Mid-Term Evaluation Report

A UNICEF – WHO Joint Project on

Building Community Based Arsenic Mitigation Response Capacity in Bhanga, Muradnagar, and Serajdikhan, Bangladesh

April 2003

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to the
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Planning Alternatives for Change, LLC & Pathways Ltd.

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Front Cover Picture Credits:

Halima, a mother of two from a small village in Comilla District, who was found to be so severely affected by arsenic that she could no longer dress or feed herself.

Picture: IDE Bangladesh, August 2002

Halima, in front of the 3,000 liter rainwater harvesting tank she received with assistance from Unicef and IDE. Three months after she received the tank, she was completely free of symptoms.

Picture: IDE Bangladesh, November 2002.

The views presented in this report reflect those of the authors only, and do not necessarily represent the views of UNICEF or the WHO.

Executive Summary

This is a midterm evaluation of the United Nations Foundation funded project, Building Community Based Arsenic Mitigation Response Capacity in Bhanga, Muradnagar, and Serajdikhan – in three upazilas (subdistricts) of Bangladesh. The project, which began officially in early 2002, is jointly implemented by UNICEF and the World Health Organization (WHO). Both agencies collaborate closely with Government of Bangladesh counterparts: especially the Department of Public Health Engineering (Ministry of Local Government, Rural Development and Cooperatives) and the Directorate General of Health Services (Ministry of Health and Family Welfare).

UNICEF is implementing arsenic mitigation activities in the three upazilas, whose combined population is 868,565. These activities (like those conducted in 42 other upazilas by UNICEF) consist of universal tubewell water screening, public education about the arsenic problem, arsenicosis patient identification, and provision of safe water options. The United Nations Foundation grant offers opportunities for enhancement of services above and beyond those that are expected of all Bangladesh arsenic mitigation programs.

WHO is concerned primarily with support to training of professionals, diagnosis and management of patients, improving water quality surveillance, provision of chemicals and medicines, and action research projects. Some of these activities are done together with UNICEF staff. Enhanced funding also allows for UNICEF to arrange GIS mapping and other sophisticated forms of database development. Both WHO and UNICEF do field-level monitoring of project activities on a random spot-check basis.

By June 2002 the project had completed the process of universal tubewell screening, public education, and patient identification (which still continues). The three upazilas were found to be exceptionally highly affected by arsenic. Since July or November 2002 the emphasis in villages has been on provision of alternative safe water options. Three NGOs are under contract with UNICEF to conduct this activity; each maintains an upazila office with 5-7 staff. Contracts will end in December 2003.

Alternative water options presently are limited by governmental regulation to those that do not involve arsenic removal. Drilling of deep tubewells (deeper than 500 feet) also is not permitted. The main options on offer at present are: rain water harvesting units, pond sand filters, and renovated or newly dug wells. One NGO is developing an experimental small-scale piped supply system. Persuading the public to give up their familiar and formerly trusted hand tubewells, most of which tap into shallow aquifers contaminated by arsenic, is an arduous community-level process requiring dramatic changes in both attitude and domestic water use behavior.

National Level Findings

Government agencies' capacity to cope with arsenic problem in a coordinated way shows signs of improving.

The process of testing and approving arsenic removal systems is altogether too slow. And the continuing public and DPHE enthusiasm for deep tubewells (DTW's) is harming this project by undermining community-level organizing efforts.

Training of health service providers is moving forward apace. The support of the United Nations Foundation has been especially helpful in this regard, and in development of training materials and improved diagnostic protocols.

Given present levels of staffing dedicated to it, this project cannot provide safe water to all populations of the upazilas, so from a public health point of view, this project is not moving fast enough.

There is a need for further discussion of the appropriate role for NGO's vis-à-vis government in the long run.

Existing research studies, relating to clinical issues, are useful; but more study is needed of the social aspect of the arsenic problem.

Upazila Level

The Upazila Nirbahi Officer's (UNO's) involvement is all-important. An energetic and interested UNO can activate upazila-level officers of all governmental departments. An uninterested one can hamper coordination.

Sub-Assistant Engineers of DPHE in some places have been very helpful with training, tubewell testing, and monitoring the work of NGO's. The Upazila Health Officers also have an essential role, but only one was found to be actively interested in arsenicosis.

There is scope for improvement at the upazila level: specifically

-Energizing at least one UNO

-Engaging Upazila Health Officers in Muradnagar and Serajdikhan

Training of medical officers needed in the three (as part of 15), and possibly also refresher training of Health/Family Welfare Assistants

There also is a need to define clear roles for all upazila-level officers (not just DPHE and DGHS) in promoting awareness and helping people to get safe water, health care.

Upazila "ownership" of the problem/solutions needs improvement, especially in Serajdikhan and Muradnagar. At this time upazilas are overly dependent on the project. Evidence of this was that there were no Upazila Arsenic Mitigation Committee meetings during a 2002 funding lapse, even in places where the committees had met more or less regularly.

Community Level

Public awareness of the arsenic problem has definitely improved as a result of this project's Phase-1 activities, with reinforcement of messages from mass media. Arsenicosis patients were found to be even more knowledgeable about arsenic than others.

Perceptions of safe water options are complicated. People still greatly prefer their familiar hand tubewell water over the new options being offered, but they are becoming accustomed to new ideas gradually. Relative scarcity of patients reduces fear.

Alternative safe water options are being given only in selected, highly affected areas. The evaluation team found people in other areas considering only green-painted hand tubewells or deep tubewells to be sources of safe water.

Because of delays in awarding two of the three NGO contracts, there has not been sufficient continuity/flow of services between the initial screening/other activities and the present mitigation work; this has confused many people.

Poor people are very concerned about the project's cost-sharing requirement. They observed in several places that more affluent people somehow are more able to get safe water than they are. Poor people are not easily welcomed into meetings where arsenic issues are discussed.

The evaluation team's field observations, however, found differences in the degree to which local leadership recognized the needs of the poor. In some places they had a charitable attitude, but in others they did not. The quality of leadership is probably more important than the attitude of contracted NGO's.

Patient Identification: Gaps in the System

There is no effective system in place at the moment to identify new patients and refer them to treatment. Except for DCH, the NGOs presently engaged in water options provision activities do not see other health related activities as part of their job.

The general distribution of patient lists in some places, as discussed in the section on upazila issues, violates norms of patient confidentiality. It is especially unwise in a country where arsenicosis patients tend to be socially stigmatized.

Safe Water Options

The project has provided very little in the way of safe water options because of various constraints and limitations. Some important experiments are under way in a few places, but population coverage is minimal.

Deep tubewells, green-painted tubewells, and the project's offerings are the most widespread and recognized safe water options. Wealthy people have been observed willing and eager to install their own deep tubewells.

There is an urgent need for consensus among all concerned actors – governmental agencies, non-governmental organizations, and private individuals – about what the most suitable safe water options actually are.

Capacity Building

The three-upazila Project, like others in the UNICEF system, is facing a dilemma: whether to devote resources to strengthen governmental and community-level understanding about arsenic and develop sustainable institutions to make decisions, on the one hand, or whether to speed up efforts to provide safe water to the affected public, on the other. These two needs are not entirely compatible in the present context, and all stakeholders grapple with them daily.

The present emphasis is more on mitigation programs, the provision of safe water options, and the handling of related technical and social complications, than on building decision-making capacity at the community level.

Village/Ward-level arsenic committees are rarely (if ever) functioning, but union parishad members get information from upazila meetings.

Recommendations

a. Governmental and NGO systems should strive for more common understanding and consensus on the arsenic problem, so that they can provide coherent messages to the public. Not enough governmental officers are thinking about possibility of making more use of dug wells, surface water, rainwater and other non-tubewell safe water options. The reasons behind the ban on blanket installation of DTW's should be "de-mystified" and broadly explained to all concerned professionals.

b. Improve monitoring of project activities. Do this by engaging a specialized monitoring agency to conduct regular and systematic field-level investigations of NGOs' activities, according to certain indicators. Periodic operational and financial audits would be appropriate. There is significant scope for development of community-based monitoring systems – using social maps and other easily understood graphics – to help people track their own progress in solving the arsenic problem.

c. Each upazila needs a clear and comprehensive plan to cope with its arsenic problem. All agencies working, or planning to work, on the arsenic problem should be included in developing such a plan.

d. Dhaka project managers, including those from WHO and UNICEF, should meet with UNOs of all three upazilas whenever they visit the field, in order to engage their interest in facilitating the development of such a plan. This mobilization effort should not be left entirely to contractor-NGOs.

e. Each upazila may consider forming a "think tank" or committee that will review and analyze safe water options being tried out there. The experiences of various organizations should be shared and compared. The United Nations Foundation funds could help to develop a suitable arrangement, supported with needed information, in each of the three upazilas. If this is done, the nature of the group should not be very bureaucratic or formal. The existing Upazila Arsenic Mitigation Committees, though useful, are not entirely suitable to the informal communication process that would make such an effort successful.

f. Publish a bulletin or newsletter to disseminate knowledge and learning from the project. Share it with the arsenic crisis website.

g. Newly elected union parishad chairmen and members need some orientation to the arsenic issue and the organization of this Project.

h. Perhaps some rich people here and there could be motivated to sponsor some alternative options other than deep tubewells at their own expense, to increase public awareness of the alternatives and expand the number of publicly visible demonstration models beyond what the project can presently provide.

i. There are important, unexploited local resources which could be mobilized: abandoned/derelict ponds, for example, might be suitable for installation of PSF systems. More use could be made of abandoned wells for re-excavation.

j. The trained tubewell testers have some basic technical knowledge. More use could be made of them as volunteers (paid or unpaid), to facilitate community planning and disseminate knowledge.

k. Develop some procedures that will allow hard core poor to gain access to safe water options through the project. Possible ways to do this would be: offering RWH units for two households to share; or subsidizing costs of dug wells, which are a good community option. Special meetings in poor communities could help to identify derelict ponds or other low-cost water options worthy of development. The government-mandated, uniform cost share requirement is not fair, as it generally

provides safe water options at prices that are too low for the rich and too high for the poor.

l. Patient numbers are likely to increase in the future. So there is an urgent need for continual monitoring, so that new patients can be identified and helped. There should be an increased effort to train local people, including the union health assistants, pharmacists, or quack doctors, to refer possible patients. Upazilla Health Complexes should become the main health facility for diagnosis and management. There is a need for better coordination arrangements between any non-governmental agency that identifies arsenicosis patients and health service providers.

m. Patient lists should be available to every upazila health complex (which they are not), and they should be considered *strictly confidential*. There should be no copies in the non-medical NGOs' offices.

n. Considering the limitation on resources, the Project's decision to prioritize places with more than 80 percent affected tubewells or with large numbers of arsenicosis patients is an appropriate choice.

o. In the other places, those not receiving intensive attention, a phased approach to safe water use, such as using rain water during the rainy season, may be the only practicable approach at this time. An option need not entirely replace the existing contaminated water source. Any amount of safe water is helpful. This concept may be especially helpful to the poor.

p. All NGO project implementers should be trained in PRA methods of helping communities to understand and assess safe water options.

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Abbreviations

APSU	Arsenic Policy Support Unit
BAMWSP	Bangladesh Arsenic Mitigation Water Supply Project
BBS	Bangladesh Bureau of Statistics
BRAC	Bangladesh Rural Advancement Committee (an NGO)
BRDB	Bangladesh Rural Development Board
CEGIS	Center for Environmental and Geographic Information Services
DCH	Dhaka Community Hospital
DGHS	Directorate General of Health Services
DPHE	Department of Public Health Engineering
DTW	Deep Tubewell
FGD	Focus Group Discussion
GIS	Geographic Information System
GS	Grameen Shikkha (an NGO affiliated with Grameen Bank)
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
KAP Survey	Knowledge, Attitudes and Practices Survey
NAMIC	National Arsenic Mitigation Information Center
NGO	Non Governmental Organization
NIPSOM	National Institute for Preventive and Social Medicine
PRA	Participatory Rapid Appraisal
PSF	Pond Sand Filter
RWH	Rain Water Harvesting
SAE	Sub-Assistant Engineer
UAMC	Upazila Arsenic Mitigation Committee
UHC	Upazila Health Complex
UNF	United Nations Foundation
UNICEF	United Nations Children's Fund
UNO	Upazila Nirbahi Officer
WHO	World Health Organisation

1: Introduction

This is the midterm evaluation of the United Nations Foundation (UNF) funded project in three sub-districts (upazilas) of Bangladesh: Building Community Based Arsenic Mitigation Response Capacity in Bhanga, Muradnagar, and Serajdikhan. The project is operating under the joint auspices of UNICEF and the World Health Organization (WHO), both working in close collaboration with some Government of Bangladesh agencies, especially the Department of Public Health Engineering and the Directorate General of Health Services. The project "aims to develop a replicable model for arsenic mitigation using an integrated and community-based demand-responsive approach" to the problem. "Sustainability is ensured through involvement of local government and NGO's, and through the creation of multi-stakeholder upazila- and union level coordination committees…." The project outputs are intended to benefit the poor and under-served. (UNICEF 2003 & WHO 2003). The range of activities includes four that are required in all governmentally assigned areas: universal testing of hand tubewells, raising community awareness, patient identification, and provision of safe water options.

UNF funding in the three upazilas provides opportunities for enhanced programming above and beyond the basic mitigation work. For example, it has made possible certain critical improvements in the arsenic mitigation situation: sophisticated database development, revised health service provider training materials and diagnostic protocols, short-term studies on the efficacy of various arsenicosis treatment methods, and upgrading of over-all water quality testing capacity. The UNICEF part of the project officially began in January 2002, and the WHO part, in April 2002. Both expect to complete their work within the project period.

