AVERTING ARSENIC HAZARD : COMMUNICATION CAMPAIGN

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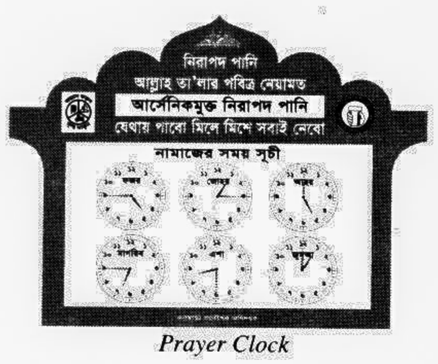
D. Gender and Social Issues Package:

The idea of this package is to promote community sharing of water from a safe water source and inspire men to participate in water collection and management activities with women.

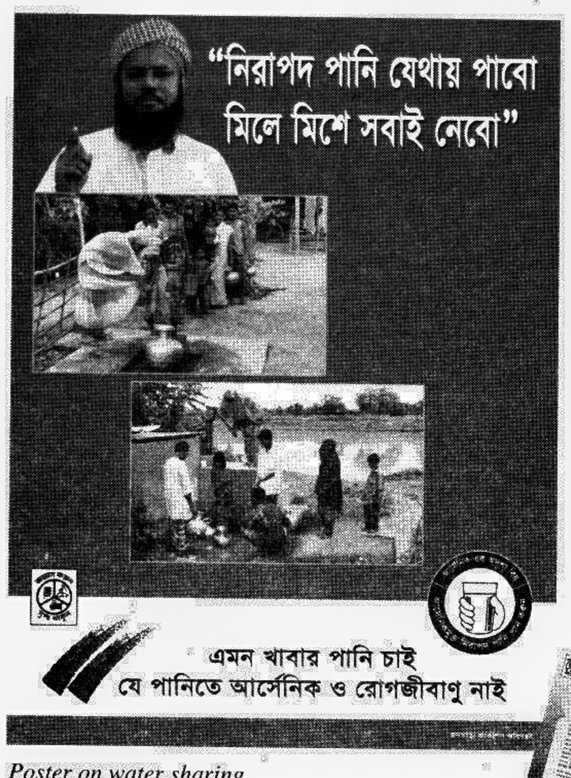
Materials:

1. Two TV spots addressed by an Imam and a couple on water sharing and work load sharing respectively
2. Two Radio spots on similar issues
3. A Poster on water sharing (with the Imam as role model)
4. A hoarding on water sharing (with the Imam as role model)
5. A Prayer Clock with a covering letter for Imams



Prayer Clock

Hoarding on water sharing



Poster on water sharing

letter for Imams

VII. CONCLUSION:

All the materials were extensively pre-tested among the target audience. These were also endorsed by all the stake holders and different committees involved in arsenic mitigation activities. It is hoped that this communication campaign will help raise awareness level with respect to arsenic and also help bring about desired attitudinal and behavioral shifts in water consumption.

ASIATIC MCL (Social)

Arsenic Contamination in Bangladesh

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of the "reduction" of arsenic containing iron-oxyhydroxide which are coated on mineral grains. This occurs in an environment where water contains low levels of dissolved oxygen. This is strongly supported by the findings of the Ground Water Study in Bangladesh conducted by the British Geological Survey. Earlier some scientists expressed the suspicion that the "oxidation" of arsenic-rich pyrites, due to excessive pumping of ground water and hence the exposure of pyrites to oxygen, might be the cause for arsenic release. This is, however, no longer considered a serious possibility. This is evidenced by the conspicuous absence of sulphates in the ground water of Bangladesh, which are produced during the oxidation of pyrites.

Health Effects

Early symptoms of arsenic poisoning include skin lesions; dark spots on hands, palms and bottoms of feet; and hardening of skins into nodules. These signs of arsenic toxicity become visible due to accumulation of arsenic in the body after 5-10 years of continuous drinking of water above the permissible level. Over time, internal organs (including liver, kidneys and lungs) may be affected. Prolonged exposure may lead to cancer of skin, internal organs and limbs.

