A strategy for fluoride mitigation in rural drinking water systems
A case study of Maharashtra

According to Government estimates, approximately 66 million people in India are at risk of fluorosis (which is more than 5 percent of the total population). Maharashtra is one of 16 states in India where excess fluoride in drinking water and associated fluorosis are known to be endemic. Although the situation is not critical, the Government of Maharashtra (GoM) is developing a strategy for fluoride mitigation for the state in collaboration with Water and Sanitation Program-South Asia (WSP-SA) to provide a long-term solution to the problem.

The process to develop an appropriate framework through which a fluoride mitigation strategy can be operationalized was initiated by the GoM in mid-November 2002 through a request for support. In response, WSP-SA commissioned a preliminary mission in Yavatmal, a major fluoride-affected district in the state, in mid-February 2003. Building on the findings of the report, a concept note for the development of a fluoride mitigation strategy in Maharashtra was formulated.

Based on a situational assessment of three other fluoride-affected districts – Nagpur, Chandrapur and Nanded – in April 2003, a review of common issues was presented in a discussion paper on ‘Water quality in Maharashtra: Situation analysis and recommendations’ along with a set of recommendations.
A consultative workshop of stakeholders held in Nagpur on August 19-20, 2003 debated the discussion paper at length. This initiative received the support of the State Water Supply and Sanitation Minister.

Inputs from participants suggest that a strategy for improvement of drinking water quality and safety management should necessarily be mainstreamed within the setting of the rural drinking water system of the entire state, from the gram panchayat to the district and state level. Indeed, the existing institutions provide the framework for operationalizing such an exercise. The effectiveness of this approach will be ensured by inter-departmental checks and the transfer of funds across departments.

The approach will be driven by two crucial aspects: integration of water and health-related issues; and the effective linkage between surveillance and mitigation measures. Both aspects need to be operationalized at each level – that is, the gram panchayat, district and state level. A Strategy Paper detailing the overall framework is being developed. Requirements for amendments to legislation, a capacity-building plan and training modules, computerized MIS, IEC campaigns, R&D inputs required and a business plan with up-front and recurrent costs will also be included. Once the broad principles are endorsed by the GoM, a Project Implementation Plan (PIP) would be formulated which will focus on aspects critical to setting up a fluoride mitigation system. The PIP would then be operationalized in four pilot districts by June 2004.

Clearly, a strategy for mitigating fluoride cannot be considered in isolation from overall issues of water quality management. While the primary objective of the strategy would be to address the issue of fluoride, this would also require a reorientation in the philosophy of provision of rural water supply services so that the institutions delivering rural drinking water become more responsive and sensitive to issues of water quality and the associated health effects.

For further information, contact: Water and Sanitation Program-South Asia 55 Lodi Estate, New Delhi 110 003 wspsa@worldbank.org

**SANISAT**

**Sources of Drinking Water in India**
Handpumps and wells are a common source of drinking water for most Indians. Out of 36% with access to tap water only 17% have it in their premises.

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taps</td>
<td>38.7%</td>
</tr>
<tr>
<td>Wells</td>
<td>18.2%</td>
</tr>
<tr>
<td>Handpumps</td>
<td>36.7%</td>
</tr>
<tr>
<td>Others</td>
<td>9.6%</td>
</tr>
</tbody>
</table>

Issues of water quality are becoming increasingly significant in the provision of rural drinking water supply services. In this issue of Jalvaani, we review a comprehensive approach to water quality management that is being developed in Maharashtra to mitigate the problem of fluoride in drinking water in the state. The strategy integrates water and health-related issues and creates effective linkages between surveillance and mitigation measures. This will not require any significant change in the way drinking water is delivered but will be based on a mix of education and capacity-building on the software side, and monitoring and technology on the hardware side, and mainstreamed through existing institutions.

Participatory approaches are essential to ensure the sustainability of community-based programs. For this it is necessary to involve the community at the various stages of the project cycle. In Kasargod, Kerala, communities have developed simple tools to monitor and evaluate progress of implementation of schemes that are accessible to all members of the community.

Borban, Maharashtra provides an example of how community solidarity and the desire to improve the sanitation status of the village have resulted in total sanitation, and the village has been declared open defecation-free. The experience of Borban could inspire other communities to achieve the objective of total sanitation.

Looking beyond the region, we examine the model of private sector financing of rural water systems in Vietnam and Cambodia where the rural water supply market is successfully served by small enterprises that either sell water or install water source technologies. Funds are leveraged from a fee-paying consumer base, which frees public finances for investment in other sectors. As the private sector does not have the skill or finances to provide social marketing or health promotion to the consumers, this input may be provided by the public sector, which in turn will create an increased demand for clean water and improved sanitation facilities.