"UNICEF focuses on the screening of wells, awareness building and implementation of alternative water supply solutions, while WHO concentrates on support for training, diagnosis and management of patients, capacity building for water quality surveillance,… provision of chemicals and medicines, [and] on applied research and monitoring…." (WHO 2003) UNICEF and WHO both are engaged in training of health service providers and related activities. Basic project activities are:

- Universal screening of hand tubewell water in all three upazilas (completed task)
- Raising community awareness of the arsenic problem (campaign completed in June 2002)
- Formation of Arsenic Mitigation Committees at upazila and village levels (partly completed)
- Patient identification (initial process completed in June 2002)
- Identification and provision of safe water options (under way)
- Training of upazila health service providers (partially done)
- Development and upgrading of water quality testing facilities (under way)
- Research on arsenicosis patients and treatment methods (under way)

The project is presently in its "mitigation" phase, having completed initial screening and related activities in June 2002. Three non-profit organizations/NGO's are responsible for community-level activities. They are BRAC (in Bhanga Upazila, Faridpur District), Grameen Shikkha (in Muradnagar, Comilla District), and Dhaka Community Hospital (in Serajdikhan, Munshiganj District). All three are under contract with UNICEF and in the second year of project operations, which officially commenced in July 2002 for Grameen Shikkha and in November 2002 for the other two[1]. Among their other activities, the NGO offices (which had large numbers of testers-cum-field educators in the screening phase and 5-7 project staff continuing on to do mitigation) are responsible for the creation and support of Arsenic Mitigation Committees. Formation and functions of such committees are mandated by a Government (Cabinet Division) order issued in November 2000, a translation of which is in Annex 4.

There are a great many arsenic mitigation projects and programs underway in Bangladesh now. As the arsenic crisis has drawn attention to the importance of considering over-all water quality, the Bangladesh Center for Scientific and Industrial Research is testing several systems for removal of arsenic from drinking water. Until these tests are completed, the Government of Bangladesh will not authorize general distribution of such systems. The Government has divided responsibility for mitigation in 80 arsenic affected upazilas among five different agencies, UNICEF being one (with current responsibility for a total of 45 upazilas), and is itself conducting tubewell screening and mitigation activities directly in 188 others.

The three upazilas covered by this project were selected from among a batch of 15 which were assigned to UNICEF in 2001 by the Government's Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP). They are in three different districts and represent different types of hydro-geological situations, thus offering opportunities to try out alternative water options under different conditions. All, however they may differ in other respects, are highly arsenic affected. In Muradnagar, for example, the arsenic concentration in the water of 93 percent of tested tubewells was found in 2001-2002 to be more than 0.05 mg/l (or 50 ppb); in Bhanga, 91 percent; and in Serajdikhan, 47 percent. Many (even most) villages in all upazilas are more than 80 percent affected, and some are 100 percent affected. The total concerned population is 868,565.

At the village level the emphasis in this mitigation phase is on identification and provision of safe water options. Present governmental regulations prohibit general distribution of arsenic removal equipment, and there is a moratorium on drilling deep tubewells. So the project officially can provide very few options at present: rain water harvesting units (RWH), pond sand filters (PSF), and dug wells (also known as ring

[1] According to project managers, delays in issuing two contracts resulted from some problems with proposal development by the concerned NGOs.

wells). Plans for one small-scale piped supply system also are under development by Grameen Shikkha.

The three different types of wells presently in use are as follow:

1. Shallow tubewells (often arsenic affected and the most widespread type): Small diameter, drilled typically to less than 150 feet (but can be up to 500 feet deep);
2. Deep tubewells: Small diameter, deeper than 500 feet, generally bacteriologically safe, and with low risk of arsenic contamination. A fear among professionals is that careless construction (especially if coupled with high abstraction) can lead to contamination of deep aquifers with arsenic from shallow aquifers.
3. “Dug” or “Ring” wells: Large diameter, dug up to 45 feet depth. Not risk-free, but are less likely than shallow tubewells to be contaminated with arsenic. There is danger of bacterial contamination from the surface. Some are newly dug, and some are re-excavated older wells.

Community-level achievements to date are documented in Table 1. As this table shows, the size of the arsenic mitigation task is far beyond the capacity of NGO teams assigned to implement the project.

Table 1. Safe Water Options Provided in the Three Upazilas in Phase-2 as of 10 April 2003

Organiza-tion	Upazila (District)	Total No. Unions (Villages) *	Total Popula-tion*	No. Tubewells Tested in 2001-2002	Percent Arsenic-contaminated Tubewells (2002)	Mitigation Activities: Completed As of 10 April 2003					Comments
						PSF	Dug/Ring Well		RWH Units	Other	
							New	Reno-vated			
BRAC	Bhanga (Faridpur)	13 (208)	179,361	21,003	91%	2	2	2	20	3-*kolshi* units in Union Parishad offices	4 RWH units under construction. There is strong local demand for deep tubewells in all areas.
DCH	Sirajdikhan (Munshiganj)	14 (182)	272,000	18,631	47%	0	9	--	31	--	Planning 5 PSF, but may shift target to increase number of dug wells
Grameen Shikkha	Muradnagar (Comilla)	22 (308)	417,204	30,199	93%	8	3	--	500	See comment	Planning a piped supply system in one village on a pilot basis

* Source: Organizations' final reports on 2001-2002 work and other reports
**Source: UNICEF 2002 Progress Report (January 2003)

PSF: Pond Sand Filter
RWH: Rain Water Harvesting
Kolshi: water pot

2: Objectives and Methods of this Evaluation

The evaluation team's full Terms of Reference are attached to this report as Annex-1. The goal of this evaluation is to consider progress made so far in achieving project objectives, especially with respect to

- What institutional efforts at various levels have been put in place to facilitate the local empowerment;
- The processes and procedures that have been followed to engender local capacity in ensuring a sustained reduction of exposure to arsenic by individual households and communities;
- Use, functioning and sustainability of the technical options selected, within their operational setting;
- Ownership of the development process created at the village, union and upazilla level, especially with respect to empowerment of households and community, local government and local NGOs;
- The initial information and guidance which applied research and monitoring have generated.

These and other issues of special concern have been investigated at national, upazila, and community levels by a team of five consultants:

1. Dr. Suzanne Hanchett, of Planning Alternatives for Change, Team Leader
2. Mohidul Hoque Khan, of Pathways Ltd.
3. Shireen Akhter, of Planning Alternatives for Change
4. Monirul Islam, of Pathways Ltd.
5. Tofazzel Hossain, independent consultant

This evaluation study has taken approximately two weeks in March-April 2003. During that time the evaluation team has conducted a review of project documents, UNICEF and WHO field reports, NGO reports, and other background literature.

The team has made a concerted effort to investigate issues at the upazila and community level to the extent that time allowed. Qualitative study methods have been utilized to support all field findings. Field reports prepared by monitoring staff and consultants from both UNICEF and WHO have been used to supplement the evaluation team's own observations and inquiries. A list of places visited by the evaluation is attached as Annex 2.

Each of the three upazilas has been visited by at least two evaluation team members for a total of three or four days. During these visits team members have conducted in-depth interviews with upazila representatives of the contracting non-profit organizations, with chiefs of upazila-level offices of the Department of Public Health Engineering (DPHE) and the Directorate General of Health Services (DGHS), and also

with the over-all coordinator of upazila services, the Upazila Nirbahi Officer (UNO). In some cases meeting minutes have been reviewed by the evaluation team.

In villages team members have conducted audio-taped focus group discussions and key informant interviews with both men and women of all socio-economic levels. Alternative water installations have been observed, and some case studies done. The Team Leader has interviewed representatives of collaborating agencies and other concerned individuals in Dhaka. A contact list is attached to this report as Annex 3.

Throughout the period of this intensive study all persons contacted have been very cooperative and forthcoming. The evaluation team greatly appreciates the sincerity and helpfulness of all those who took time to respond to our queries -- in Dhaka, in upazila headquarter towns, and in villages.

The project's mitigation activities are not yet advanced enough to allow for a strong impact assessment, and many project activities are still evolving and even changing in response to various circumstances. Therefore, the evaluation team hopes to use this report mainly to highlight operational and other issues that have come up during interviews and observations; and to make some related suggestions about the project's direction in its second and final year.

Promotional material on rain water harvesting

3: The Institutional Setting

Administrative Units: Background Information

Administratively Bangladesh is organized in six hierarchical levels (1998 information, from the Internet site, http://www.bbsgov.org):

National Level

All Governmental agencies and the National Parliament have their headquarters in the capital city of Dhaka.

The Division

Bangladesh is divided administratively into six divisions, which represent groups of 4-17 districts.

The District

There are 64 districts in Bangladesh. All Governmental line departments maintain offices in each district headquarters town. Governmental activities are coordinated by a District Commissioner.

The Upazila (Sub-district, formerly called *thana*)

There are 493 upazilas in Bangladesh. Each centers on a small urban area, the upazila headquarters town, where many (but not all) Governmental departments maintain offices. The activities of various department representatives are coordinated by an administrator, the Upazila Nirbahi Officer (UNO). Every upazila headquarters town has an Upazila Health Complex providing primary and secondary care.

The Union

There are 4479 unions, each of which covers a number of villages. Each union is governed by a Union Parishad (Council), made up of nine members elected from specific wards plus three women members, and an independently elected Union Chairperson. Each union has a health center, which may or may not have staff.

The Village/Ward

There are 86,038 villages, which are grouped into electoral wards that elect Members to Union Parishads (Councils). Villages do not have formally elected leaders.

National Level Issues

This project is accountable to, and coordinating with, a group of oversight committees and agencies (both private and public), some of which are still changing their basic structures and operations. Two sources of stability are: (a) a firm, high level policy commitment to doing something about the arsenic problem, and (b) regularity of communication, formal and informal, among representatives of some, but not all, concerned agencies. Each agency, of course, has its own internal organizational issues; but on the whole they work well together at the national level, and coordination is improving. About the high level policy commitment, the present Government included

the arsenic problem on its "First 100 Days" list of priorities. As mentioned earlier, the Government issued a directive on 30 November 2000 that was intended to mobilize the population at all levels – ward, union, upazila, and district – to form arsenic mitigation committees.

> 'Once a patient comes to me, as a doctor I must tell him or her to go and get safe water. Unless the Ministry of Local Government is actually providing safe options, there isn't much I can do. The doctor isn't in a position to know what the safe options are for any given area, and the Arsenic Mitigation Committees don't actually do anything apart from holding district or upazila meetings'.
>
> --Comments of one physician

At the national level various formal coordination systems have been tried. The present system consists of a cabinet-level Secretaries Committee, which is reported to be giving serious attention to the arsenic issue, and two coordination/support institutions: (1) the Bangladesh Arsenic Mitigation Water Supply Project (BAMSWP), which is funded at least through June 2003 and also implementing its own mitigation programs; and (2) the Arsenic Policy Support Unit (APSU), formed by a meeting of the Secretaries Committee in July 2002. The APSU is intended to serve as a successor to BAMWSP, by assisting the government in policy formulation, coordinating relevant ministries and agencies, developing research and implementation partnerships, and monitoring, doing program evaluation, and reporting. APSU reports to the Secretary of the Ministry of Local Government (MLGRDC) but also serves the Secretaries Committee directly. APSU will be expected to maintain strong links to 11 or more governmental agencies, as its role increases. The evaluation team did not interview anyone from APSU.

Against the background of this changeable institutional setting, the group of people working on arsenic at the national level has remained more or less the same for the past few years, and additional agencies and organizations have become more and more involved. While some interviewees feel that the group could do more to inform the general public about what's going on with arsenic, this tight social/professional network has strong technical support from several public and private organizations, most notably the Bangladesh University of Engineering and Technology (BUET), International Development Enterprises (IDE), and the Center for Environmental and Geographic Information Systems (CEGIS).

Most significant among the newly active stakeholders is the Directorate General of Health Services (DGHS), which has recently launched an ambitious program to train all upazila level medical service providers on arsenicosis. An important new development is the addition of arsenicosis to the DGHS list of officially "reportable diseases." The problem remains, however, according to one Dhaka source, that there is virtually no coordination between the Ministry of Health and Family Welfare (including DGHS) and the Ministry of Local Government.

This national-level, semi-formal coordination situation, despite its shortcomings, is fairly good as development programs go in Bangladesh; but there still are unresolved problems. And some of them affect the operations of the three-upazila Project. A problematic but all-important agency is Department of Public Health Engineering (DPHE, part of the Ministry of Local Government), which has had a leadership role since the earliest stages of governmental action on the arsenic problem. DPHE is one of UNICEF's closest governmental affiliates, but it is also a source of some difficulties.

One of the most difficult current problems with DPHE concerns deep tubewells (DTW's). There has been a governmental decision, in the form of a draft order issued by the Secretaries Committee, to cease installation of DTW's – except in coastal areas – until it can be determined that the water from deep aquifers is actually arsenic-free and/or not likely to become contaminated following the construction of deep wells. In certain areas, for example, there is no impermeable layer between arsenic-affected

shallow aquifers and deeper ones. DPHE, however, continues to install DTW's in many areas. Some are installed in response to pressure from Members of Parliament; but numerous individual DPHE officers share the prevalent view that the DTW is the best safe water option. (One DPHE officer claims that the ban on DTW's applies only to donor-funded projects, not to governmental ones.) For various reasons, then, the agency does not adhere to governmental DTW policy. The inconsistency affects the operations of the three-upazila Project being evaluated. A few DPHE-installed DTW's already have been installed in working areas, totally undermining arduous local organizing efforts to develop other options, such as pond sand filters. And this problem seems likely to escalate in the future.

The DTW is a well known and popular option and widely assumed to produce arsenic-free water. Unlike pond sand filters or rain water harvesting units, the public needs no introduction to this technology, and many people in arsenic-affected areas are demanding DTW's. As explained in a previous report, however, the public's faith in DTW's may be misplaced. (UNICEF 2003)

> …The data from the three upazilas shows that there are already quite a few deep wells affected by arsenic, making deep wells not quite the risk free option they are often assumed to be (although…the reliability of the data needs to be investigated further. If the figures are correct, they will have national implications for arsenic mitigation in Bangladesh).
>
> --UNICEF 2003:21

The officer in charge of the upazila DPHE office, a Sub-Assistant Engineer is an important part of the Project's community-level work. Sub-Assistant Engineers are indeed reported to be helpful in promoting various arsenic mitigation activities locally. However, within the DPHE structure, they hold relatively low (Class-2) civil service rank and are not graduate engineers. They are thus less qualified than their counterparts in the upazila health complexes.

The three-upazila Project is complying with governmental requirements, even though the government itself sometimes does not adhere to them. In addition to the restriction on DTW's, there is a requirement that the public contribute 20 percent of the cost of any new water source installed. This requirement, outlined in the 1998 *National Policy for Safe Water and Sanitation*, is being observed in the Project areas, where people are providing the required contribution whenever a PSF, dug well, or RWH unit is installed. Discussions at the community level indicate that this requirement limits access of the poorest households to certain options, especially RWH units.

