

The design points that follow summarize suggestions made largely by Vietnamese children in grades three to five.

A child-friendly latrine is...

Safe to reach...

- If there are stairs, the steps should be low, with a sturdy banister
- Drainage should be good and the surface smooth, no puddles of stagnant water

- The pathway to the latrine should be clear, no vegetation or other obstacles

Well lit and ventilated...

- Window openings in the walls, with mesh screens to keep out flies
- Electric light in the latrine if possible, installed to prevent hazards from the water nearby

Pleasant and safe to use...

- The footrest low and wide for children's safety, stability and comfort
- The hole small to eliminate younger children's fear of falling in
- A grip bar on the wall for children to hold on to
- The seat small if there is a seat, and placed low for children or with a small step in front of it for easier access
- A roof if possible, to keep out the rain
- Colourful murals, which can be done at low cost by the children and their art teachers
- A receptacle for discarding used toilet paper

In the right place...

- Discreetly sited, for the users' privacy and the general aesthetic
- Accessibly sited
- Sited near the water point, for handwashing and for swabbing the latrine

Clean and well maintained.

- Enough water for regular cleaning
- Taps or buckets for flushing, placed near the urinals and latrines
- Regular slope and smooth cement finish for efficient floor drainage



Ladder of increasing child participation.

- A motivated, organized team of children and adults for maintenance.

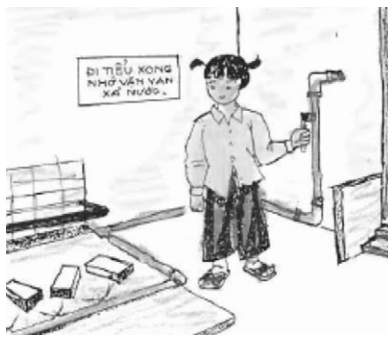
Consulting the children

The Convention on the Rights of the Child promotes children's right to express themselves and participate fully in all undertakings that concern them. Their opinion is especially valuable for adults designing latrines to be attractive to children.

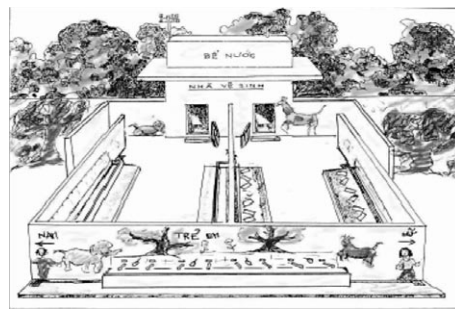
Accordingly, simple workshops were organized in three primary schools of Cao Loc and Loc Binh districts, Lang Son province. The adults acted as facilitators and initiated the activities but did not influence the children's opinions.

At the start of each workshop ten children – girls and boys from grades three to five – drew a happy face and a sad face on a sheet of paper. They gained confidence and relaxed during this creative activity.

They then wrote down what they saw as the good points of their school



Child-friendly latrine cubicle for primary schools.



General layout for a child-friendly latrine in a primary school with over 100 pupils.



Child-friendly latrines.

latrine under the happy face and the bad points under the sad face. They discussed their views in groups of five and agreed on the three principal good and bad points.

After this they considered solutions to the problems and the role that they could play to improve conditions.

Finally, child-friendly designs were presented to them to obtain their comments and suggestions.

The workshops concluded with a summary of what was to be done, how and by whom, with candies handed out at the end.

The children became very involved, offering ideas that were interesting, relevant, clear and realistic. The workshops included a similar session with parents and teachers, likewise positive and productive. Working in small groups allowed everyone to participate and express opinions. For the wrap-up the children's recommendations were presented to the adults for the whole

group to agree on what needed doing.

To sum up the approach, children are not just the beneficiaries who justify our actions in providing sanitation. They must become real partners and be fully involved with hygiene promotion in their school, their home, and their community. To quote one little girl in Cao Loc primary school, "If you ask our opinion, you have to consider it and then make changes." 🌍



Children assessing the latrine at Mau Son primary school.

The children's suggestions

Some pointers for making any latrine child-friendly, whether at school or at home:

- Paint it!
- Plant flowers and trees around!
- Build a door or a wall to ensure privacy!
- Add a step to make a sit-down toilet safer for littler children!
- Clean it!
- Repair the floor with a little cement so that water and urine don't puddle and smell!
- Buy a new bucket to carry water for flushing!

For further information and designs of child-friendly latrines from Viet Nam, e-mail cbadloe@unicef.org.

Basic needs in Sri Lanka, from page 8

one, to alleviating poverty. In some locations home gardening is being practised on a small scale, generating produce for sale as well as helping to safeguard the family's food security.

Policy and institutional arrangements

The rapid development of roof harvesting over the past seven years, and the energetic commitment of various NGOs, have influenced policy makers to assign a prominent role to rainwater

harvesting, including roof harvesting, in Sri Lanka's current national policy, planning and budgetary allocations for rural water supply. Following the lead set by the National Water Supply and Drainage Board, a number of provincial and district government authorities have taken up the approach.