The epidemiology of arsenicosis is, however, far from being properly understood. According to the Ministry of Health and Family Welfare, 7,000 cases of arsenicosis have so far been identified. In the survey by the Ministry of Health and Family Welfare and Dhaka Community Hospital in 500 arsenic-affected villages (where 64% of the tubewells are contaminated), 1,424 patients out of a total population of 405,232 were identified, indicating an average of 3.5 patients per 1000. But there is not yet enough known about how people are affected and to what degree there are other factors involved, such as nutrition, and prior infection by diseases such as hepatitis. It has been observed that even if members of a family or a community are all drinking water from the same source of contaminated water, only a proportion seem to be affected.

No known medicine has been found so far to cure arsenicosis. Chelating agents have not yet shown therapeutic effects. Antibiotic skin ointments may be used for cracked skins to stop infection. If detected early, localized skin cancer may be cured by surgical excisions. So far, the best known measure to fight against arsenicosis is to drink water that does not contain dangerous levels of arsenic.

Safe Water Supply Options

The first step in safe water supply is to **test for arsenic in all existing tubewells and identify which ones are "safe" for drinking.** This is a major effort, considering the existence of about 4-5 million tubewells in the country. As many as 7 out of every 10 existing tubewells are likely to be "safe". In this connection, the national arsenic screening programme under the Bangladesh Arsenic Mitigation - Water Supply Project (BAMWSP), supported by the World Bank and Swiss Agency for Development and Cooperation, has already been launched by the Prime Minister in October 1999, starting first with a pilot effort in 6 thanas. DPHE and UNICEF have initiated a similar programme in 4 thanas (788 villages) in cooperation with BRAC, Dhaka Community Hospital and Grameen Bank. Lessons learned from these pilot efforts will be applied to scale up testing in all the remaining thanas of the country by the end of next year. This action needs to be accelerated, by ensuring proper coordination amongst all concerned Government agencies, NGOs and donors towards a united effort. UNICEF will support a part of the programme in 7 districts. Danida will contribute towards a similar programme in several districts of the Coastal Belt.

In arsenic contaminated areas, alternative options will be needed in order to ensure safe water supply in arsenic affected areas. These options include:

- **Deep Tubewells.** This is a well-established technology in Bangladesh, particularly in the Coastal Belt. The hydro-geological investigation by the British Geological Survey shows that more than 95% of existing deep tubewells, below 200 metres, are "safe". DPHE's exploratory boreholes programme, supported by UNICEF, indicates that deep aquifers, which could be tapped for drinking water supply, are prevalent in different parts of arsenic affected areas, although not in all places. The technology is, however, relatively expensive and its appropriateness in arsenic affected areas needs to be assessed properly. It is very important to ensure that drilling does not induce arsenic migration into the deep aquifer. Furthermore, the willingness and ability of people to adopt the technology needs to be assessed. Feasibility of human resources development to effectively implement such a programme needs also to be explored.
- **Sand Filtration of Water from "Reserved" Ponds.** In view of the arsenic problem, the Prime Minister has announced that each village must reserve at least one pond that would be used exclusively for drinking. Pond water is mostly free from arsenic, but because of the high levels of contamination due to harmful bacteria, it must pass through a sand filtration process before it could be safe for drinking. The technology has been tried out in the Coastal Belt, with mixed results. The technology is as expensive as the deep tubewell. Its success depends heavily on sufficient community motivation to protect the pond and not use it for fish culture or other household purposes. A strong commitment is also required from the community to have a system in place for proper operation, repair and maintenance.
- **Rainwater Harvesting.** The potential of rainwater as a source for safe drinking is high, given that the country is blessed with at least some rain for nine months out of one year. The popularization of the technology will, however, need to focus on social acceptance and behavioural change that lead to collection, storage and proper use, especially in light of the dry season when rainfall may not be forthcoming for as long as 3-4 months.
- **Ring Wells, Dug Wells.** These constitute indigenous technology that may be revived. The sub-surface water that drains into the well is mostly free from arsenic. The danger lies, however, in the possibility of harmful levels of bacterial contamination due to unsanitary excreta disposal in the community and unacceptable levels of contamination due to heavy use of chemical fertilizers and pesticides for agricultural purposes.
- **Arsenic Removal Systems.** Several technologies are currently being propagated, which claim to be effective in removing arsenic from tubewell water. These are all new and experimental. The effectiveness, viability and sustainability of the technologies under field conditions in Bangladesh must therefore be ascertained before the adoption of the technology and its scaling up.