Another governmental constraint on Project activity is the restriction on providing arsenic removal systems, such as the Sidko Plant (a community option) or the Shapla filter (for household use). These and other arsenic-removal technologies are being carefully tested by the Bangladesh Center for Scientific and Industrial Research. Tests are going on both in laboratories and in field settings, in hopes of guaranteeing that the treatment system itself will not cause further problems later on. As important as this testing process is, it is limiting the options that can be made available to the public at large, including people covered by the three-upazila Project.

Because there are so few available safe water options, the evaluation team found high levels of frustration and impatience at all project levels. People are impatient to get safe water one way or another, and professionals are impatient to provide it.

The Role of Non-governmental Organizations

Questions about the relative suitability of governmental *vs.* non-governmental development agencies came up in numerous Dhaka and upazila-level interviews conducted by the evaluation team. The debate, which has its own history in the Bangladesh context, centers on two questions: Which type of agency provides the better quality of services to the public?, and Which type of service is likely to survive

in the long-run (to be more "sustainable")? Another question also arises: Can NGO's themselves overcome their own inherently competitive relationships and collaborate effectively? These questions have no simple answer. Feelings are strong on all sides, among believers in government-only, NGO-only, or partnership program models.

This Project (like most other arsenic mitigation projects in Bangladesh) is, of course, pursuing the partnership approach, although various individuals within the system adhere to the full spectrum of opinions about its value and effectiveness. Governmental agencies have the advantage of being universally responsible to serve the whole population, and of having staff with standardized qualifications. They have the disadvantages that lower-level staff may not be authorized or encouraged to take initiative; and a great many staff are transferred from place to place every few years. Non-governmental agencies have an ethos of community service and flexible staffing. But they have the disadvantages of never covering the whole country and their vulnerability to extreme fluctuations in funding. In a developing country such as Bangladesh, both governmental and non-governmental agencies find themselves now and then giving large donors' agendas priority over their own. So it can be difficult to set a direction and keep to it.

In the operations of the three-upazila Project the evaluation team has observed both good working arrangements and mistrustful relationships. DPHE is reported to have become comfortable with delegating some local water related tasks to NGOs. Upazila-level working relationships were found to be good on the whole. All three of the NGO's contracted to work in this project are large, relatively stable and reliable organizations, though even they are subject to the vagaries of uneven funding flows. With staffing levels of 5 to 7 persons in each unit, however, they cannot possibly achieve full mitigation for their upazila populations.

An important issue of governmental-non-governmental coordination has arisen in the case of arsenicosis patient identification and management. Dhaka Community Hospital (DCH) was given the responsibility for patient identification in the screening phase[2]; but in the mitigation phase the organization is implementing project activities only in one upazila, Serajdikhan. The 134 initially identified patients identified by DCH (plus 30 others found later) in Serajdikhan are receiving treatment and referrals through DCH's own office-*cum*-weekly arsenic clinic. The 488 patients in Bhanga and 440 in Muradnagar, however, were not provided with direct referrals. Rather, DCH handed over patient lists to the respective upazila health centers without further follow-up. This type of arrangement – having one service system identify patients and another provide treatment – creates a situation in which a certain number of patients will not receive the continuous care they may need. Indeed it seems inevitable that a certain number may actually get "lost" and receive no follow-up care.

The evaluation team's field findings were as follow. In Bhanga the Upazila Health Officer claimed that the arrangement had worked well, and they are trying to treat these and other arsenicosis patients at a special Monday clinic dedicated to their needs. This Health Complex receives additional (and appreciated) support from a WHO physician conducting research on treatment outcomes. In Muradnagar, which does not have an Upazila Health Officer on duty, much less is being done to follow up on patients identified by DCH. The Resident Medical Officer said he had never seen the DCH patient list, but he recognizes the identified patients by the fact that they carry a DCH registration card. In Serajdikhan the situation is quite different from that in the other two locations. the Upazila Health Officer said he had never seen more than one arsenicosis patient; and he appeared disgruntled by the role DCH had assumed for

[2] A total of 1062 patients were identified the initial patient identification phase. This number represents a diagnosed arsenicosis rate of 94/100,000 in the concerned population. The rate in Bhanga, however, was 197/100,000. (UNICEF 2003:19)

itself as the preferred arsenicosis service provider. The Serajdikhan Upazila Health Center reportedly has a large stock of anti-oxidants given by UNICEF and as no arsenic patient uses their service, they are willing to hand it over to DCH or return to UNICEF. Alternately they want permission to use them on other patients. The Project in this case has actually distanced the governmental health service from the arsenic issue, replacing it rather than engaging it. There is a strong resentment about this among the hospital doctors.

Another finding of concern is the perception on the part of the other two NGO's, BRAC and Grameen Shikkha, that their present responsibilities do not have any health aspect whatsoever. As large as the job of providing safe water options already is, they need not be so completely detached from the patient identification and referral process. This may possibly reflect a lack of communication or cooperation among the group of NGO's doing screening, DCH defined as the only health specialist among them.

In the interest of building a sustainable system that can help arsenic patients, UNICEF has decided to put more emphasis on strengthening the capacity of governmental health service providers in the future, and to make less use of non-governmental health services such as DCH.

Whatever the possible shortcomings in the program, these comments should not detract from the fact that a concerted and sincere effort has been made, and is continuing to be made, by both UNICEF and WHO to identify all arsenicosis patients in the three upazilas and to help them find their way to care. Physicians employed by WHO-Bangladesh for field research and project management, are definitely perceived as helping out with upazila health complex efforts to treat and support arsenicosis patients (in Bhanga especially). According to some reports, this project and others managed by UNICEF are giving far more emphasis to the health aspect of the arsenic problem than any others in Bangladesh, except for a small Japanese funded program in one area.

Health System Improvements

Each upazila has a health complex with up to nine medical officers (physicians), who are supervised by an Upazila Health Manager (also called Upazila Health and Family Planning Officer/UHFPO). Not all health complexes are fully staffed. There typically are at least three medical officers, but a few centers have none at all[3]. In addition there are a number of Health Assistants or Family Welfare Assistants, who visit all areas to do surveillance on reportable diseases, give immunizations, distribute contraceptives, and refer patients to primary or secondary care facilities.

The approach to training has changed since the beginning of the three-upazila Project. The initial focus in the three upazilas (as part of a cohort of 15 under UNICEF) was on training field workers, the Health/Family Welfare Assistants, on the assumption that it was they who would be identifying patients as they made their rounds through the villages. Responsibility for this training initially was assigned to DCH, but some supplementary training has been provided (in February 2003) by DGHS with WHO staff support.

Observing in field visits that DGHS staff were poorly informed about arsenicosis, and also poorly informed about the activities of project NGOs, the WHO Environmental Health Unit's Medical Officer became concerned about inadequacies in the permanent (governmental) system of patient identification, referral, and treatment.

UNICEF (Health & Nutrition), WHO, and DGHS, therefore, together have upgraded arsenic related medical training materials and diagnostic protocols; and a new medical records system has been designed for use of health service providers. Using improved

[3] Information from Dr. Saima of UNICEF; see also WHO 2003 regarding weak capacity of the system.

training materials, DGHS and WHO are training medical officers as well as field workers. Medical officers are receiving two days of training in Dhaka, and field workers are receiving two days of training in their upazilas plus ten days of guided field experience in patient identification. The program is set up to conduct training for 200 field workers in each upazila, not only the Health/Family Welfare Assistants, but also paraprofessionals working at each Union Health and Family Welfare Center and various others, such as pharmacists. These extended training programs are starting in 24 upazilas where UNICEF is commencing arsenic mitigation work[4]. It is assumed that each Upazila Health Officer will participate actively in this training; and resource persons from DGHS will emphasize their critical role in the training.

According to WHO, the three project upazilas have now been covered by the expanded training plan for Health/Family Welfare Assistants and Medical Officers alike. The DGHS Director of Planning, who is also Line Director for Environmental Health, however, will be transferred in mid-April 2003. By all reports, he has contributed energetically to the upgrading of training, diagnostic protocols, and medical records. His replacement will need to be oriented anew to the arsenic issue, collaborative relationships, and the complex tasks associated with making the public health service responsive to arsenic-affected patients.

[4] Information from Dr. Saima Khan, UNICEF, and Dr. Ranjit Kumar Dey, Director of Planning, DGHS

4: Action Research

The immense scale of the Bangladesh arsenic crisis is highlighting the need for scientific knowledge of all sorts. While the effects of arsenic contaminated water are more or less understood, the effects of consuming various species of arsenic found in the food chain are not well known. (UNICEF 2001) Most health professionals treating patients in early stages of arsenicosis are working in an experimental way, as few if any treatments have been proven scientifically to be effective. ICDDR,B (earlier name: International Centre for Diarrhoeal Disease Research, Bangladesh, now Centre for Health and Population Research) is conducting epidemiological research in one specific study area (Matlab). This study was formulated at the initiative of WHO and is now supported as well by SIDA and USAID. Initial findings on reproductive health and neuro-motor development will be available by August 2003.

With assistance of the United Nations Foundation UNICEF-Bangladesh has been able to build a database and produce GIS maps defining areas where patients have been found and various percentages of wells affected by arsenic. This information certainly would be helpful in any future epidemiological investigations in the UNICEF managed upazilas.

All patient study projects require approval from the Bangladesh Medical Research Council (BMRC). The WHO Environmental Health Unit, which is involved in screening research proposals, has been working as a catalyst, to put BMRC in closer contact with researchers and organizations working on arsenicosis. A technical committee has been formed under the chairmanship of the BMRC Director to monitor and supervise ongoing research activities in the UNF sponsored project areas. A website is under development for dissemination of information on past and present research projects.

One research project has commenced with support of the United Nations Foundation project grant, and another is about to begin in the three-upazila project areas. WHO-Bangladesh in January 2003 started a six-month observational study of differences among five groups of Bhanga arsenicosis patients, according to whether they actually do or do not drink arsenic-contaminated water and whether they take anti-oxidants[5] regularly or not. The progress of individuals in each group will be measured monthly. This study is a logical and useful one in the context of Bangladesh, where many continue to consume arsenic-affected water for various reasons even though they understand that it may harm them. (Hanchett et al. 2002)

A second research project, proposed by Maidul Islam, of Bangabandhu Sheikh Mujib Medical University, has been approved by the Bangladesh Medical Research Council and is planned to start in May 2003. It will be a randomized, controlled trial to evaluate the effectiveness of various concentrations of salicylic acid in ointment used for topical treatment of keratosis. The idea for this study, which is to continue for nine months, came up at a November 2002 Regional Consultation on Arsenicosis Case-detection, Management and Surveillance in New Delhi. It became evident that dermatologists of various South and Southeast Asian countries are using different concentrations (from 5% to 50%) of salicylic acid in ointment for management of arsenic-related hyperkeratosis. Although claims of success were widespread, no one had ever tested

[5] Vitamins A, E, and Beta-carotene

the effectiveness of one concentration as compared to others. This study should produce some concrete guidance for future treatment protocols.

WHO has in hand a number of additional proposals, none of which has yet been approved by BMRC. One study would be a randomized, placebo-controlled trial of alcohol extract of spirulina plus zinc in the treatment of arsenicosis. This is awaiting approval of BMRC's ethics committee. Two other proposals are being reviewed by WHO's Environmental Health Unit for possible submission to BMRC: "The effect of arsenicosis on pregnant women and its complication on newborns;" and "Correlation between nutritional status and arsenicosis patients."

A proposal has been developed by the National Institute of Preventive and Social Medicine (NIPSOM) to do a long-term cohort study of complications and improvements among arsenicosis patients carefully and regularly examined by expert diagnosticians. This study, worthy as it may be, is not considered to be affordable or realistic within the present dimensions of the United Nations Foundation funded project.

UNF funding is supporting three research and development activities being undertaken in collaboration with UNICEF:

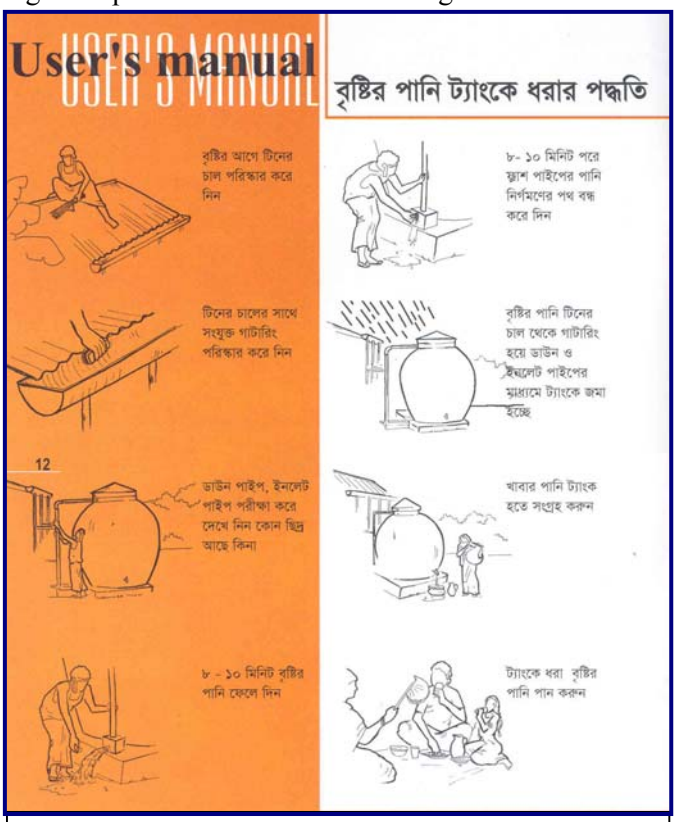
1. Research and development of an improved pond sand filter by BUET. This study aims to address the weaknesses of the current PSF design in the hope that a better functioning unit may be more appealing to users. The study is expected to be completed by November 2003.
2. Research and development of a community-operated Slow Sand Filter (SSF), which performs multi-stage filtration of river water. This study, being conducted by an NGO, aims to create options for the treatment and subsequent distribution of river water for domestic use. Completion is expected in September 2003.
3. A "Decision Support System" for arsenic mitigation, including both "vulnerability mapping" and a dynamic monitoring system. Being conducted by CEGIS, this study aims to incorporate available primary (contaminated wells, safe water sources, available water bodies, e.g.) and secondary data (e.g., census data or school and hospital data) into a system that can be used for planning, monitoring, and other purposes.