One NGO in particular, the Lanka Rainwater Harvesting Forum, pioneered roof harvesting in Sri Lanka and carries much of the credit for developing and popularizing the technology, having

conducted most of the research, training and skills development that have generated the various low-cost designs for rainwater collection and storage systems. Other NGOs both large and small have also contributed appreciably.

Further details on the research and development of rainwater harvesting in Sri Lanka could be obtained from www.rainwaterharvesting.com. 🌍

Safeguarding water quality in rural Guinea

by Baldé Mamadou Mouctar, Project Officer Water – Hygiene – Sanitation – Unicef – Guinée Conakry

Situated on the west coast of Africa, Guinea is home to some 7.4 million people and host since 1990 to nearly a million refugees from Liberia and Sierra Leone. As the result of more recent troubles along the borders in 2001, close to a quarter of a million people, chiefly women and children, fled their homes to take refuge in other parts of the country.

The national programme for rural water and sanitation supported by UNICEF focuses on developing services for about 1.5 million people in some 213,000 households in rural areas of Middle Guinea and Upper Guinea. Collaborative partnerships are the hallmark of the programme, starting from the national steering committee that coordinates the seven ministries involved and reaching outwards to the communities and families. Key activities are maintaining handpump function, ensuring water quality, fostering hygiene education in schools, promoting hygienic latrines and working towards behaviour change.

Our article in *WATERfront 15* reported on progress with sanitation between 1997 and 2001. This article reviews the work on water quality undertaken during the same period in the same areas.

To supplement the Ministry of Health's regular monitoring of drinking water standards, the University of Guinea's Centre for Environmental Studies and Research (Centre d'études et de recherche en environnement or CERE) conducted two studies started in 1998 and completed in 1999.

For the technical survey, water samples were collected from 232 water points fitted with handpumps and from 696 households fetching their water from these points. The samples were analysed for acidity, conductivity, turbidity, bacterial contamination, nitrates and iron content, with the following results:

- All the water samples were acidic (pH below 7).
 - The water from boreholes more than 15 years old tended to be turbid and cloudy.
 - Nitrate levels were high only in refugee camps that have since been closed along the borders with Liberia and Sierra Leone.
 - Iron content was too high at a number of water points, which made the water inconvenient for drinking, cooking and washing clothes.
 - Bacterial contamination levels were high both at water points and in households. Coliform bacteria showed up in nearly half of the samples (48%) from water points, and about 60% of the household water samples contained more than 100 coliforms per 100 ml. Bacteria densities frequently increased during the process of fetching water from source to household.
- A knowledge, attitudes and practices survey was carried out at the same time in the same areas to identify the connections between water quality and the users' knowledge.
- After study and discussion of the findings from the two surveys, the national steering committee decided on the following remedial measures:
- A thorough inventory was made of all water points to identify every problem such as turbidity, excessive iron or no pump. Technical data sheets were developed to enable community members to be fully involved in the inventory process.
 - Training was organized in techniques for chlorinating drinking water with chloral hydrate for 80 pump mechanics, 75 health centre workers and 20 staff members of the national agency for servicing water points – Service national d'aménagement des points d'eau or SNAPE.
 - SNAPE personnel used compressed air from a submerged pump to flush out cloudy water from more than 100 boreholes.
 - Community members joined forces with technical personnel to rehabilitate 56 wells yielding water during the dry season. The wells were drained, cleaned out, disinfected and fitted with handpumps.
 - Deferrizers for aerating and filtering excessive iron were constructed and installed on more than 80 water points (see diagram).
 - All boreholes and wells with a handpump – some 3,000 altogether – were systematically disinfected with calcium hypochlorite.
 - Information on the importance of hygiene around water points, and on the causes and prevention of water contamination, was disseminated by rural and community radio stations and by direct personal contact. The messages targeted chiefly women and children, who are usually responsible in these areas for fetching the household's water.
- A follow-up study conducted at the end of 2000 assessed the effectiveness of these interventions, reviewing the situation at half of the water sources studied earlier. The key findings:
- In three boreholes selected for detailed analysis, the deferrizers had filtered out 88% and 96% of the iron. Unfortunately the overall number of water points with excessive iron had increased, a phenomenon due to be investigated later on by a student from CERE.

Continued on page 26

Continuing crisis in southern Africa: New UN appeal

by Mark Henderson, WES section, UNICEF New York

For the second year running, an inter-agency appeal has been launched for southern Africa. The new Consolidated Appeal Process (CAP) for the period July 2003–June 2004 aims to raise \$400 million and again covers six countries: Lesotho, Malawi, Mozambique, Swaziland, Zambia and Zimbabwe.