It is clear from the discussion above that no single technology exists at the moment that is at par with the shallow tubewell that was promoted in the 1970's and 1980's, which proliferated subsequently under private initiatives. Each one has strengths and constraints. The choice of technology will therefore depend on hydrological conditions, as well as on issues of affordability, social acceptance, ease of access, and other factors. Ultimately, it is the decision at the household level that counts. Success will depend on how an enabling environment could be created to help make the choice at that level.

More Than a Technological Response

The response to the public health crisis caused by arsenic contamination of ground water will require a critical component of communication and behavioural change. DPHE is proud that the communication campaign is being launched today with that objective in mind. The multi-media, multi-level communication strategy, which has now been adopted as a national strategy, was developed by a local social marketing agency in close consultation with various stakeholders including Government agencies, NGOs and technical partners and with special support provided by UNICEF. The year-long process relied on in-depth field research, including intensive participatory appraisal with community members and detailed pre-testing. Revisions of communication materials were made with inputs from technical experts as well as feed back from the field. The mass media will start immediately and the inter-personal communication materials will be piloted in the 4 thanas where the community based arsenic mitigation activities are ongoing in collaboration with NGO partners. This will provide the basis for scaling up the activity all over Bangladesh.

In conclusion, the Department of Public Health Engineering, the agency entrusted by the Government to implement rural water supply and sanitation programme, is committed to participate fully in efforts to combat the threat to children and families due to arsenic, pathogens and other environmental pollutants. No single organization or agency alone can, however, solve as massive and complex a challenge as posed by arsenic contamination of ground water in Bangladesh. The response requires the comparative strengths and unique contributions of each and all development partners, including concerned Government line ministries and departments, NGOs, the media and civil scoiety organizations. A good foundation has already been laid to take up urgent action, thanks to the contributions from the Ministry of Local Government, Rural Development and Cooperatives, the Ministry of Health and Family Welfare, and Dhaka Community Hospital, with technical and financial support from UNICEF, UNDP, World Bank, Swiss Agency for Development and Cooperation, Danida, UK Department for International Development, and others.

We all have a collective responsibility to dedicate the resources required and to put on a fast track an effective, well coordinated and appropriate responsive. The children and families of Bangladesh must have safe water to drink. It is a fundamental human right. We all need water to live. The key is for us to act quickly, in partnership and to create solutions that work.

Community-Based Arsenic Mitigation: A Work in Progress

From page 17

action in the future. They are also the areas where the ongoing activities of the three concerned NGOs are quite prominent.

Lessons Learned

The work in progress already shows a number of valuable lessons for future action.

1. Village health workers and community volunteers are capable of testing tubewells and identifying arsenicosis patients. Training was provided by the Dhaka CommunityHospital to the village level workers of all the three organizations. A validation exercise carried out by BRAC shows that there is a good correspondence in the test results conducted by the village workers and their supervisors. Out of 333 tests conducted by both parties on the same samples, variations were observed only in 4.5% cases, well within the realm of acceptable human error.