There also is a need for some sociological and ethnographic research to analyze the social, economic, and political dynamics of various kinds of mitigation efforts. The community visits of the evaluation team and UNICEF or WHO monitors have shown that different sectors of the rural population are affected very differently by the arsenic problem, and by efforts to solve it: the experiences of rich and poor, or men and women; or the elderly and children, for example, need to be examined closely for the sake of future program development. These types of investigations could be combined with nutritional or other health status studies, as they most probably are in the above-mentioned ICDDR,B project.

As mitigation efforts encounter more and more complications at the community level, such studies could provide a guide to avoid the most obvious pitfalls, in terms of locating and managing various alternative water options. The *social* side of such activities is as critical as the technical, although this often is understood only after the fact. They also could help with refinement of future public information campaigns.

5: Water Sources and Options

As previous chapters have mentioned, there are very limited safe water options being offered in any official Bangladesh arsenic mitigation project nowadays, the three-upazila project included. Each of the main options being offered – pond sand filter, rain water harvesting, and dug/ring wells – has its advantages and disadvantages in relation to various sectors of the population. And each one poses both social and technical challenges. Pond sand filters require elaborate negotiations with pond owners, who must make commitments (a) not to use their ponds for fish culture, and (b) to share use of the water with a group of neighbors. Ponds are rarely owned by individual households. Usually they are shared by brothers and cousins; so a great many people must agree. Rain water harvesting units pose more technical challenges than social ones. Constructing them requires careful attention to quality of materials, proper curing, and so on. There is some disagreement among project staff about whether users need special training to maintain them, but the evaluation team found some to be poorly maintained. Newly dug wells are mostly possible only for groups of affluent families; but re-excavated wells tend to be more affordable and accessible to their wider communities. Construction techniques must ensure hygienic conditions to avoid contamination.



Page from a rain water tank user's manual

All of these options have at least one thing in common: the public does not readily accept them. They are options that, if used in the past, have fallen out of use during the last three decades. These types of water sources have become somewhat repugnant to a public now thoroughly accustomed to using hand tubewells. Concerns about sharing sources and possible pollution of sources are frequently expressed. Even educated people of Bangladesh are not generally aware of the new types of options being promoted. For example, Medical Officers reportedly do not understand much about alternative safe water options such as RWH units.

Cost-sharing limits poor people's access to most options, especially RWH. So UNICEF and WHO are trying out a low-cost RWH unit for possible distribution. Reportedly, IDE is working on this.

Grameen Shikkha and BRAC both will soon be piloting small-scale piped supply systems in one village each. The source will be a deep tubewell, and several water taps

will be installed around the village. If this is successful, it will be perceived as an improvement over the hand tubewell system. This would distinguish it from the other options presently on offer. According to the GS Project Coordinator, if the deep tubewell water should become contaminated by arsenic, it would be possible to treat it at the source.

An important distinction is that between household-level options and those that can serve groups of households. RWH units are mostly set up for individual households, but dug wells and pond sand filters work for many households, possibly 20-50, if suitably managed.

There has been some inconsistency in Government policy concerning household-level options. Although the RWH unit is fully approved, another household option, known as the Proshika-Canada filter, was disallowed by DPHE on the grounds that it is solely for household use and not a community-level option. BRAC, with encouragement from UNICEF, had originally proposed to distribute some of these filters on a trial basis. But DPHE's decision made it necessary to remove the filter from the list of options.

Water Quality Testing Improvements

"What will be the next arsenic?" asked one professional interviewed by the evaluation team. The Government of Bangladesh and all others concerned with technical issues are greatly concerned to improve water quality testing facilities that can reliably detect all sorts of possibly dangerous elements in water. An important recent development is the finalization of draft water quality monitoring guidelines, now awaiting final approval by the Chief Engineer of DPHE. These guidelines, once approved, will have the advantage of spelling out the steps needed to monitor the quality of water from many types of sources, including surface water, rain water, dug well, piped scheme, in addition to more familiar tubewells. They specify what to test for, how often, and so on.

The main efforts to strengthen water testing have focused on the four zonal laboratories operated by DPHE with funding from various sources, including UNICEF, WHO and World Bank. Plans are under development to create three more zonal laboratories as well as three facilities, starting with these three upazilas. These types of facilities can greatly help to maintain public health in Bangladesh, *but only if properly staffed, managed, maintained, and periodically monitored*. There is a clear need for some kind of testing capability in every district, and even in every upazila. Some preliminary tests of portable water testing kits are under way; if successful, they could greatly expand possibilities of ensuring improved water quality testing at local levels.

Testing water samples in the field using the Merck field test kit.

Logistical difficulties are pervasive. For example, the evaluation team found 180 Merck test kits lying unused in the Muradnagar DPHE office for a long time. The SAE said he could not arrange transport to return the kits to UNICEF.

6: Upazila Level Issues

Coordination

The project's coordination framework in the three upazilas follows official GO-NGO collaboration norms, by which one NGO is the lead agency providing resource support and implementing regular project activities. On the Government side, the upazila administration supports the causes of the project but has no Government funding allocation to carry out regular activities. This coordination framework operationally has emerged on this basis, however, without the benefit of any broader plan of action to solve the arsenic problem in the project upazilas.

Upazila administration supports are critical in terms of making local power structure supportive and mobilizing assistance from all concerned government departments to implement the project in whole upazila. At the upazila level, the UNO's role is vital for coordinating the activities of various actors in any particular field. In this project, of course, the Sub-Assistant Engineer (SAE) of DPHE, the Upazila Manager/Coordinator of the contracted NGO, and the Chief Upazila Medical Officer are critical service providers; and local government representatives and other community leaders are the motivators and key actors. For good coordination, the UNO must be knowledgeable and interested about arsenic. The other project partners help to keep him vigilant. Optimal operating conditions can be defined for this, as for any other project: government policies that are logical, smooth project support, minimal political interference, and key members who are reasonably stable.

In each of the three upazilas, the evaluation team found that one or more of the above-mentioned ideal preconditions was not met. In Sirajdikhan Upazila, for example, the UNO has joined only 6 months back; and he claims that he has not had time to concentrate on the arsenic problem due to recent union parishad election (January – March 2003) related preoccupations. For the same reason the political situation was not supportive for the NGO (DCH) to conduct project tasks smoothly. The DPHE office is unstable due to inadequate manpower. The SAE remains absent most of the time, because he is about to be transferred; and three out of four mechanic positions are vacant. A further problem in Sirajdikhan is that the Upazila Health Complex (UHC) remains outside of the scene as regards arsenic patient screening and treatment, due to the fact that DCH has special expertise on the subject.

However, the general situation is relatively better in other two upazilas, where the key persons (UNO, SAE-DPHE, NGO Manager) were found to be more stable, the UNO was taking interest in the project, and the UHCs have gotten involved. As a result the contracted NGOs are more able to exert influence, with the effect that upazila level meetings are more frequent, and decisions tend to be followed up. In Bhanga there is the additional advantage of an unusually enthusiastic UNO with a scientific research background. Even under these good conditions, however, results are far from optimal because of some other deterring factors, including lack of strong administrative support and poor coordination and communication among various institutional stakeholders.

Knowledge Sharing

Our quick investigations reveal that there is an inadequate institutional arrangement for knowledge sharing among the various parties involved in arsenic at the upazila level. For example, it took time for us to know visiting the upazilas that the International Development Enterprises (IDE), an international NGO, has been working under UNF support in all the three upazilas specially in promoting the RWH in two models (household and institutional). We only heard that IDE model of RWH was being used with their technical support. In none of the upazilas they are known to be attending the Upazila Arsenic Mitigation Committee (UAMC) meetings. In Bhanga, the January 2003 meeting decided to invite IDE and another NGO in the next meeting and in Sirajdikhan the Technology Marketing Officer of IDE (who is a B.Sc. in Engineering and M.S. in Water Management) is still unknown to the UAMC members. It was also learned from respondents that other NGOs, such as Proshika, Grameen Bank or BRAC, also had some programs that directly or indirectly relate to solving arsenic problems. The Proshika-Canada Filter, for example, once was one of the safe water options of this project -- though now cancelled, as discussed above. Grameen Bank had a program of testing tubewells of their group members in Sirajdikhan before this project was undertaken. BRAC has a lot of experience with promoting arsenic awareness, research, and even patient treatment in many places. These micro-credit NGOs could provide funds for individual and community level options. In the Upazila Health Complex there are many qualified doctors who could be valuable resources.

The project has made a sincere attempt to share project data. Each union chairman, for example, received the data in book form with simple explanations in Bangla about how to interpret them. Included were suggestions about how to use the maps as information sharing and discussion tools. Similar data were handed over to each UNO, DPHE SAE, and other officials; and maps in different formats also were sent to District Commissioners. Such knowledge sharing is vital for bridging the gaps and misunderstandings that divide individuals and organizations, but it may need periodic reinforcement to be meaningful.

Knowledge sharing on arsenic issues at upazila level was found to be very limited in fact. Now oriented toward providing safe water options, the Project's current priority is not on dissemination and sharing of knowledge. Instead, Project staff aiming to reach their proposed goals, tend to gather and share knowledge only insofar as it is relevant to the task at hand. Most of what program people know seems to be based on discussions and dialogue with WHO, UNICEF and knowledgeable NGO staff. There seems to be a need for some renewed information sharing.

Village-level knowledge sharing between different participant groups of the project also is not a priority, due to NGOs' having so much to do and feeling overburdened by project works. Gathering ordinary people's perceptions and knowledge on water management is very important. It is not clear to what extent union chairmen actually made use of data provided. Low levels of scientific knowledge on arsenic at both upazila and community levels are major constraints to organizing a strong response to combat the arsenic problem. People's choice of options is not knowledge-based but immediately needs based.

Presently it has been noticed that the contracting NGOs and also others are promoting their own organizations' ideas and technologies without consulting the UAMC. This is also creating confusion and mistrust among various organizations working at the upazila level.

Thus, it is important that there be some type of consensus-based authority on the arsenic problem in every upazila. The UAMC could help to work out the structure of such an authority and its *modus operandi*. But the UAMC itself is not entirely suitable, since its membership is too limited. UNF might wish to support such an initiative.

Upazila Arsenic Mitigation Committees

Both in Bhanga and Muradnagar upazila arsenic mitigation committees (UAMC) have been formed and are working as separate bodies under UNO leadership. The evaluation team was unable to gather any information about the status or functioning of the Sirajdikhan committee. The UAMC in Bhanga and Muradnagar is mistakenly perceived as a *project* initiative, rather than the result of any ministerial order or instructions. This perception is reinforced by the fact that the project has been paying an honorarium to attendees. The functioning and status of UAMCs thus are dependent on the level of effort coming from the project to keep them going. In both upazilas UAMCs were found to be irregular during the past year. An important finding was that in 2002 when there were delays in renewing NGOs' contracts, with a resulting lapse in the flow of project funds, UAMC meetings were temporarily stopped.

Officially it is the DPHE SAE, as Member Secretary, who is responsible to organize the UAMC meetings and keep meeting records. However, it is actually the NGO who pursues both the UNO and the DPHE-SAE to organize each meeting.

> Sumi Begum is a newly elected woman Member of the Boyragadi Union Parishad, in Serajdikhan Upazila. She has very little information about the arsenic mitigation project, but she does know that in 2001 there was mass testing of tubewells and some mapping. She and her family know about arsenic. When their tubewell was painted red, her husband removed the head, so that the children would not drink from it. They collect drinking water from a green-painted tubewell near their village mosque. They use pond water for other purposes.
>
> -- April 2003 field report

In Bhanga the UAMC now is regular. The last monthly meeting was held on 15 March 2003. In Muradnagar the last meeting was held in December 2002. Since then no attempt has been undertaken to organize due to time constraints of the UNO. Meeting participants are of three categories: upazila government officers, union Parisad chairpersons and concerned NGO Staff. We checked some minutes of a few arsenic mitigation committee meetings. The meetings appear to be formal affairs, with a bureaucratic style of discussion and report presentation by an NGO representative.

Whatever their limitations, the UAMCs represent very positive efforts to coordinate and systematize arsenic mitigation in the upazilas. Despite their irregularity and low level participation of different groups, they surely have a far-reaching impact in implementing project activities and related local processes. Thinking strategically, the UAMC is key to further broad based coordination. The very formation of such a committee sets a precedent for people sitting together to share pressing problems of the locality.

The presence of union parishad chairpersons in UAMC meetings has secondary effects at the union and village levels. Chairmen get messages from upazila meetings and at least try to cooperate in implementing arsenic mitigation activities in their unions and villages. So existence of this committee directly or indirectly generates benefits for the project by supporting operation union and village level.

Change of Local Government Representatives

The recent (January-March 2003) union parishad elections, however, have almost completely changed the whole set of Chairmen and Members; and therefore the project needs consider a fresh orientation program for the newly elected officials.

Total Number of Organizations Working on Arsenic

Each upazila has multiple NGOs and other agencies conducting projects, some of which relate to the arsenic problem. For example, the NGO Forum for Drinking Water and Sanitation conducts training in almost all areas. BRAC claims that there are at least 12 other organizations working in Bhanga. The following organizations are known to be either working or planning to work on arsenic in the three study upazilas:

Sirajdikhan	Muradnagar	Bhanga
1. DPHE*	1. DPHE*	1. DPHE*
2. DCH*	2. Grameen Shikkha*	2. BRAC*
3. IDE*	3. IDE*	3. IDE*
4. Australian Aid	4. Upazila Health Complex	4. Upazila Health Complex
5. Proshika		5. Hunger Free World
		6. P.E.P. (a BRDB project)

* Agencies/Organizations that are formally part of the three-upazila Project

Continuity of Staffing

Information on the continuity of staff of the different organizations primarily involved (Upazila level officials, SAE-DPHE and mechanics, Contracted NGO staff, UH&FPO etc) could not be gathered in totality. But the available information shows that there have been significant numbers of changes and transfers during the project period, and at times key positions remained vacant. As mentioned earlier, in Serajdikhan the DPHE office is almost non-functional. As a result the progress of work is also slow. Only 13 out of 51 DTW's targeted for FY 2003 are or being installed. One DTW installed by this office about six months ago is out of order, and nobody can be found in the office to respond to complaints. The Upazila Manager of DCH is also new (about 5 months), although he has taken on responsibility very well and has brought new ideas based on his past experience. In Muradnagar a good number of project staff have changed. Such changes have at times caused the project to lose momentum and rebuilding capacity and filling in orientation gaps have taken extra time.