In 2002, conditions in the region placed about 14 million people (more than half of them children) on the edge of survival, with food shortages not seen since the drought of 1992. Two out of three of the region's inhabitants live below the poverty line. HIV prevalence rates range from 16% in Malawi to 34% in Zimbabwe.

While the humanitarian response in 2002–2003 successfully averted large-scale deaths from starvation, the new CAP is recognition that too little progress has been made; 6 million people continue to need urgent assistance in order to survive and cope with the risks they face. The humanitarian community has come to agreement that food insecurity in southern Africa is only one symptom of a crisis exacerbated by the HIV/AIDS pandemic, increasing poverty, and the concomitant breakdown of health and social services. HIV/AIDS is rapidly eroding the coping strategies used by communities to survive and recover from frequent drought and natural disasters.

Most of the first appeal for \$611 million last year was for food delivered through the World Food Programme. Less than 1% was budgeted for water and sanitation, and less than half of that was actually funded, the two largest donors being Canada and Sweden.

Zimbabwe

The consultant recruited by UNICEF in 2002 to review the needs for water and environmental sanitation (WES) – Dr. Peter Wurzel, formerly UNICEF's WES chief in Pakistan and Mozambique – found that Zimba-

In 2002, conditions in the region placed about 14 million people (more than half of them children) on the edge of survival, with food shortages not seen since the drought of 1992.

bwe, despite receiving 80% of mean annual rainfall, was nonetheless experiencing an agricultural drought because of the poor timing of the rains. Moreover, rural water and sanitation services were already in decline and had not recovered from the February 2000 flooding caused by tropical cyclone Eline, which resulted in damaged water supplies and tens of thousands of collapsed latrines. Under the first CAP appeal's modest budget, small-scale WES activities in Zimbabwe focused on drought-prone provinces in the south and west, and on responding to cholera outbreaks.

The current challenges in Zimbabwe are complicated by the deteriorating economy, immense policy constraints, depleted capacity in the health sector and challenges to humanitarian principles; 71% of the new CAP budget is for Zimbabwe alone. This includes a sharp rise in the allocation for water and sanitation, an eightfold increase to \$6.4 million. A hydrological drought is now affecting both the surface and groundwater supplies for households and livestock, and 45% of rural water systems are reported out of action. UNICEF and a number of non-governmental organizations (NGOs) plan to expand their efforts in rural areas with the requested additional funding. In addition, UNDP will keep the city water systems functional in Bulawayo and



The boundaries and names shown do not imply official UN endorsement.

OPSCEN GIS UNIT

Drought-affected countries in Southern Africa, July 2003.

continued on page 22

World Water Day 2003


World Water Day was celebrated on 22 March 2003 in countries around the world, both developing and industrialized, ten years after the first World Water Day in 1993.

The theme this year was 'Water for the future'. Schoolchildren were accordingly a key focus for the United Nations Environment Programme, this year's UN lead agency for the event. In its lead-up to the Day's primary launch at the close of the Third World Water Forum in Kyoto, UNEP noted that many schoolchildren in the developing world, especially girls, are hampered in their learning and development by the lack of safe water and toilet facilities at school.

Schoolchildren warrant special attention for another reason also, as the water managers of the future. UNEP highlighted the global School Sanitation and Hygiene Education (SSHE) programme supported by the IRC and UNICEF, currently up and running in seven countries. The issues are also being tackled in Viet Nam, where hygiene, sanitation and water supply were recently introduced as a new subject in the national curriculum for all primary and lower secondary schools.

The UN Secretary-General's message for World Water Day stressed the urgency of husbanding freshwater resources to forestall the shortages that loom for most of the world. On current

trends, two out of every three people on earth will be suffering water shortages in little more than two decades. Overwhelmingly, the poor in developing countries will suffer the most.

The activities set up for World Water Day elsewhere in the world, whether international, national or local, included public forums and specialist conferences, projects for schoolchildren, exhibitions and fiestas, radio and television features, site visits and such practical activities as marshalling volunteers to clean up polluted beaches in Mexico and Hong Kong and stretches of the river Ganga in India. 

Continuing crisis in southern Africa, from page 19

Harare, by providing water treatment chemicals that are difficult to obtain without foreign currency.

Lesotho and Swaziland

Working out of Harare, Dr. Wurzel provided assessment and planning help for Lesotho and Swaziland since the UNICEF country offices have no WES capacity. In Lesotho an estimated 4,000 households and 40 schools were in urgent need of sanitary facilities, while 2,000 households and 20 schools needed improved water supplies. With the World Health Organization (WHO) as the lead agency for water and sanitation, activities were geared towards improving school environments. In Swaziland, UNICEF supported work to rehabilitate water and sanitation in 6 schools, with plans to extend the work to a further 30 schools. A consortium of NGOs – CANGO or the Co-ordinating Assembly of NGOs – will be playing a larger role this year, chiefly training and advocacy for cholera prevention and treatment, and construction of pit latrines, household water harvesters and protected springs.