2. There is no short cut to blanket testing of all tubewells. No pattern in the occurrence of arsenic in ground water is noticeable even in as small a unit as the village. The average percentage of contaminated tubewells in Jhikargacha thana, for example, varies from 37% in Jhikargacha union to 87% in Bankra union. Even within Jhikargacha union, Srirampur village shows a 17% level of contamination, as opposed to Sagarpur village where the level is 99%.

3. Prevalence of arsenicosis patients does not correspond to the percentage of tubewells that contain arsenic above 50ppb. The attached table shows the thana-wide variations. Only one patient with visible signs of arsenicosis could be found in Kachua thana, where 97% of the tubewells are contaminated. In the other three thanas, where the contaminated tubewells are more or less within the same range (55-61%), the number of patients per 10,000 population differs from 3.6 to 7.1.

Thana Name	Identified Patients	Surveyed Population ('000)	Patients per 10,000 people	Contaminated Tubewells
Bera	86	197	4.3	55%
Jhikargacha	96	267	3.6	59%
Kachua	01	83	0.1	97%
Sonargaon	213	301	7.1	62%
Total	396	848	4.7	61%

In Jhikargacha thana, the largest number of patients, 86 out of a total of 96 patients in the thana, are concentrated in 3 villages of Gadkhali union (63% contaminated tubewells); Bankra, the most affected union with 87% contaminated TWs has 3 patients, all in one family; Shankarpur union with 84% contaminated TWs does not have any patients. Jhikargacha union with 37% contaminated TWs has 4 patients concentrated in 2 villages. Srirampur village with 17% contaminated TWs has 2 patients in 2 families and Gulbaghpur village with 19% contaminated TWs has 1 patient.

Other factors, more than just contaminated tubewells, must therefore be contributing to occurrence of arsenicosis. To this effect, Dhaka Community Hospital is preparing a detailed medical profile of patients to determine what might in fact be the cause.

4. To implement alternative options for water supply, a change in people's attitude and practice is essential. Having completed the testing, all the three agencies are now actively involved in community meetings to discuss where and how the demonstration units for alternative safe water options are to be installed. The options include:

- Sand filters in ponds reserved exclusively for drinking
- Rainwater harvesting units
- Protected ring wells and dug wells for collecting sub-surface water
- Safi filters for arsenic removal
- Indigenous household filters for arsenic removal