Grassroots, a Kumaon-based NGO, has demonstrated the feasibility of an appropriate technology option to meet the drinking water supply needs in hilly areas by promoting the construction of infiltration wells. These wells are easy to construct and maintain. Over the last few years, this technology option has been installed in nearly 200 hamlets/villages in seven districts of Uttarakhand and Himachal Pradesh.

Shri Kanshiram Rana, Honorable Union Minister for Rural Development, Government of India, shares his views on critical issues in the sector, including the Government’s strategy for scaling up the reform process, capacity-building at the local level, and the focus areas for improving sanitation.

As always, we welcome suggestions on future issues of Jalvaani.
COMMUNITY INITIATIVE

Involving the community in project monitoring and evaluation

Piloting an innovative approach in Kerala

In Kasargod, north Kerala, beneficiaries of sector reform are actively involved in the monitoring and evaluation of water supply schemes using tools designed by the beneficiaries themselves. The community has been empowered to assess the progress of schemes using participatory tools that are simple, logical and easy to use.

To pilot the approach, workshops were organized at the district and the beneficiary group level. A four-day workshop was conducted by PLA Network, a Kerala-based NGO, for members of pilot gram panchayats, beneficiary groups and other stakeholders to develop innovative assessment indicators by collectively revisiting the objectives of the sector reform project and analyzing ongoing activities.

Four aspects of the project are now being monitored in Kasargod: completion of activities; beneficiary contribution to the capital cost of schemes; progress of construction; and O&M of the schemes. Some of the tools being used are:

1. Time-line of the history and activities of beneficiary groups: Every month beneficiaries record the progress of project activities using a time-line, from group formation to commissioning of the scheme.

2. Bar chart for the contribution of beneficiaries: Beneficiaries mark their contribution to the capital cost of the scheme on a bar chart. Installment payments are recorded in different colors. The chart clearly identifies the households with outstanding payments and the amounts to be realized.

3. Mapping the progress of construction: The area and activities covered by the scheme are mapped. Progress (construction of pump house and overhead tank, laying the main and distribution line, household connection, etc) is recorded on the map in different colors.

4. Monitoring chart on O&M: Three indicators have been identified to monitor the participation/level of satisfaction of individual beneficiaries in the O&M of schemes: adequate supply of good quality water, timely payment of O&M charges, and participation of beneficiaries in monthly meetings. Household responses to each indicator are marked every month on the monitoring chart using symbols.

These charts are placed where people regularly meet, such as the gram panchayat office, so that every community member can assess the progress of the schemes.

These creative tools have helped users in Kasargod to effectively monitor the progress of schemes through a transparent and participative process. This process has created a sense of ownership of the project within the community. Women and the elderly, in particular, find satisfaction in recording their contribution on the charts, which has fostered a sense of achievement even though some of them may be illiterate. These tools are viewed as ‘meters’ of community participation. Given the success of the approach, it has been decided to scale up participatory monitoring and evaluation to all the beneficiary groups in Kasargod.

For details, contact:
Secretary, Water Resources Department
Govt of Kerala, Thiruvananthapuram 695 006
“Welcome to Borban – A ‘Hagandari Mukt’ Village”
Achieving total sanitation through community motivation

Today, as one enters the village of Borban, in the dusty mountainous region of Ahmednagar district in Maharashtra, a board at the entrance to the village proudly welcomes visitors to their ‘Hagandari Mukt Gaon’ – or open defecation-free village.

Till about six months ago, Borban was like any other of the numerous villages dotting the landscape of this drought-prone district. As in most villages, the sanitation and hygiene conditions were far from satisfactory and open defecation in the village surroundings was the norm. However, the picture is now very different as all the villagers are using toilets that have been constructed in each household. As a result, the village is kept neat and clean and a sense of achievement and confidence has been instilled in the community.

This transformation began with the village deciding to participate in the Sant Gadge Baba Sanitation Campaign, an inter-village competition of the Government of Maharashtra, which rewards villages that are judged the cleanest with cash prizes. Members of the village actively took part in the competition and Borban was ranked second at the district level. However, the practice of open defecation (one of the criteria for assessment) had resulted in the village losing valuable points.

A meeting at the block level addressed by the CEO of the Zilla Parishad and attended by the Sarpanch of the village, brought home the need for a total ban on open defecation in the village and it was stressed that even one person defecating in the open could affect the health of the entire community.

The village resolved to meet the challenge of ending open defecation in their village and it was decided that each household would construct a toilet for their use. The district administration assisted the community by exposing them to low-cost technology toilets so that they could construct toilets according to their capacity to pay. However, finances proved to be a stumbling block – as the crop was yet to be harvested, the villagers had limited funds and were unable to buy the material required.