Mozambique

UNICEF Mozambique has made a strong case for mitigating the impact of HIV/AIDS by reducing the time and energy to collect water and improving hygiene practices; and on average, 55 of the nation's under-fives die every day from diarrhoea caused by the lack of clean water and sanitation combined with poor hygiene practices. Even so, only 15% of the requested funding was raised last year, and the situation has deteriorated considerably since then because of prolonged drought followed by floods and cholera outbreaks. Over the past nine months, more than 12,000 people have been treated for cholera and more than 100 have died. Surveys show that compared with one year ago, people are further away from their usual water source (7%), consuming less water (13%) and using different sources (11%). This situation may contribute to further increases in hygiene related illness and will increase the likelihood of opportunistic infection in people living with HIV and AIDS. The new CAP proposal envisages WES facilities at schools and health units as well as emergency WES interventions for rapid response to cholera outbreaks.

The humanitarian community has come to agreement that food insecurity in southern Africa is only one symptom of a crisis exacerbated by the HIV/AIDS pandemic, increasing poverty, and the concomitant breakdown of health and social services.

Participatory community education will also be supported, to train mothers, schoolchildren and young people in good sanitation and hygiene practices.

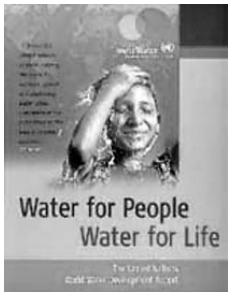
Malawi

In Malawi, the WES response targeted water supplies at nutrition rehabilitation units, where 54 new water points were constructed. Another 453 water points were rehabilitated or constructed, but nationwide the water and sanitation situation has not substantially improved over the last year. The sector is still plagued by a dearth of equipment, spare parts and training for repairing water points, low sanitation coverage, and poor hygiene practices.

continued on page 26

New publications

Water for people, water for life



The World Water Forum in Kyoto in March saw the launch of *Water for people, water for life*, the UN system's comprehensive overview of current water

issues the world over.

A joint compilation by the 23 UN bodies that deal with water, the report takes an in-depth look at every major dimension of water use and management, from the growth of cities to the threat of looming water wars between countries. It includes graphics, charts, country rankings for over 180 nations, and detailed analyses of how different societies are coping with water problems and which policies are working or failing to work. Overall, the report faults political inertia for the world's current failure to protect its water resources from the pressures of population growth, pollution and expected climate change.

Some highlights from the report:

- “Of all the social and natural crises we humans face, the water crisis is the one that lies at the heart of our survival and that of our planet Earth... This crisis touches every facet of life, from the health of children to the ability of nations to secure food for their citizens. Water supplies are falling while the demand is dramatically growing at an unsustainable rate. Over the next 20 years, the average supply of water worldwide per person is expected to drop by a third.”
- The numbers predicted to face water shortages by the middle of this century range from 2 billion people in 48 countries at best, to 7 billion people in 60 countries at worst, depending on factors like population growth and the measures adopted now to ward off disaster.

Climate change will account for an estimated 20% of the increase in global water scarcity, while water quality is expected to worsen with rising pollution levels and water temperatures.

- When nations are ranked for the quality of their water as well as availability, “the poor continue to be the worst affected, with 50% of the population in developing countries exposed to polluted water sources.” Asian rivers are the most polluted in the world, with three times as many bacteria from human waste as the global average. These rivers also contain 20 times more lead than the rivers of industrialized nations.
- Although birth rates are slowing down, continued population growth is a driving factor in the water crisis. “Water consumption has almost doubled in the last 50 years. A child born in the developed world consumes 30 to 50 times the water resources of one in the developing world.”
- The millennium development goals for 2015 include halving the proportion of people without access to safe drinking water and basic sanitation. If the goals are to be met, an estimated 1.5 billion additional people will require improved water supply by 2015 (100 million people per year or 274,000 per day) and an estimated 1.9 billion additional people will require improved sanitation (125 million people per year or 342,000 per day). Current investment will meet the goals or come close in every region except sub-Saharan Africa, says the report. But in absolute terms, the investment needs in Asia outstrip the needs in Africa and Latin America combined.
- “A disturbing fact is that poor people with the most limited access to water supply have to pay significantly more for water.” In Delhi, for example, private vendors charge the

poor nearly \$5 per cubic meter, when families with piped water pay only 1 cent. Vendors in Vientiane charge nearly \$15, compared to municipal tariffs of only 11 cents.