In brief we can say that, while staff changes are normal and inevitable, it is necessary that there be adequate arrangements to orient incoming persons with the latest developments, and to incorporate them into the team. This need is not met adequately in the project, due to the lack of clear and agreed-upon Bangladesh arsenic mitigation vision, and inadequate interaction among the many individuals and organizations that make up the environment of the project's upazila-level processes.

Training

Most training activities in this project were related with the screening phase. NGO representatives in Bhanga stated that the objectives of the training were to orient all sections of the population to arsenic problems and develop skills to carry out immediate arsenic related works. At that stage they organized sessions for different social and occupational groups. Occupational groups were block supervisors, primary teachers and local NGO staff. In Bhanga Project organized training for local theaters workers and later these theater workers performed for project to disseminate arsenic related message among community level people. These trainings went on for some time. The shortest was 3-4 hours, and the longest, 8-10 hours. NGO staffs were trainers

and sometimes DPHE SAE attended training as a resource person. Most of the trainings were held in the Upazilla headquarters towns. But some training sessions with village and arsenic mitigation committee member were held in villages and/or union parishad centers.

The project NGOs conducted one of the most important training activities with tubewell testers. This training undoubtedly improved local decision-making capacity and skills. The testers also communicated about arsenic to every village household visited. In Bhanga 81 testers were trained, and they tested 21003 tubewells. The DPHE SAE played a very important role in this training. He participated as chief resource person and also verified the work of the testers.

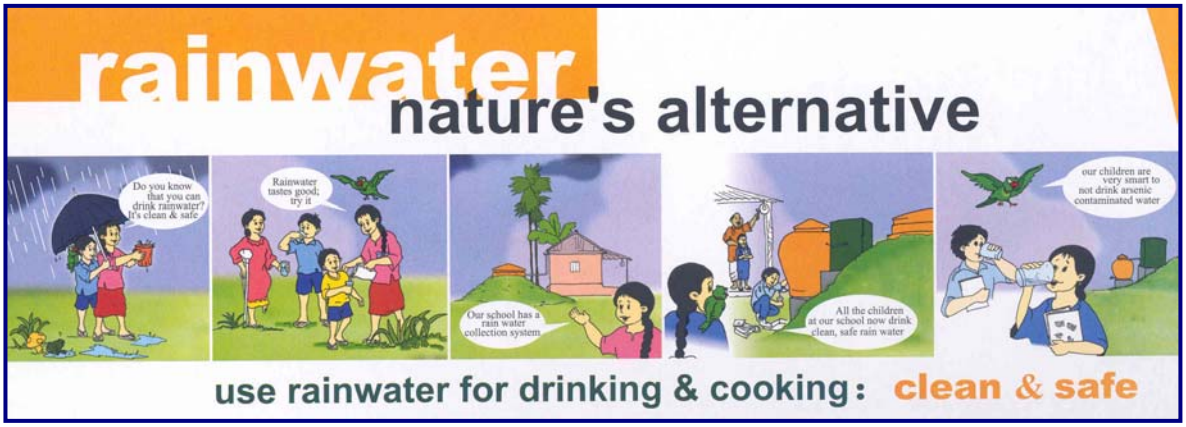
In the mitigation phase training activities are at a minimum. Project staff said that they oriented option committees and users through meetings and discussions. They have no time to organize any more structured training. The only important training organized in the three-project area recently has been that for Health/Family Welfare Assistants on arsenicosis diagnosis and treatment. In Bhanga 120 participants received this training in four batches. In Muradnagar training was conducted for 265 in six batches. In Serajdikhan 83 participants received training in two batches.

Deep Tubewells *vs.* Other Safe Water Options

As mentioned earlier, drilling of deep tubewells is officially discouraged but actually very popular with government officers and the public alike.

In one upazila the DPHE SAE is strongly committed to increasing coverage with deep tubewells. The existing number has been identified, and plans are in place to install more within the next financial year. This SAE is aware that some "experts" are discouraging the use of deep tubewells, but he said that the reasons were not widely discussed, and he still thinks they are the best source of arsenic free water. The upazila manager of the Project NGO is, however, arguing for surface water, rain water, and other options as the most sustainable ones. He considers deep tubewells to be risky.

One NGO representative described at least two cases in which careful discussions with villagers had resulted in agreements to install pond sand filters, but where the plans were abandoned once the people managed to get a deep tubewell from DPHE. A very similar report was made by the coordinator of another NGO, who requested that the Project ensure that deep tubewell installation be blocked in the areas where alternative options are being developed.



Example of promotional material

Patient Identification

Patient identification was conducted by the Dhaka-based agency, Dhaka Community Hospital (DCH) during the initial project period. Numbers of arsenicosis patients initially identified were:

Bhanga	488
Muradnagar	440
Serajdikhan	134

DCH did patient identification in its own way. There was little coordination and partnership with others during their field level identification survey. But after completing the survey DCH in Bhanga handed over its patient list to the Upazila Health Complex. Supposedly, it did the same in Muradnagar, but the Muradnagar Upazila Residential Medical Officer (RMO) claims that he has no such list.

In Bhanga, all major actors of arsenic mitigation project have information on the number of patients. The DPHE SAE even has the list of identified patients. The BRAC arsenic project manager knows the total number of patients but does not have the patient list. In Muradnagar Grameen Shikkha and DPHE have no patient lists, although the GS office people know the number of identified patients.

The Muradnagar Upazila Health Complex has a register of patients that come to hospital to seek treatment. But the records distinguish only between old and new patients. Those patients who bring DCH card are classified as ‘old patients’. Those who have no card and first come to the hospital to seek care are classified as ‘new patients’. The Muradnagar RMO, who is in charge of dealing with arsenic patients, said that he knows the Grameen Shikkha people but has had no discussion with them concerning arsenicosis patient identification.

Arsenic Patients’ Treatment Scenario

In Sirajdikhan Upazila, arsenic patients are being treated by DCH, as they have the needed expertise and a referral hospital at Dhaka for serious cases. Beyond the 134 patients initially diagnosed with arsenicosis, in the course of providing treatment they identified 31 more. DCH is providing treatment medicine to the arsenic patients in their centre once a week (every Wednesday). One of their doctors comes from Dhaka office for this. The patients are invited to return every three weeks, as the medicine is given for that period. According to their records, treatment started from 20 March 2002 and continues to date. An average of 10 patients visit per week, with a minimum of 1 (one) and maximum 21. The number shows an increasing trend over time. It is thus surprising to hear that the Upazila Health Complex (UHC) has not identified a single patient with symptoms of arsenicosis in the past two or three years.

In Muradnagar Upazila, which is a highly affected arsenic area, the contracted NGO (Grameen Shikkha) was found to be almost ignorant about arsenicosis, except that they had the union-wise chart of the number of patients identified by DCH. They did not have the patient list. The UHC has one doctor assigned to treating arsenic patients, and any incoming patients are sent to him. He was seen to maintain a separate register for them with simple information, such as their names and treatment given. In the "Remarks" column a patient was designated as ‘New’ if he/she visited for the first time. The number of patient visits was very low (monthly around 20). There is hardly any field level patient screening arrangement at present. The Upazila Health Officer is very new and has come from an upazila which has no arsenic project.

In Bhanga the UHC gradually got involved in diagnosis, treatment and identification of new patients, There are clear differences in the ways the two upazila health complexes have responded to the need for arsenicosis patient care. In Bhanga upazila the UHC took some important steps to accelerate treatment-related activities. The first was assigning a specific doctor to deal with arsenicosis patients. Secondly, it declared one specific day for arsenicosis patients. And third, there was a recent training for field level workers on arsenic diagnosis and treatment. (The Bhanga Upazila Health Officer recognized the helpful presence of a young doctor, a WHO appointee, who is helping to sustain services to patients.) But the Bhanga UHC is facing shortage of medicines to continue the treatment.

In Muradnagar, the program of the UHC was found to be not as good as that of Bhanga's UHC. The Upazila Health Officer is new, and the Resident Medical Officer is in charge. He is not aware of all the issues. He informed the evaluation team that the UHC is providing ongoing treatment for arsenicosis. Other than maintaining a separate register with new patients' names and addresses, however, there are no special activities.

Water supply option: pilot arsenic removal plant (Ihteshamul Huq/DPHE)

7: Community Level Findings

The evaluation team was able to visit some 18 villages within the three upazilas covered by this project. Some of these villages are under consideration for safe water options, and some are not. At present the NGO field workers are only visiting communities where safe water options are to be installed.

> People are very confused. It isn't easy to motivate them to stop using tubewell water. Within one year it was quite difficult to communicate with them, much less change their behavior. Under the political conditions of Bangladesh, with members and chairmen so dominant, they have to be on the committees. And Awami League people are opposed to BNP members. If people from one party are on a committee, members of the other party don't want to attend meetings. Government people, even the UNO, are busy with other activities. …People come late to the UAMC meetings. They aren't disciplined. Some of the meetings are even cancelled. We invited the DPHE SAE to our workshop, but he didn't come on time. Generally government people have a self-serving attitude. They tend to look to their own benefit. This isn't easy.
> --Comments of an NGO representative

An effort was made to hear the points of view of those with and without safe water options, those getting and not getting safe water options, men and women, and people of various socio-economic levels. The evaluation team observed some examples of each type of option currently provided and tried to get some background on the sites observed. A WHO doctor conducting one of the research studies accompanied the evaluation team on some visits and helped to identify patients who were willing to be interviewed.

Village Arsenic Mitigation Committees

Although each NGO has produced lists of names of village committee members, the evaluation team was unable to find any functioning committees. One elected Ward Member of a Union Parishad was listed as the chair of a committee but had no knowledge of its existence.

> The people of Panchkul Village in Bhanga are currently drinking arsenic-contaminated water from a red-marked hand tubewell. They know it is harmful but have no alternative safe sources. They participated actively in meetings with BRAC and UNICEF representatives at the initial mitigation discussions, and they were promised a deep tubewell. According to the BRAC Upazila Coordinator, after this promise was made, the project cancelled the DTW as an option. Now he feels embarrassed to even visit that village.
>
> In nearby villages there are PSF and deep tubewells. The people do not like the taste of the pond water. If they have to travel, they would rather go to the place with the DTW. Anyway, the people of the village are very puzzled. Their collective question is, 'What will be next?'
>
> --April 2003 field report

Local comments suggest that the committee concept, insofar as it ever worked in practice, was more applicable to the screening phase, when group formation facilitated communication about the arsenic problem. Nowadays people have grown impatient with discussions about the issue and are eagerly awaiting the arrival of some safe water options.

A few people expressed the sense that the NGO was letting them down. They were led to believe that 'big things,' as they put it, would be done to solve the arsenic problem. And now they are disappointed with the slow pace of change. One woman said that, since no one had come to visit them in five months (during a lapse in program funding and operations), she assumed that the problem was not very serious after all, or maybe it was solved somehow.

Water supply option: protected dug well (Ihetshamul Huq, DPHE)

People's Perceptions of 'Arsenic'

People learned about arsenic initially during the tubewell testing and marking period. They remember being told that tubewells with red-painted spouts were affected by arsenic, and that tubewells with green-painted spouts had safe water. The colors of the spouts are hardly visible now, but the people seem to have no problem remembering how they were marked. Most of the people interviewed remember the individual NGO workers and tubewell testers who visited them, but they do not know the name of the organization, or whether they were from government or not. (Some thought that evaluation team members also might be from government.)

Educated people seem to know more about arsenic than others, but the understanding of many, educated or not, is reinforced and often improved by messages communicated through radio and television. Some people mentioned, for example, that they now know from mass media that arsenic is not contagious or hereditary. Nonetheless arsenicosis patients still experience many problems with social stigma, and many were said to be trying to hide the disease for social reasons.

> A female participant in a focus group in Serajdikhan reported that her tubewell had been identified as contaminated with arsenic and painted red during the testing period. Having no green-painted tubewell available, she and her family continued drinking the water. People saw this and criticized them. So her son painted the tubewell head green, and now no one criticizes them for drinking from a red-painted tubewell.
>
> --April 2003 field report

The evaluation team found considerable variation in levels of people's understanding of arsenic from one village to another. In areas covered by this project, virtually all know that the water of red-painted tubewells is contaminated, but their ideas of what that means vary. Comments about arsenic were: it is a poison, or a disease, or a rash or dark circle, or cancer, or a skin disease. In areas without patients people weren't sure if it was a virus or some other kind of contagious disease; only one person said arsenicosis was highly contagious. Some said they had seen patients' affected bodies on television, and they had either seen or heard about water filtering to remove arsenic. A few didn't have any idea at all; nor did they consider it to be something harmful. Arsenicosis patients under treatment were much clearer about arsenic causing certain symptoms and suffering, and about treatments.

Comments of Former Tubewell Water Testers

Two female and one male tester were interviewed about their experience in the screening phase and their present views. All were residents of Sirajdikhan. They received two days of training from DCH on testing and marking tubewells. They were paid Tk.5 for each tubewell tested and marked. After testing a tubewell they returned a second time, to inform the people about dangers of arsenic sickness and possible safe water options. They advised the people to drink water only from green-painted tubewells, and to eat plenty of nutritious food, especially vegetables.

The responses of the community people were not all positive. Some suspected they were just doing the testing to earn money and did not want to allow them to test their tubewells.

Some testers expressed dissatisfaction with the work of the NGO. They felt that the organization was not following up satisfactorily on its commitment to provide safe water. They also felt some green-painted tubewells probably should be re-tested. They expressed an interest in helping with any future mitigation efforts.