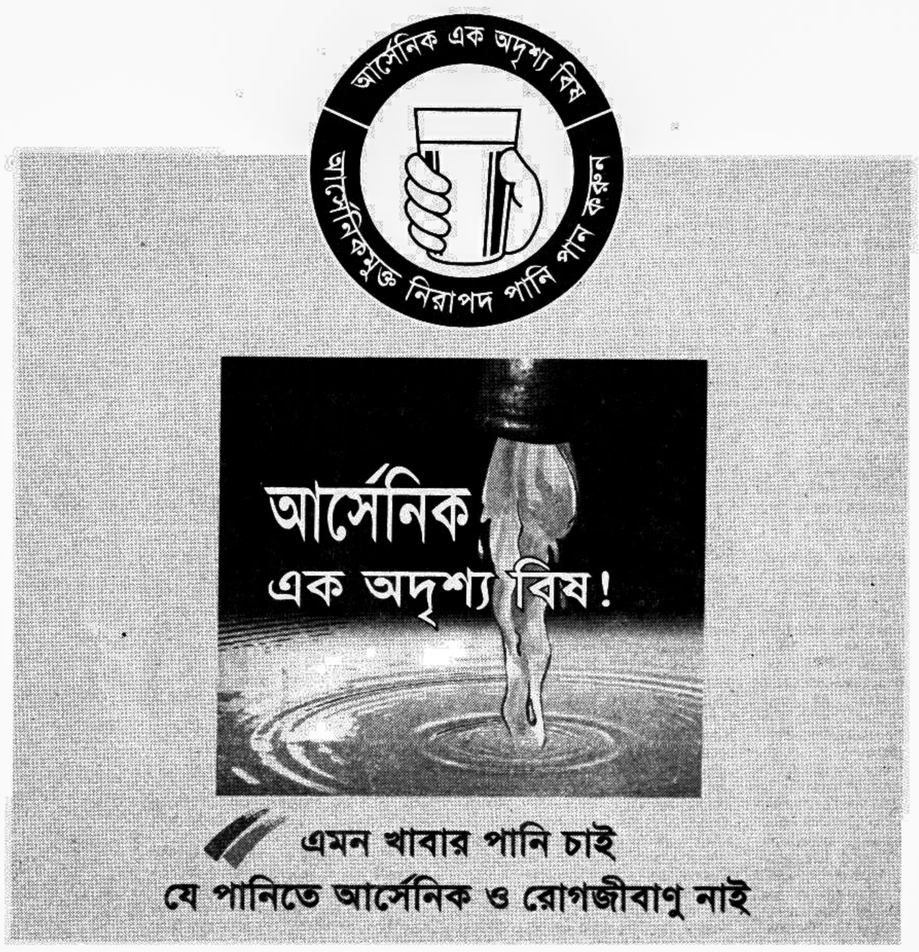
The perception that tubewells are safe is very deep-seated. Even when the tubewells are shown to contain unacceptable levels of arsenic, there are many instances when people continue drinking water from them, partly because they do not want to go and fetch water from a "distant" safe source. At the same time, the urgency to take necessary measures for switching to a safe source is not readily felt. The communication campaign, which is being launched today, is therefore essential to help develop the necessary attitude and practice for appropriate action. This requires mutual reinforcement of initiatives to be taken by all quarters in society, for example: Union Parishad members; DPHE's sub-assistant engineers and tubewell mechanics; village-level government workers such as health and family welfare assistants, block supervisors for agricultural cooperatives and extension; secondary and primary school teachers and students; and imams from local communities.

Each of the alternate options have their own limitations as well. There is an overall reluctance, for example, to reserve ponds exclusively for drinking. Doing fish culture or using them for bathing and washing are not going to be given up readily. In the case of rainwater harvesting, people are not easily convinced that they can adopt a behaviour to store water safely and use it exclusively for drinking, in order to last through the dry season, when no rainfall occurs. The possibility of bacterial contamination, due to unsanitary excreta disposal in the community and of chemical pollution, due to leaching of fertilizer and pesticide residues from agricultural activities, requires that the assurance of safe water quality from ringwells and dug wells is pursued diligently. The proposed arsenic removal filters are all new and still experimental. In spite of encouraging results, more time is needed to see whether it will pass the acid test of people's acceptance, sustained removal efficiency and ready availability in the market in adequate numbers.

The ongoing 4 thana programme is providing a forum for detailed discussion, to help people in the community take decisions on technology choice and also to monitor their technical performance, including the regular testing of water quality parameters to ensure its safety for drinking.

Implications for Accelerated Action

Experience from the 4-thana programme shows that the arsenic mitigation programme can be effectively carried out with cooperation and coordination among all concerned people. UNICEF is committed to expanding its support to 50 thanas, from 788 villages to 10,000 villages in 7 districts in the year 2000. This will be under the overall management of DPHE in close collaboration with NGOs. Plans are underway for organized action, based on valuable lessons learned from the current programme. The scaled up activities under community-based arsenic mitigation will contain all the four elements: blanket testing of all tubewells, identification of arsenicosis patients and their immediate relief measures, communication for behavioural development and change, and community capacity building for decision making and management of safe water options. Close collaboration and coordination will be maintained to complement the Bangladesh Arsenic Mitigation - Water Supply Project supported by the World Bank and Swiss Agency for Development and Cooperation and other programmes supported by other donors such as Danida. Such coordinated action will go a long way in addressing one of the biggest challenges that currently faces Bangladesh.



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