- “Towards 2050, the world could enjoy access to food for all. The fact that 815 million are presently ravaged by chronic undernourishment is not due to a lack of capacity to produce the required food...” In discussing the factors that perpetuate unacceptable levels of poverty, the report notes that treated wastewater could ease the water crisis. Farmers in developing countries already use it for about 10% of irrigated land and could use more. With proper treatment it can actually improve soil fertility.
- “Urban areas lacking water infrastructure are among the world's most life-threatening environments... The poor of these cities are the first victims of sanitation-related disease, flooding and even a rising rate of water-borne disease like malaria, which is now among the main causes of illness and death in many urban areas.” According to a survey of 116 cities, Africa's urban areas are the worst served, with only 18% of households connected to sewers. The connection rate in Asia is just over 40%.
- While the number of geophysical disasters like earthquakes and landslides has remained fairly steady, the scale and number of water-related events – droughts and floods – has more than doubled since 1996.

Water for people, water for life: The United Nations world water development report is issued by the United Nations Educational, Scientific and Cultural Organization. Details and summary are supplied in UNESCO press release 2003–16 of 5 March, available at <http://portal.unesco.org>.

Continued on page 24



Ode

On the prospect of Rupert Talbot retiring

*After so many years as a mainstay
to all of us in the WES field
and to all of the villagers whose lives
he has eased from India to Sri Lanka
to Ethiopia*

So can it be that Rupert Talbot
Really means to chuck it all? But
Surely he must know that we
Have come to need him utterly.

From wan New York to tropic heat
Such luck to have him on our beat
To steer us through the knacks and
norms
For thwarting naughty coliforms.

Take, if you must, a month's
repose
But know we wish you on our toes
So visit long and often, Rupert,
Keep up your input, output,
throughput.

Sustaining the fresh water resource is, without doubt, the greatest challenge ahead of us. We have to come back to this point in our household water security agenda: the major users – and polluters – of fresh water are the farmers, the industrialists and the ever-increasing urban centres.

*Rupert Talbot, e-conference,
October 2002*

New publications, from page 23

Nations' water poverty compared

Also launched in Kyoto was a new international Water Poverty Index, developed by a team of researchers at Britain's Centre for Ecology and Hydrology and experts from the World Water Council.


The Index reviews the water situation in 147 nations across the world. In a departure from standard practice, access to good-quality water is not the sole benchmark for comparison. The Index uses five criteria to rate national performance: resource, access, use, capacity, and environment.

According to Dr. Caroline Sullivan, who led the research team, this explains why a country as rich as the United States ranks only a lowly 33rd overall, while the ten countries rated best overall include two developing nations, Guyana and Suriname. "It is not the amount of water resources available that determine poverty levels in a country," says Sullivan, "but the effectiveness of how you use those resources."

Unsurprisingly, nearly all the nations richest in water are in the northern hemisphere, while nearly all the nations poorest in water are in Africa.

The Index is intended as a practical tool to clarify the links between poverty, social deprivation, environmental integrity, water availability and health. The overarching aim is to help policy makers identify where problems exist and which measures to take to remedy them.

Action is needed on a grand scale, and soon. Experts calculate that in the year 2000, some 20% of the world's population faced water shortages in 30 countries. By the year 2025, that figure is expected to climb to 30%, or 2.3 billion people, in a total of 50 countries.

Detailed information on the international Water Poverty Index is available at www.nwl.ac.uk/research/WPI. 

e-conference excerpts

Does one household's water security compromise the security of other, poorer, households? This is especially important in the context of the demand-responsive approach ... which allows people to choose their levels of service according to ability to pay. To me, it does not satisfactorily deal with the problem of limited resources, where one community's or household's ability to pay for higher levels of service may reduce the resource available to poorer communities or households, now and in the future.

*Jeremy Ockelford, e-conference,
October 2002*

Poor people's 'willingness to pay' for services has in some cases been wilfully misconstrued: where they pay they invariably have no choice, which is a strange way of looking at 'demand'.

*Maggie Black, e-conference,
October 2002*

I fail to see how we move forward without some hard questions about our past support that at the very least informs our future work.

*Ned Breslin, e-conference,
October 2002*

From my experience in working in different developing countries there is still generally a fixation about drinking-water quality above hygiene/sanitation matters. I think this comes from blind faith in the so-called 'scientific' bacteriological indicators.

*John Pinfold, e-conference,
October 2002*

One of the reasons that some water interventions fail in rural communities is underestimating the total water needs of a household.

*Rajindra de S. Ariyabandu,
e-conference, October 2002*

Safe water, from page 1

covered during 351 sessions as well as a Ministerial Declaration. A number of initiatives were also announced by various NGO's, development agencies and international financing agencies.

With a global consensus that water issues are of top priority in pursuing sustainable development commitments, and with safe water now officially enshrined as a human right, the testing ground of our commitment to that right will be the changes we are able to make to daily life in the world's households, especially the hardest to reach – the poorest households of the developing world, whether in the isolated hamlets of remote rural hinterlands, or in the mushrooming shanty towns of the developing world's cities.

Household water security

A key contribution towards the Kyoto discussions was a three-week multinational conference on household water security, conducted by e-mail in October.