> One college teacher who worked for DCH as a tubewell tester for five months tested and painted an arsenic-contaminated tubewell at the Dewanbagh Mosque in Malkhanagar Union. Seeing their tubewell painted red, the mosque committee became furious and changed the color of the tubewell head to green. They argued that since it is a Pir Mosque, it is impossible that the water could be affected by arsenic.
>
> -- April 2003 field report

Reactions to Arsenic-free Water Options

According to the people interviewed by the evaluation team, in most cases women were not much involved in community-level discussions about safe water options. Poor men also were not often included in the discussions. Men participated in the discussions and then talked things over with their other family members. It was not possible to verify this finding for the working area as a whole, but one WHO monitor has made a similar observation. (Sheikh 2002)

Women and men made a variety of different comments about their arsenic problem and about the safe water options. Some were more disturbed by the arsenic problem than others. The great majority prefer the taste of tubewell water and many still consider it to be more pure than other sources. In all study areas the comment was made at least by some: ‘We have been drinking this water for a long time without any adverse reactions, so we don’t believe it’s harmful. Ground water is a gift of God. It’s impossible that it could harm our health.” Some said they did not feel badly about drinking arsenic contaminated water, because no harm had yet resulted. In and around most of the villages randomly visited by the evaluation team, few patients were actually seen.

A number of people expressed dismay, however, that the detection of arsenic in tubewells had completely ‘demolished’ their confidence in their formerly trusted water sources. Many women expressed concern and pain that they could not ensure that the water sources consumed by their families, especially their children, were safe. A few claim to have started drinking boiled pond water, but for cooking the majority in Serajdikhan use tubewell water, arsenic-contaminated or not, unless it has too much iron and spoils the taste and color of cooked food. In Bhanga and Muradnagar almost all cook with pond water.

The people in arsenic-affected areas are caught in a dilemma. Even though they have learned that their present sources might harm them, most feel they do not have convenient or suitable alternatives. The first choice in drinking water for the great majority is that from a green-painted tubewell. Second choice is water from a deep

tubewell. Since the initial round of testing, a good number of DTWs have been installed either by DPHE or by rich persons. Some others were installed by competing candidates during the recent union parishad election campaign. Other options, such as pond water, rain water, and dug wells, are not new to them; but the population has been rather thoroughly 'brainwashed' against those kinds of sources during the past three decades. This profound change in drinking water habits is one challenge of the arsenic crisis, as many in the water sector now understand. The unfortunate fact is that, for these and other reasons, most people in the project area continue to drink arsenic-contaminated water. The Bhanga UNO, in trying to convey the poignancy and irony of this situation, was moved to quote an emotional line from a Rabindranath Tagore song: 'I am drinking poison with full consciousness' (*Ami jene shone bis koreshikon.*).

Some women argued vigorously against the new options being offered. They weren't sure whom to believe, whether the arsenic problem is real or not. One woman said, 'Our old family members and we too – we all drank pond water in the past. Then you came and showed us that pond water was not safe. You taught us how it was contaminated with dirty things and bad for our health. Then we installed tubewells and enjoyed drinking that water. Now you are saying the tubewells are "arsenic," and we should drink pond water again. How can we drink that dirty water, which we know is harmful?' Another woman said, 'Tubewell water is tasty, and we can't actually *see* the arsenic. But we easily can see that dirty and thick pond water, which is not possible to drink'.

The majority of people in many areas do not have access to ponds anyway. But those who do prefer to use them for highly profitable fish culture, which requires use of fertilizers not suitable for human consumption. So the PSF option is not especially popular for both economic and aesthetic reasons. The NGOs, therefore, must struggle to meet their stated PSF targets.

In some areas with pond sand filters people have tried to re-accustom themselves to drinking pond water. They said that at first they were offended by the smell, and they felt (in one area) that pond water was too 'cold', or caused cold-related illnesses. But after a few months' practice, they said, some, but not all, had come to like it. A majority of the PSF water users said the water tasted good.

In those villages where the project is not presently offering safe water options, people were found surprisingly ignorant of any developments. Some said they had never been informed about safe water options. This was especially true in the places inhabited mostly by poor people.

Poor People's Point of View

The cost-sharing requirement is making it difficult for poor people to get safe water. According to some reports, the NGOs are not actually able to offer safe options to the very poorest sections of their working areas. One owner of a new RWH unit also said that only the better-off people can afford to pay the Tk.1200 share expected by the project. One poor woman, who was informed about safe water options, bitterly observed that the project is providing safe options at a discount to people who could easily afford to pay the full cost themselves.

> After a group discussion in Chhoto Hamirdi Village, in Bhanga, we met a poor man , a day-laborer, on the earthen road and had a short conversation with him about arsenic and RWH. 'You provided that pitcher', he said, referring to the RWH unit, 'but who could pay a thousand taka for a thing like that? I have no money. Tell me', he asked, 'what would be my fate if you asked me to pay money for water?'
>
> -- April 2003 field report

Many of the poorest people interviewed said that their priority had to be on earning a living and getting enough food.

A very poor woman in Gazipur, Muradnager, uses water from a PSF system. 'I'm getting some arsenic-free water', she said, using the new vocabulary (*arsenik-mukto*) introduced during the project's public education campaign. She then said, 'We used to drink arsenic-contaminated water (*arsenik-jukto*).This is good for our people'.
--April 2003 field report

Arsenic contaminated water was not at the top of their list of concerns. And even those who were worried about arsenic said that they could not afford to 'invest' in safe water instead of food. One poor man, an arsenicosis patient, said, 'We poor have no choice except to die because safe water is not available in this area, and we have no access to either water or money for medical treatments'. Unless they are living in an area where a safe option is being offered, and it is one they can share, the poorest people are the least likely to benefit from this project.

Some poor people claimed, as mentioned above, that the project has not encouraged them to take any options because they have no ability to pay installation charges. In one case a group of poor men and women complained that the owner of a pond with a PSF filter did not allow them to take much water, but in two other cases poor women were found to be very happy with PSF arrangements. (See case studies, below.)

One option that seems to work well for the poor is the re-excavated dug well, because it typically has been abandoned by former zamindars and therefore serves as a community resource[6]. The re-excavation is considerably less expensive than installing new dug wells, which tend to be used only by a few families.

Discussions with Arsenicosis Patients

The evaluation team met with two groups of patients. One was a male group, most of whom worked as agricultural day laborers, living in a village outside the project where another agency (BRDB/P.E.P) is trying to help with the arsenic problem. The other was a female group within the working area. Both groups were residents of Bhanga Upazila. Some were seriously affected. A few patients also were interviewed in Muradnagar. One Serajdikhan man who had been suffering from arsenicosis for eight years had spent five years in a Dhaka hospital and was later shifted to DCH for care. He said he is strictly forbidden to drink tubewell water and must drinks only boiled river water. Another male patient, in Bhanga, had suffered for 20 years with arsenicosis symptoms, although he was identified as a patient only two years ago by DCH. DCH took him to the hospital in Dhaka, and his condition improved somewhat. But he was unable to arrange the Tk. 6000 needed for further treatment, so now he is back home and taking only the regular anti-oxidant

A poor woman of Daniyapara, in Serajdikhan, wife of a van-puller, told us that six of her seven family members are affected by arsenicosis. Many feel very weak, and two daughters have been hospitalized. 'The environment has changed', she said. 'People used to consider this a contagious disease. No one wanted to come to our house. We were socially isolated (*ek ghore*)'. Because of the project doctors' public education efforts, reinforced by messages on TV, all her neighbors learned that arsenicosis is not contagious. 'Now they understand', she said. 'The neighbors come to see us and to find out how we are doing. They touch our hands and check to see if they have symptoms too'.
-- March 2003 field report

[6] A zamindar was given authority during the British colonial period to collect taxes from peasants. A large percentage of the tax revenue was passed on to the British administration, but all zamindars were wealthy and functioned in effect as feudal over-lords. Most of them were Hindu, and a great many fled the region in 1947. Their property was confiscated or occupied by others after they left.

treatment.

The patient group, all of whom were under treatment, as might be expected, were more aware about arsenicosis than the general public. They all seemed to have a practical attitude toward their health problem, and to get strength from the doctors caring from them (or, in the case of WHO, monitoring their progress). It seems that some people are seeking medical treatment and learning to recognize arsenicosis symptoms by meeting currently registered patients. Patients reported that their symptoms slowly reduced once they took medical treatment.

In order to save money on conveyance, patients in Bhanga (both males and females) send one person to the Upazila Health Complex for medicines every month or so. The person carries others' cards and brings back the medicines. The doctors object to this practice, as they wish to examine each patient individually. Poorer patients, including these, all mentioned that 'treatment' – which for them includes travel costs to get treatment and arranging safe water options – is too costly.

Many of those – patients and others -- interviewed in Kamala Village, Muradnagar Upazila, showed unusual signs of panic. Although many RWH units have been installed in the vicinity, the poor feel nothing is being done for them. The people interviewed stressed the importance of doing more patient identification and follow-up treatment. They mentioned one household in which there are ten known patients (mostly women and one 10-year-old boy), but only one who is registered and getting care. Although all have DCH cards, they said, not all are getting care. More than 10 new patients were identified by the WHO doctor accompanying the evaluation team on its visit to Kamala.

One exceptional household in Kamala had eight or nine members affected by arsenicosis. The family had installed a RWH unit, and they were very satisfied with their new safe water source. One man of this family said, 'We feel relaxed now that the project has provided this good rain water. Many people here still drink arsenic-contaminated water'. The RWH was found to be well maintained.

Some people complained about side-effects of the "medication" they receive (which consist of anti-oxidants and salicylic ointment). Two women said they had gone a few times to get treatment but stopped because of side effects, such as dizziness, pressure in the chest, and acidity in the stomach.

Those who are not patients generally have no idea about arsenicosis treatment, what it is or where one can get it. Some just make vague references to various health service providers, but have never checked on this because they do not need to. One school teacher in Sirajdikhan, however, did mention that DCH provides arsenicosis treatment in that area.

The men who were interviewed did not yet have any safe water source, so they were continuing to drink arsenic-contaminated water while a new dug well was being installed in their area. The only safe water source they knew of was 2–3 km. away, requiring a Tk.5 van trip to bring a pot of water. The women all claimed to be drinking safe water from a deep tubewell installed in their area by DPHE. The women said they cook with pond water and bathe in ponds, but they consider pond water far too putrid to drink.

Social Ostracism of Arsenicosis Patients

Patients and others discussed the continuing problem of social stigma. The mass media emphasize that arsenicosis is neither contagious nor hereditary, and there are important signs that people's understanding is improving. However, both men and women with the condition still do face social problems, especially when it comes to finding marriage partners. Some try to keep the problem a secret. One Muradnagar patient's mother does not tell her neighbors or acquaintances that her daughter is affected. One

Bhanga father urged the doctor to tell no one at all that his adolescent daughter is affected. One woman whose husband was newly diagnosed had been warned by some other women not to tell anyone; this family owns a pond with a PSF unit installed.

Relatives of arsenicosis patients are very likely to have problems arranging marriages for them. The brother of a young Bhanga boy patient said that the boy would probably have a problem finding a wife when the time comes. The parents of two afflicted adolescent girls in Serajdikhan are finding it impossible to get husbands for them.

Case Study No. 1: A Functioning PSF System

One good PSF has been installed in Gazipur Village, Bhanga Upazila. It is well constructed and nicely maintained by a young male caretaker. The pond is large, and it is protected. Pond ownership is distributed among a group of well-to-do families, many of whose members live in Dhaka or have migrated overseas. The wealthy people paid on their own but allow others to use the water. Although the PSF was installed near one of the owners' homes, all others, including many poor people, easily come to take water without facing social difficulty or having to spend any money. This PSF has made safe water convenient to all. Formerly people had to take water from a distant tubewell.

Although the evaluation team found three dead flies in the filter chamber, we were told by BRAC staff that there is no need to come for any repairs, because the committee and the caretaker have all necessary technical knowledge of how to maintain the PSF.

Case No. 2: PSF Users Share Costs

In Dhonirampur Village, of Muradnagar Upazila, the initial cost of a PSF was shared among all users, with a flexible payment arrangement that cost poor families less than rich ones; and all seem to feel a pride of "ownership." There are no problems of discrimination among users.

Case No. 3: A Problematic PSF

In Manikdi Village, of Bhanga Upazila, a PSF has been installed (about two months before our visit) in a pond owned by some wealthy people. The owners are all relatives who live in the same compound (*bari*). They have two ponds, of which this is the larger and better one, although it does not seem as well protected as some others. There are some fish in the pond, but no chemical fertilizer is used. Dead flies were found in the filter chamber. They had flown into the small space, around two inches high, between the tank and its cover.

The village has a section of very poor people, who live along the banks of a canal. Their living area is flooded annually. It was assumed at first that the poor families would have access to the water, but they are harassed in various ways by the families that own the pond. Both men and women from the poorer section complained of being insulted when they tried to get water. They are mocked because their water pots are made of clay. One owner suggested that only people with 'silver pots' would be allowed to take water from the PSF. The poorer families are reminded that they do not own the pond, and they are instructed to take no more than one pot of water. So the poor people are giving up and will not use it anymore, they say; rather, they will go back to using the arsenic-contaminated tubewells.

Case No. 4: Some Re-excavated Dug Wells in Bhanga

Two re-excavated dug wells have been observed in Jhumurkanda and Dhoair Villages, of Bhanga Upazila. Both had been installed more than 100 years earlier, according to local people. The people said they used the wells long ago, and now they are drinking water from them once again. The Dhoair well, kept inside a house compound, is better cared for than the other, which is next to a road. The Jhumurkanda well has insufficient water in summer, so this causes problems for users. The height of each well head has been increased, and they both have sturdy steel covers. Water is drawn up with hand pumps. The construction work seems to have been carefully done. A great many people are using both of these wells.

Case No. 5: Rain Water Harvesting Unit Observations

In Muradnagar the evaluation team visited 10 RWH water points that had been installed within the past five or six months. Some others, more recently constructed (around one to three months ago) were observed in Serajdikhan. Three are not yet operating, for lack of rain. Many Muradnagar RWH units were installed in one village area (*para*); and after installation all owners were invited to a workshop to get operational training. Four of the functioning units were said to have good quality water, but three had less flow. At least one had a broken pipe, and in two the tank was not adequately protected; so the water was dirty and full of insects.

The evaluation team observed that the majority of people do not yet understand this technology very well. Its mechanical principles are not familiar, and procedures are not always followed. For example, it is necessary to block the pipe into the reservoir when it first rains, and to open another (for around five minutes in heavy rain or longer if not heavy), which allows dirty water to run off the roof. People were said often to not wait long enough before re-opening the main pipe, and thus to allow dirty water to flow into their RWH tanks.