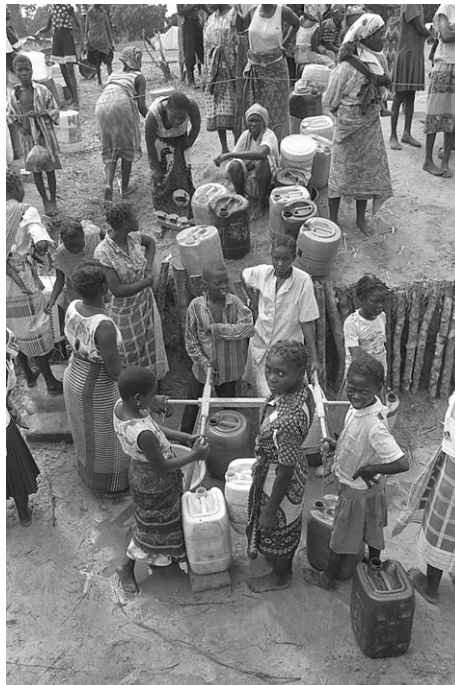
The e-conference sparked energetic debate on both the theory and practice of bringing safe water and sanitation to households still in need. The contributors wrote from a wide range of practical experience in the field, and their expertise on specific topics and technologies also included valuable insights on the implications of water safety as a human right.* The five case studies that head this issue of *WATERfront* represent a sampling from the projects that featured in the e-debate.

If a common thread can be identified that runs through these case stud-

Household water security

The availability to a household of enough water of adequate quality year-round to assure its members' survival, health and productivity, without compromising the integrity of the environmental resource base.

*Maggie Black, e-conference
October 2002*



ies, and indeed through number of the articles that follow them, it is the unwisdom of counting on a single 'perfect' solution to every need, and the wisdom of full-hearted, long-term partnership with the communities we serve – with the occasional warning to water and sanitation 'experts' that these communities may well be wiser than they.

Water for health as a human right

"Water is fundamental for life and health. The human right to water is indispensable for leading a health life in human dignity. It is a prerequisite to the realization of all other human rights."

With those words, a 'General Comment' was adopted in November that expands the definition of the provisions laid down in the International Covenant on Economic, Social and Cultural Rights. The 145 nations that have ratified the Covenant are therefore now under obligation to "respect, protect and fulfil" the right of every individual to safe and secure drinking water and sanitation facilities – equitably and without discrimination.

The General Comment requires countries to work "expeditiously" towards guaranteeing that right to every citizen, by adopting national strategies and plans of action founded on clearly

"By providing clean water and sanitation to the poorest people on the planet, we can reduce poverty and suffering and ensure education for all children"

— Carol Bellamy

defined objectives and time-frames for achievement.

This provides a tool for civil society to hold governments accountable for ensuring equitable access to water. Inadequate water and sanitation are not only primary causes of diseases that have largely disappeared from the industrialized world: they are also a major cause of poverty and the growing disparity between the world's rich and the world's poor.

The General Comment stipulates that water, like health, is an essential element for achieving other human rights, notably the rights to adequate food and nutrition, housing and education similarly recognized as fundamental in the Convention on the Rights of the Child.

Healthy environments for children

Every 45 minutes, unhealthy environments kill the number of children who could fill a jumbo jet.

That grim calculation underlies the new Healthy Environments for Children Initiative, announced in autumn and slated to go into action this year. A global multipartner initiative spearheaded by the World Health Organization, it was launched at the World Summit for Sustainable Development by WHO, UNICEF, the United Nations Human Settlements Programme (UN-Habitat) and the United Nations Environment Programme (UNEP).

WHO estimates that over 4.7 million children under five die each year from ills linked to unhealthy surroundings, or more than two out of five of the young children who each year do not live to see their fifth birthday. And this proportion is on the rise.

continued on page 26


Uzbekistan, from page 16

Upgrading of all existing drinking water resources in all the selected schools in the five districts is being undertaken besides water quality monitoring, and new shallow wells are being constructed along with repairs of the existing ones.

The specific objectives of water monitoring and surveillance are:

1. To improve public awareness of the need for water quality monitoring and bacteriological contamination.
2. To build the capacity of the community in monitoring bacteriological quality of water.
3. To enhance the capacity of the Center of State Sanitary Epidemiological Surveillance and its laboratory units for bacteriological water quality monitoring and surveillance involving the community.
4. To provide public access to information and public participation in the decision making process for drinking water quality
5. To develop a mechanism for spreading the project into wider areas.


Conclusion

Although these projects are in progress, it is hoped that through increased knowledge and capacity building, can Uzbekistanis benefit from safer water and enhanced hygiene practices. The results achieved to date are encouraging, and it is evidenced that participatory approaches, including the involvement of children in schools, with messages being reinforced in their communities, is critical in implementing effective hygienic sanitation. Additionally, involving the community in monitoring water quality with local partners, using cost-effective technology is leading to some very positive results. It is hoped that lessons learned from these activities can contribute to further actions in poor and marginalised communities throughout Uzbekistan. 