Some pipes seemed too weak to withstand the water pressure and had cracked; one was repaired with a piece of tape. Some of the owners of malfunctioning units complained that no one had come to check on how they were working after initial installation. The NGO representative said it was not possible, given present staffing levels, to follow up on such a huge number of newly installed water sources. So construction quality control is suffering.

These observations show that it is important to follow up for some time and help people learn how to maintain RWH units. Not all were equally good at maintaining them.

8: Conclusions

The scale of the arsenic problem in these three upazilas is daunting. The staffing and pace of program operations are not likely to provide safe options to a large percentage of the affected populations before the project ends, although many demonstration or pilot efforts are under way that offer learning opportunities to guide future programming elsewhere.

Three critical challenges are: 1) achieving a higher degree of consensus and coordination among concerned agencies; 2) creating alternative and affordable safe water options on a sufficient scale to reduce public health risks; and 3) facilitating the development of a functional system to identify new patients and provide satisfactory treatment and continuity of care for existing patients. In these three upazilas alone almost a million people are at risk of arsenicosis. Urgent questions persist: How are they to be helped? How long will it take to get the job done?

The arsenic problem-solving approach is suffering from the lack of a broad planning mechanism. This report has discussed planning and coordination issues identified at both national and upazila levels. The policy framework is more or less developed and supportive of arsenic mitigation efforts. The most urgent national issues are: (1) difficulties in coordinating the work of several line agencies, especially those in the Ministry of Health and Family Welfare, on the one hand, and the Ministry of Local Government, on the other; and (2) the slow pace of approval of some community-based alternative safe water options, such as the Sidko Plant.

The continuing enthusiasm for DTW's is interfering with local efforts of this project to promote surface water use, rain water harvesting, and dug wells.

Like other arsenic mitigation projects, this one utilizes NGOs to do community-level work in partnership with DPHE, as the primary responsible government agency. This type of arrangement is accepted by policy makers and others as normal nowadays, but there are some pitfalls. In the three-upazila Project coordination between NGOs and governmental agencies has been good in some ways but not in others. A specific problem has arisen in the case of the Upazila Health Complex (UHC) in Sirajdikhan relinquishing responsibility for identification and care of arsenicosis patients, since the non-governmental health service provider, DCH, has been identified as the local agency with the needed expertise. In the other two upazilas (and elsewhere in the UNICEF-managed areas), however, the UHC's roles and responsibilities in arsenicosis treatment have been clarified and strengthened thanks to this project's activities.

Monitoring and documentation are urgently needed, to learn from this experience. Aside from spot-checks by consultants and staff in WHO and UNICEF offices and statistical reports from NGOs, the monitoring system is not yet organized in a way that the total arsenic situation – its social and physical aspects – can be assessed and understood. People have all sorts of reactions to the information that their trusted tubewell water is not actually safe. These need to be carefully understood, in order to refine communication and get as much information as possible out to the affected public.

Broadened water quality testing is one important effort promoted through this project, and sorely needed training of health service providers is moving forward apace.

Existing research studies, relating to clinical issues, are useful; but more study is needed of the social aspect of the arsenic problem.

Upazila Level Issues

The UNO's involvement is all-important. An energetic and interested UNO can activate upazila-level officers of all governmental departments and also draw support from elected local government representatives. An uninterested one can hamper coordination.

Sub-Assistant Engineers of DPHE are recognized as key persons in the water sector, including UNOs and contractor NGOs. The NGOs in general keep them informed of project activities. And in some areas the SAEs have been helpful with training, tubewell screening, and monitoring NGOs' work. The typical SAE, however, is not equipped with sufficient manpower, logistics, or even authority to provide strong support to the project at the upazila level.

With very few exceptions, the evaluation team found people in general – including UNOs and DPHE staff – still to consider green-painted shallow tubewells or deep tubewells as the only safe water options. The need or feasibility of non-tubewell options was not even *theoretically* established in the minds of government officials and others whom the evaluation team met. This lack of awareness at high levels needs attention from the project.

Systematic information on each upazila's arsenic situation is not widely disseminated, despite the fact that the project has generated some valuable information and has presented it in an interesting and easily accessible format. The CEGIS maps, for example, were seen in the Serajdikhan NGO's office but not elsewhere. Lack of broad use of this information in any locally managed, indicator-based planning or monitoring process is limiting its value as a planning tool.

Any project willing to provide arsenic free water will find it difficult to succeed if lateral communication and knowledge sharing is not strengthened. Such sharing also would be helpful with coordination of different organizations' efforts. It also would encourage dissemination of information about arsenic to the common people.

There is scope for improvement at the upazila level: specifically

- Energizing of the Serajdikhan UNO
- Engaging Upazila Health Officers in Muradnagar and Serajdikhan
- Training of Medical Officers still may be needed in some or all of the three upazilas (as part of a batch of 15), and possibly also refresher training of Health/Family Welfare Assistants.
- Defining clear roles for *all* upazila-level officers (not just DPHE and DGHS) in promoting awareness of the arsenic problem and helping people to get safe water, health care.
- Establishing a stronger sense of upazila "ownership" of the problem/solutions, rather than keeping the upazila dependent on the project. Evidence of this problem was that there were no Upazila Arsenic Mitigation Committee meetings during a lapse in 2002 project funding.

Community Level Findings

There has not been sufficient continuity/flow of services between the screening/education phase and the mitigation phase activities in most places. This has upset and confused many people.

Public awareness of the arsenic problem has definitely improved as a result of this project's first year of public awareness-raising activities – especially in combination with reinforcing messages from mass media. Arsenicosis patients were found to be even more knowledgeable about arsenic than others. Perceptions of safe water options are complicated. People still greatly prefer their familiar hand tubewell water over the new options being offered, but they are becoming accustomed to new ideas gradually. Relative scarcity of arsenicosis patients reduces fear.

The large number of testers recruited to do tubewell screening in the project's first year are still interested in the arsenic problem, but they have been abandoned by the project. They are finding it difficult to answer questions their neighbors ask of them, as they are not kept up to date on project activities and options. Some expressed embarrassment at not being able to fulfill their commitments to serve as community information resources.

Alternative safe water options are being given only in selected, highly affected areas. The evaluation team found people in other areas considering only green-painted hand tubewells or deep tubewells to be sources of safe water. In areas where red-painted tubewells are pervasive, people talk mostly about getting deep tubewells from the government. Those who can afford to do so talk about drilling a deep tubewells at their own expense.

Poor people are very concerned about the project's cost-sharing requirement. They observed in several places that more affluent people somehow are more able to get safe water than they are. For example, if a safe source is very far away, the poor in one Bhanga village claimed that they did not have enough energy to go themselves, whereas the more well-off people did so. Several commented that rather than pay for water, they would go on drinking from arsenic-contaminated sources, since they have never had to pay before.

Poor people are not easily welcomed into meetings where arsenic issues are discussed. One woman, for example, said she was not comfortable talking with teachers, union parishad members, and so on. It's a novel idea to *include* poor people in local decision-making processes.

The quality of local leadership (a factor not within the control of any externally initiated project) is probably more important than the attitudes and actions of the contracted NGOs. The evaluation team found differences in the degree to which local leadership recognized the needs of the poor. In some places they had a charitable attitude, but in others they did not.

Patient Identification: Gaps in the System

There is no effective system in place at the moment to identify new patients and refer them to treatment. Except for DCH, the NGOs presently engaged in water options provision activities do not see other health related activities as part of their job.

The general distribution of patient lists in some places, as discussed in the section on upazila issues, violates norms of patient confidentiality, as UNICEF and WHO project managers are well aware. It is especially unwise in a country where arsenicosis patients tend to be socially stigmatized. Though expressly forbidden, it unfortunately continues in some places.

Safe Water Options

The project has provided very little in the way of safe water options because of (a) governmental constraints and limitations on options; and (b) the small scale of this

project's staffing relative to need. Some important experiments are under way in a few places, but population coverage is still minimal.

Acceptors of non-tubewell options, especially RWH units, are still waiting to see how well they work. The evaluation team found many RWH users to have difficulty understanding and properly using the technology. Follow-up technical assistance is not as available as it should be.

Re-excavated dug wells (provided only in Bhanga at this time) tend to be more accessible to poor people than new dug wells, because the re-excavated dug wells are mostly abandoned by former zamindars, and they therefore serve as community resources. The re-excavation is considerably less expensive than installing new wells, which tend to be used only by a few families.

Pond sand filters can work well for poor people, if the pond owners are willing to share their ponds with them. This option, however, is extremely difficult to arrange because of the social negotiations and loss of fish culture opportunities.

A general consensus on safe water options among all actors – governmental, non-governmental, or private – is essential for sustained improvement of water quality in arsenic affected areas such as these three upazilas.

Capacity Building

In the long run it will be necessary for the Government of Bangladesh to shoulder full responsibility for solving the arsenic problem; but NGOs and the general public also have a clear role to play. At present things are somewhat confused, with NGOs in some areas conducting activities (such as patient identification or public education) in an uncoordinated way without adequate involvement of government officials. Formal partnerships, or contracting out some part of the work to NGOs, save money but in the long run may contribute to confusion if government does not assume ultimate responsibility for what is done.

This project's capacity-building goal is a sincere one, but it is not as systematically integrated in all project activities as it might be. There are logical reasons for this. The three-upazila Project, like UNICEF arsenic mitigation programs, is facing a dilemma: whether to devote resources to strengthening governmental and community-level understanding about arsenic and developing sustainable institutions to make decisions, on the one hand, *or* whether to speed up efforts to provide safe water to the affected public, on the other. These two needs are not entirely compatible in the present context, and all stakeholders grapple with them daily.

The emphasis in the present arsenic mitigation phase is more on provision of safe water options, and on handling related technical and social complications, than on building decision-making capacity at the community level. This work alone seems to absorb all the energy of contractor NGOs. In two of the three upazilas, nonetheless, the formation and (more or less) regular functioning of UAMCs does represent an improvement in capacity and serves a useful purpose in disseminating knowledge.

Village/Ward-level arsenic committees are rarely (if ever) functioning, but union parishad members get information from upazila meetings. The evaluation team found NGOs to be complying project requirements by reporting on informal local discussions as "village arsenic mitigation committee meetings."

People form committees to manage certain options, especially PSF's. In Serajdikhan some tests are being done regarding dug wells, and a user/owner committee has been formed. But the contracting NGO is doing most of the technical decision making. The need for special village-level arsenic committees in all places is not clear to this evaluation team.

9: Recommendations

a. Government and the NGO systems should strive for more common understanding, consensus, and provide coherent messages to the public. There is now some disagreement about deep tubewells, for example. Not enough governmental officers are thinking about the possibility of making more use of dug wells, surface water, rain water, and so on. The reasons behind the ban on blanket installation of DTW's should be "de-mystified" and broadly explained to all concerned professionals.

b. Improve monitoring of project activities. Do this by engaging a specialized monitoring agency to conduct regular and systematic field-level investigations of NGOs' activities, according to certain indicators. Periodic operational and financial audits would be appropriate. There is significant scope for development of community-based monitoring systems – using social maps and other easily understood graphics – to help people track their own progress in solving the arsenic problem.

c. Each upazila needs a clear and comprehensive plan to cope with its arsenic problem. All agencies working, or planning to work, on the arsenic problem should be included in developing such a plan.

d. Dhaka project managers, including those from WHO and UNICEF, should meet with UNOs of all three upazilas whenever they visit the field, in order to engage their interest in facilitating the development of such a plan. This mobilization effort should not be left entirely to contractor-NGOs.

e. Each upazila may consider forming a "think tank" or committee that will review and analyze safe water options being tried out there. The experiences of various organizations should be shared and compared. The United Nations Foundation funds could help to develop a suitable arrangement, supported with needed information, in each of the three upazilas. If this is done, the nature of the group should not be very bureaucratic or formal. The existing Upazila Arsenic Mitigation Committees, though useful, are not entirely suitable to the informal communication process that would make such an effort successful.

f. Publish a bulletin or newsletter to disseminate knowledge and learning from the project. Share it with the arsenic crisis website.

g. Newly elected union parishad chairmen and members need some orientation to the arsenic issue and the organization of this Project.

h. Perhaps some rich people here and there could be motivated to sponsor some alternative options other than deep tubewells at their own expense, to increase public awareness of the alternatives and expand the number of publicly visible demonstration models beyond what the project can presently provide.

i. There are important, unexploited local resources which could be mobilized: abandoned/derelict ponds, for example, might be suitable for installation of PSF systems. More use could be made of abandoned wells for re-excavation.

j. The trained tubewell testers have some basic technical knowledge. More use could be made of them as volunteers (paid or unpaid), to facilitate community planning and disseminate knowledge.

k. Develop some procedures that will allow hard core poor to gain access to safe water options through the project. Possible ways to do this would be: offering RWH units for two households to share; or subsidizing costs of dug wells, which are a good community option. Special meetings in poor communities could help to identify derelict ponds or other low-cost water options worthy of development. The government-mandated, uniform cost share requirement is not fair, as it generally provides safe water options at prices that are too low for the rich and too high for the poor.

l. Patient numbers are likely to increase in the future. So there is an urgent need for continual monitoring, so that new patients can be identified and helped. There should be an increased effort to train local people, including the union health assistants, pharmacists, or quack doctors, to refer possible patients. Upazilla Health Complexes should become the main health facilitiy for diagnosis and management. There is a need for better coordination arrangements between any agency that identifies arsenicosis patients and health service providers.

m. Patient lists should be available to every upazila health complex (which they are not), and they should be considered *strictly confidential*. There should be no copies in the non-medical NGOs' offices.

n. Considering limitations on resources, the Project's decision to prioritize places with more than 80 percent affected tubewells or with large numbers of arsenicosis patients is an appropriate choice.

o. In the other places, those not receiving intensive attention, a phased approach to safe water use, such as using rain water during the rainy season, may be the only practicable approach, at this time. An option need not entirely replace the existing contaminated water source. Any amount of safe water is helpful. This concept may be especially helpful to the poor.

p. All NGO project implementers should be trained in PRA methods of helping communities to understand and assess safe water options.