Southern Africa, from page 22

The new UN appeal will permit the continued construction and repair of water points and sanitation facilities, including child-friendly designs for schools.

Zambia

UNICEF Zambia responded quickly to last year’s drought by extending safe water supply to 65,000 people through 100 new boreholes and rehabilitation of 165 handpumps. Nearly 1,000 water-point caretakers were also trained in repair and maintenance. Participatory hygiene promotion and sanitation transformation have proved vital in preventing cholera outbreaks. A school feeding project targeting 10,000 children in 30 schools in three southern districts provided a complete package – nutritious pre-class meals; educational materials on water, sanitation and hygiene; HIV/AIDS prevention activities tied to sports and games; and school garden supplies. The plans for this year are further rehabilitation and construction of water facilities together with training. 

Monitoring water quality in Uganda, from page 14

WHO (1997) *Guidelines for drinking-water quality. Volume 3: Surveillance and control of community water supplies*, second edition, WHO, Geneva.

WEDC manuals

G. Howard (ed.) (2002) *Water supply surveillance: A reference manual*, WEDC, Loughborough University, UK.

G. Howard (2002) *Water quality surveillance: A practical guide*, WEDC, Loughborough University, UK.

¹ Programme Manager, Water, Engineering and Development Centre (WEDC), Loughborough University, UK.


² Assistant Commissioner for Health Services, Environmental Health Division, Ministry of Health, Uganda.

³ Senior Health Environmentalist, Environmental Health Division, Ministry of Health, Uganda.

Safe water, from page 26


Unsafe water and poor sanitation head the list of environmental hazards to children, which also include indoor air pollution, insect-transmitted diseases like malaria, and high levels of toxins in the air, soil, water, and food chain.

While everyone is affected, especially in poor communities around the world, young children run the highest risk in proportion to their body weight. Those who survive may grow up physically disabled or mentally impaired – a bleak outlook both for them and their families, and for their nations’ hopes of social and economic development.

With start-up funding set aside by WHO, the work has begun to mobilize partnerships at country level to improve conditions. As WHO’s Director-General said when announcing the Initiative, “healthy environments for children should be the highest social and economic priority of the decade.” 

The full text of the discussions is available on the e-conference webpage (www.unicef.org/programme/wes/econf.htm) and on the webpage of the Kyoto forum on household water security (www.worldwaterforum.org/for/en/fshow.1037).

Guinea water quality, from page 18

- Nearly 70% of the samples from water points were free of bacteria (compared with 52% earlier), and 55% of the household water samples contained fewer than 100 coliforms per 100 ml. All the samples from both sources showed lower densities of bacteria. In a quarter of cases the water quality had remained unchanged during its transfer from source to household and storage in the home – an improvement over the earlier findings which indicates that community knowledge does indeed translate into behaviour change for the better. 

Young people speak out, from page 28

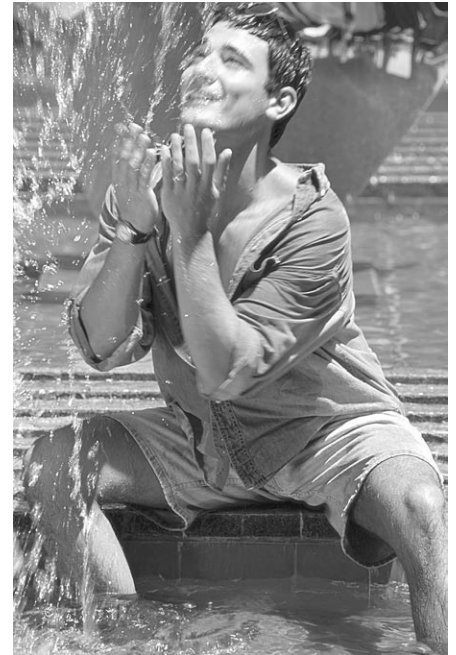
relation to water use and sanitation, as well as provide safe water areas for children and young people's play

- Promote strong environmental child-friendly education on issues related to diversified water use for boys, girls, teachers, parents and community leaders
- Support children and young people's projects and activities relating to water and the environment that affect access to potable water and sanitation.

We as children and young people pledge to:

- Establish action groups, clubs, organizations, and networks of children and young people for activities on water, sanitation and hygiene – locally, nationally and internationally

- Be responsible for peer-to-peer education as young facilitators and child-to-adult education on conservation of water, sanitation and hygiene
- Develop and use child-friendly resource materials and use child peer education methods like drama, poetry, drawing, websites, etc., to create more awareness on environment, water and sanitation issues
- Work with decision makers to promote better water and sanitation facilities at schools in rural and urban areas and in the community so that girls do not drop out of school or face abuse
- Be involved in designing, implementing and evaluating child-managed water and sanitation projects and other initiatives



- Form a Global Children and Young People's Alliance on water, sanitation and hygiene. 🌐

WES on the Web

by Greg Keast, consultant, UNICEF New York

Since March of 2000, information on UNICEF's programmes in the area of water, environment and sanitation has been available on the World Wide Web. The WESWeb site, developed and maintained by the WES Section in New York, forms part of the Programme Division pages on the general UNICEF website.