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Annexes

1: Terms of Reference

2: Places visited by the evaluation team

3: Partial list of people interviewed

4: Government order establishing Arsenic Mitigation Committees

Annex 1: Midterm Evaluation Terms of Reference

Based on the WHO – UNF/UNFIP – UNICEF Project Document, and through consultation with stakeholders at community, union, upazilla and national level, the evaluation will assess a range of issues relating to the successful implementation of the project activities and how this is contributing to the development of a replicable model for arsenic mitigation response. The effectiveness in communication for mutual information exchange and capacity building between the project and the wider arsenic sector in Bangladesh will also be reviewed.

More specifically the mid-term evaluation will consider progress made so far in achieving project objectives, in terms of the numbers mentioned in the project document, but even more so with respect to

- the processes and procedures that have been followed to engender local capacity in ensuring a sustained reduction of exposure to arsenic by individual households and communities;
- ownership of the development process created at the village, union and upazilla level, especially with respect to empowerment of households and community, local government and local NGOs;
- use, functioning and sustainability of the technical options selected, within their operational setting;
- what institutional efforts at various levels have been put in place to facilitate the local empowerment, and
- the initial information and guidance which applied research and monitoring have generated, in particular related to understanding and risk of continued exposure to arsenic due to non-use, and/or the risks due to risk-substitution caused by alternative sources, with respect to public health; and application of diagnostic tools for patient identification.

The mid-term evaluation will further consider relevant aspects at three levels of operation:

Community Level

- Organizational and institutional aspects relating to owning the problem and the solution
- Availability of alternative water supply solutions through the public or private sector, including NGOs, or through self management
- Water quality testing and surveillance issues: now and in the future

- Adequacy and self-sufficiency of household & community managed solutions
- Identification and management of patients after the initial round of screening

Upazila Level

Same issues as above, but with a stronger focus on the delivery mechanism that is gradually to be in place: i.e. the effectiveness of Upazila Arsenic Management Committee and the associated cooperation between Local Government, Department of Public Health Engineering and the Directorate General of Health Services.

National Level

What is the contribution to national capacity building of the UNF/UNICEF-WHO project in terms of

- choice of technology/environmental technology verification issues
- considerations of sustainability/durability of the water supply option
- water quality surveillance and source protection
- diagnosis and management of arsenicosis patients
- applied and field research in health aspects of arsenicosis

Annex 2:
Places Visited by the Evaluation Team

Dates/Upazila	Locations	Interviews/ Observations	Comments
25 March 2003/ Serajdikhan	Upazila headquarters town	-DCH Upazila coordinator	Three team members visited
	Malopdia Village, Moddhopara Union	-Female group discussion -Visited 5-6 houses -Rich family with own DTW -Group using DTW in market place	
	Daniyapara, near Upazila DCH office	-RWH unit under construction by family with 6 arsenic patients (out of 7 total)	
29-30 March/ Muradnagar	Upazila headquarters town	-Grameen Shikkha Coordinator -Upazila Health Officer & Medical Officer responsible for arsenic	Three team members visited
	Dhonirampur Village/Union	-PSF owner, & users' group discussion -People drinking arsenic-contaminated water: group discussion -Newly elected U.P. Chairman	
4-6 April/Bhanga	Upazila headquarters town	-UNO -DPHE-SAE -Upazila Health Officer -BRAC Upazila Project Manager	Two team members visited
	Chhotohamirdi Village, in Hamirdi Union	-Group of neighbors of one household with RWH unit -Owner of RWH unit -Former U.P. Member	
	Manikdi village, Chanda Union	-PSF user group: FGD with men -PSF committee: informal discussion -Mixed group discussion: poor people (Males, Females) -In-depth interviews with women (3 poor, 2 not poor)	

Dates/Upazila	Locations	Interviews/ Observations	Comments
	Panchkul Village, Chanda Union	-FGD with men drinking arsenic-contaminated water -Former U.P. Member	
Bhanga, cntd.	Gozaria Village	-FGD with female arsenicosis patients -DTW owner(male)	
	Chanda Union Parishad Office	Newly elected U.P. Chairman	
	Jhumurkanda Village & Dhoair Village	-Observed: 2 renovated dug wells -Group discussion with women using dug well	
	Baroi Bhanga Village	FGD with male patients	P.E.P./BRDB working area; not inside project area
6-8 April/ Serajdikhan	Upazila Headquarters Town	Interview with DCH UNO DPHE Other NGO Personnel UP member, Political & other people	Two team members visited
	Daniyapara Village, Rashunia Union	Interview with patient observation of RWH	
	Baherghata Village Bairagadi Union	FGD with female group Interview with teacher, Present female UP member, general people & Imam	
	Taltola Village, Malkhanagar Union	Interview with former worker	
	Nateshwar para, Malkhanagar Union	FGD with Male group interview with Ex. Member Observation of RWH	
	Icchapura Union, Icchapura Village	Interview with former worker & Thana health Officer	
	Kusumpur Village, Icchapura Union	FGD with female group and Interview with former worker, Imam and general people	
8-10 April/ Muradnagar	Muradnagar Upazila Headquarters Town	UNO DPHE-SAE Resident Medical Officer Grameen Shikkha representative Group discussion with women taking arsenic-affected water from DPHE tubewell	Two team members visited

Dates/Upazila	Locations	Interviews/ Observations	Comments
	Gazipur Village, Akopur Union	-Former U.P. Chairman -FGD with males -PSF observation -Two group discussions with women (poor/not poor) -In-depth inerview with poor family taking water from PSF -In-depth interview with rich family that paid entirely for PSF -General discussions about perceptions of technical options	
	Kamala Village	-Observed 10 RWH units -Group discussion with women -Discussion with newly identified patients	
1-9 April	Dhaka	Key Informant Interviews	Names on Contact List

Annex 3:
Partial List of Persons Interviewed

Dhaka

Abdul Quader Choudhury

Project Director, Environmental Sanitation Hygiene and Water Supply Project, DPHE

Md. Abdul Zahed

Program Coordinator (Arsenic), Grameen Shikkha

Abu Shahjalal Azad

Consultant, Water and Environmental Sanitation, UNICEF

H.K. Banik

Coordinator, 8 Upazilas, Community Based Arsenic Mitigation Project, DPHE

Sara Bennett

West Bengal and Bangladesh Arsenic Crisis Information Centre: http://bicn.com/acic/ (or) arsenic-crisis@yahoogroups.com

Colin Davis

Chief, Water and Environmental Sanitation, UNICEF

Farida Shaikh

Sociologist-Consultant, World Health Organization

Han A. Heijnen

Environmental Health Advisor, World Health Organization

Ihtishamul Hoque

Executive Engineer, DPHE

Md. Jabed Yousuf

Acting Director, Project, Dhaka Community Hospital

Md. Jakariya

Coordinator, Environment Group, Research & Evaluation Division, BRAC

Kamal Uddin Ahmed

Project Director, Bangladesh Arsenic Mitigation Water Supply Project (BAMSWP)

A.F.M. Khalid Hassan

Project Officer, World Health Organization

Nurjahan Begum

Managing Director, Grameen Shikkha

Ranjit Kumar Dey

Director of Planning and Research, Directorate General of Health Services

Jan-Willem Rosenboom

Project Officer, Water and Environmental Sanitation, UNICEF

Saima Khan

Asst Project Officer, Arsenic, H&N, UNICEF

Salamat Khandker

Medical Officer, World Health Organization

Shafiqul Islam

Team Leader, Arsenic Unit, Water & Environmental Sanitation, UNICEF

Shah Noor Mahmud

Sector Specialist, Arsenic, BDP-BRAC Health Program

Siddiqui Rahman

Deputy Project Manager (Arsenic), Directorate General of Health Services

Bhanga Upazila, Faridpur District

Abdul Barek

Subassistant Engineer, DPHE, Bhanga

Bidyut Ch. Mistry

Upazila Coordinator (Arsenic), BRAC-BDP, Bhanga

Dr. A.K.M. Sakawat Hossain

Upazila Health Officer, Bhanga

Shahadt Hussein

Upazila Nirbahi Officer, Bhanga (interviewed in Dhaka)

Golam Kibriya

U.P. Chairman (newly elected), Chanda Union

Muradnagar Upazila, Comilla District

Mr. Farid Uddin Ahmed

Upazila Manager, Grameen Shikhha

Abdul Zahed

Grameen Shikkha Program Coordinator

Mr. Arun Udday Majumdar

SAE, DPHE

Mr. Abdul Matin

Medical Officer, Upazila Health Complex

Khan Md. Belal

Upazila Nirbahi Officer

Serajdikhan Upazila, Munshigonj District

Mr. Shafiqul Islam Shohag

Upazila Manager, Dhaka Community Hospital

Mr. Shubash Chandra Paul

Supervisor, Dhaka Community Hospital

Mr. Chowdhury Ishkanadr Anwar

Upazila Nirbahi Officer

Dr. Md. Nagib

Upazila Health & Family Planning Officer

Mr. Shahinur Islam

Technical Marketing Officer, International Development Enterprise (IDE)

Ms. Sumi Begum

Member, Bairagadi Union parisad

Ms. Laxmi Rani Datta

Teacher, Bairagadi Govt. Primary School

Mr. Nikhil Kumer Barmon

Teacher, Bairagadi Govt. Primary School

Mr. Abdur Rashid

Associate Area Coordinator, Proshika

Mr. Abdus Sattar Bepari

Ex- Member, Malkhanagor Union

Mr. Pronay Sankor

Ex- Tester, Malkhaanagor Union

Maulana Hossian Ahamed

Imam, South Kusumpur Jame Mosque, Icchapura Union

Md. Mojibur Rahman

Imam, Jahangir Chairman Home (Bari) Mosque, Bairagadi Union

Mr. Omar Ali Mia

Ex- Member, Madhapara Union

Mr. Md. Zahangir Khan Babbul

Former Tester, DCH

Mr. Delwar Hossain

President, Upazilla Jubo dal (BNP)

Mr. Tofazzal Hossain

Office Assistant, DPHE

Mr. Nihar Ranjan Roy

Manager, Grameen Bank

Mr. Jiban Paul

Deputy Manager, Munsiganj

Ms. Kusum Hosian Eiti

Ex. Tester, Icchapura Union

Ms. Sabina Sultana

Ex. Tester, Icchapura Union

Annex 4: Government Order Establishing Arsenic Mitigation Committees

The following is an English translation from the original Bengali November 2000 Government Order establishing arsenic mitigation committees at each administrative level. It is provided here to clarify the Government's original concept of the arsenic mitigation committees' composition and functions.

Letter issued by: People's Republic of Bangladesh, Cabinet Division, District Administration 4th Branch
Date: 30 Nov. 2000 (Bengali date: 16-08-1407/B)

NOTIFICATION

To solve the arsenic problems in the country, action research project has been started. In first phase activities included survey work, patient identification, committee formation at different levels: ward, union, upazila, district, [to promote] mitigation activities.

1) At Ward Level Arsenic Mitigation Committee

1) Woman Ward Member: Advisor
2) Ward Member: President
3) Health Worker: Member
4) Block Supervisor [DAE]: Member
5) Ansar VDP: Member
6) Imam: Member
7) Freedom Fighter: Member
8) Teacher Representative: Member

Activities of this committee will be: This committee will select a Member Secretary from among the members. If needed, they can include two more members in the committee [meaning: some prominent local persons].

This committee will help:

a) To help the people to identify patients & to survey family tubewells
b) Select the time for training of the local workers who will do tubewell screening
c) After completion of the training, the committee will implement tubewell testing and patient identification activities
d) Conduct awareness campaign about arsenic contamination of the water
e) Arrange mitigation options for their villages in arsenic contaminated areas
f) Miscellaneous other works.

2) Union-level Arsenic Mitigation Committee

Members:

1) UP Chairman: President
2) All women Members: Members (3)
3) All UP Members: Members (9)
4) Assistant Health Inspector: Member
5) Family Planning Inspector: Member
6) Teacher Representative: Member
7) Ansar VDP Leader
8) Freedom Fighter (1)
9) Secretary of UP: Member Secretary

An additional two members may be included, if needed.

Activities of this committee:

a) Organize to fund the ward-level committees and supervise them
b) Plan to survey ward-wise and implement activities
c) Help the ward committee to mitigate the arsenic problem
d) Coordinate with the upazila-level arsenic mitigation committee
e) Any other miscellaneous activities needed.

3) Upazila Arsenic Mitigation Committee

Members

1) UNO: President
2) All UP Chairmen: Members
3) Health and Family Planning Officer: Member
4) Uz Agricultural Officer: Member
5) Uz Statistical Officer
6) Uz Education Officer
7) Social Welfare Officer
8) Ansar/VDP, Uz Officer
9) Teachers Representatives (2 - one male, one female)
10) Freedom Fighter (1)
11) DPHE SAE: Member Secretary

If this committee wishes, two additional members may be included from those persons who are very renowned at the upazila level.

Functions

a) This committee will ensure the arsenic mitigation committees at ward and union levels: follow-up on them, [be sure they exist, etc]
b) All types of support will be provided to the union-level committee for mitigation of arsenic problem
c) This committee will coordinate and monitor the union-level arsenic committees
d) They will coordinate with the district-level arsenic mitigation committee.
e) Miscellaneous other works.

4) District Level Arsenic Mitigation Committee

Members:

1) DC: President
2) Police Superintendent: Member
3) Civil Surgeon: Member
4) Deputy Director, Agriculture Department: Member
5) Executive Engineer, LGRD: Member
6) Deputy Director, Social Welfare Department
7) Zila Information Officer: Member
8) Zila Statistical Officer
9) Zila Education Officer
10) Zila Ansar/VDP Officer
11) All pourashava chairmen under the district
12) All UNO's under the district
13) Zila Women's Affairs Officer
14) Teachers Representatives (2)
15) Freedom Fighter (1)
16) Executive Engineer, DPHE: Member Secretary

Two additional members, one male and one female, can also be included. The District Educational Officer will select the two teachers representatives. The Freedom Fighter will be recruited by the District Freedom Fighter Commander.

Functions

a) This district level committee will ensure that arsenic mitigation committees at the upazila level are formed by all UNOs.

b) This committee will coordinate and organize arsenic mitigation activities. It will decide what activities are to be done.

c) They will coordinate and monitor all arsenic related activities

d) They will perform and implement all related activities.

1. The above committees will meet together when needed.
2. For implementation of survey activities, all the committees will follow the guidelines prepared by Arsenic Mitigation and Water Supply Project.
3. This decision will come into effect.

Signed by: Md. Abdus Sattar, Joint Secretary