WESWeb has four main sections:

- **About WES.** This section presents a collection of articles describing UNICEF's work on sanitation, water, the environment and hygiene. The section provides information on a wide variety of programmes, from school sanitation and hygiene education to WES statistics to water quality.
- **Publications.** This section contains full electronic versions, usually in three languages, of all recent publications by the WES Section. Over 50 publications are currently available for downloading. They include titles such as the *Sanitation handbook* from the WES technical guidelines series; UNICEF's WES strategy paper (*UNICEF strategies in water and environmental sanitation, 1995*); the sanitation advocacy booklet (*Sanitation for all: promoting dignity and human rights*); and current and back issues of *WATERfront*.
- **Online services.** This section of WESWeb is a collection of sectoral tools and guides developed to assist WES professionals in navigating and locating online information resources from UNICEF and partner sites. The Guide to Water Quality on the Web can be found in this section, as well as WES bibliographies and a comprehensive listing of WES agencies and websites.
- **Newsline.** This fourth and final section is a venue for WES news and

updates. Current Newsline items include newsbriefs on WES activities and issues around the world, and notes of recent and upcoming conferences such as the Earth Summit scheduled this year to focus on drinking water.

Like the Web itself, the WESWeb site is constantly being modified and updated. Planned additions to the site include a new online database of WES case studies from around the world, and new articles and guidance on WES activities in the context of UNICEF's new medium-term strategic plan.

WESWeb can be accessed directly at www.unicef.org/programme/wes/ or via the UNICEF in Action programmes site from the main UNICEF website. Comments and contributions from UNICEF field staff and partners are always welcome: please contact mali@unicef.org or gkeast@ica.net for more information.

Young people speak out in Kyoto

Child delegates from 32 countries formed a Children's Forum at the Third World Water Forum, issuing a manifesto for their generation after the meeting had concluded. Young people around the world are continuing the discussion on UNICEF's interactive *Voices of Youth* website.

"I had assumed that grown-ups are better informed than us children. I now think we have similar ideas, only we use simple words while the grown-ups use technical terms."

*15-year-old girl delegate from Mali
Children's World Water Forum
Kyoto, March 2003*

Children's Water Manifesto

In the name of love, peace and harmony
– We the 109 children and young people

of the world representing 32 countries, pledge to seek the support of decision makers in planning, designing, implementing and evaluating programmes related to children, water, sanitation and hygiene. We want the decision makers to guarantee the participation of children and young people, according to the Convention on the Rights of the Child, and to ensure the participation, protection, survival and development of children and young people through promoting a safe environment for their healthy development and well-being. We assert the following:

Governments are obliged to:

- Ensure that children and young people are involved in the decision-making and policy-making processes beginning from planning through to implementation and evaluation of household water-related

programmes and issues, including access, safety, conservation, and use of water

- Improve water and sanitation facilities, particularly for girls so that they can stay in schools. Therefore allocate sufficient budgets for water and sanitation programmes in schools. Reallocate investments on armaments as budgets to support school programmes and child-friendly facilities
- Strengthen partnerships and cooperate with children and young people, along with NGOs, government, municipalities, private companies and the media, to strengthen school programmes and child-friendly facilities
- Encourage free exchange and sharing of information, technology, and experiences across developed and developing nations, specific to household water security
- Take preparatory measures towards strengthening infrastructure and basic services during emergencies and train children and young people to exchange ideas and support during emergencies
- Respect children and young people's opinions and different cultures in

continued on page 27



In 1996 in Zambia, children drink and play with water from a Mark II handpump financed by UNICEF at Nthombimbi Primary School, a community school in the village of Nthombimbi, 40 km from the eastern town of Chipata. UNICEF-assisted community schools are substitutes for formal schools, often built, staffed and maintained in small communities by the parents for children who are very poor and cannot afford standard school fees, or who cannot travel the frequently long distances to go to formal school. Many of the children are also orphans, some of whose parents died of AIDS.

UNICEF/HQ96-1166/ GIACOMO PIROZZI

WATERfront

A newsletter for information exchange on Water, Environment, Sanitation, and Hygiene Education

UNICEF

**Programme Division
Water, Environment and
Sanitation Section**

Please send articles, illustrations and correspondence to:

The Editor, WATERfront


UNICEF Programme Division, WES Section
Three United Nations Plaza, H-7A
New York, N.Y. 10017. U.S.A.

Telephone 1-212-824-6000

Fax No. 1-212-864-6480

e-mail: wesinfo@unicef.org

Web: www.unicef.org/programme/wes

 Printed on recycled paper