The Sarpanch, who had resources generated from his onion trade, agreed to stand guarantee for persons wanting to access the material on credit from shops in the vicinity. With this assistance toilets were constructed, and within a period of a few months the entire village was made open defecation-free. Shopkeepers were paid after the harvest season. In some cases, if the household was unable to meet the full cost of the toilet, they were subsidized by the better-off households.

What were the reasons for the phenomenal success of the sanitation initiative in Borban? The lack of any prescriptive technologies, apart from the minimum safety standards to be followed, led to different types of toilets being constructed of varying costs. The collective action of the villagers to make Borban an open defecation-free village has been crucial for transformation. In fact the village now imposes a fine on those defecating in the open.

Based on the Borban experience, community solidarity and the desire to improve the sanitation status of the village could become a model for total sanitation for the entire district.

For further information, contact:
Chief Executive Officer
Ahmednagar Zilla Parishad
Ahmednagar, Maharashtra
Tel: 0241-2355219
INTERNATIONAL EXPERIENCE

Private sector financing of rural water supply systems in Cambodia and Vietnam

A major challenge in scaling up rural water supply (RWS) service delivery in developing countries is financial constraint. The experience of Vietnam and Cambodia provides instructive examples from the field where the private sector has provided up to 100 percent of the investment of the cost of infrastructure to effectively fill the financial gap. It is estimated that private and/or user investment in the sector far exceeds public investment, allowing public resources to be directed to areas where the private sector may not have comparative advantages.

The RWS market in Vietnam and Cambodia is served by a growing private sector made up of thousands of micro enterprises that fall into two categories: technology supply enterprises and water supply enterprises. Technology supply enterprises are primarily production/supply chains that make, distribute, sell and install water access equipment, storage and purification technologies that enable purchasers to access water. Water supply enterprises sell water, and range from informal enterprises that collect and transport water and sell it door-to-door to piped water schemes that recover costs based on installed water readings. The nature and size of the private sector intervention and the services it provides are tailored to local conditions, including water resource availability, population density, consumer income, user need and preference, and extent of regulation. This strategy has helped to cater to the diverse and growing volume of water needs and user preferences. With its customer-oriented structure and ability to provide cheaper, more localized services than government suppliers, the private sector can provide a viable alternative to public investment.

Case studies of private sector financing in Cambodia and Vietnam reveal that the most critical ingredient for successful private sector participation in the RWS sector is government support. Regulation is also recommended but an effective balance should be maintained between protecting the user/investment and over-regulation, which may inhibit profitability. Pricing controls need to be decentralized to attract investors to the sector, particularly in the more challenging markets where there are higher costs of doing business. However, it is important to keep in mind that the private sector is not socially-driven but profit-oriented. Small enterprises do not have the finances or the skill to provide social marketing or health promotion to their consumers. Such software will have to be provided/funded by the public sector, which will help promote improved health and hygiene behavior and in turn result in an increased demand for clean water and improved sanitation facilities. The government can fuel demand, and in parallel, support the private sector providers with technical backstopping to meet the demand as it emerges.

A detailed report is available at: Water and Sanitation Program-East Asia and the Pacific wspeap@worldbank.org

Solutions for rural water supply are based on local conditions.
Infiltration wells in the hills
An appropriate technology option for community-managed drinking water systems

Most rural areas in the central and western Himalayas suffer an acute shortage of drinking water. The traditional systems of harvesting drinking water from shallow sub-surface capillaries into naulas/bauris are unable to meet the needs of the ever-growing population. Moreover, the environmental degradation of critical catchment areas has affected the sustainability of primary water sources of communities.

To tackle this problem, the government has been investing large funds for the creation of public corporations, which are responsible for planning, implementing, operating and maintaining piped water supply systems in remote villages. These water supply schemes are mainly based on secondary or tertiary water sources, which are not within the jurisdiction of the concerned villages. As a result, appraisals reveal that for a variety of reasons, the water crisis in the area is far from resolved. Grassroots, a Kumaon-based NGO, has been demonstrating the feasibility of an appropriate technology option in the drinking water sector through the construction of infiltration wells.

Infiltration well technology is merely an extension of the traditional system; instead of naulas/bauris which are only 3-6 feet deep, infiltration wells are located about 25 feet below ground level. This allows additional quantities of water to be harvested. Curved concrete well blocks made with a simple well block mould are laid at the base of the well to form a circle. The annular ring is backfired with clean sand and the cap sections laid. Cast column blocks are used to form a column around the casting pipe, which is inserted through a hole in the cap section. Sand backfilling continues till the cap is covered to a depth of 30 cm, after which the excavated material is used.

A block column is built to reach the desired elevation at which the feet of the handpump will be set. A platform is constructed, usually with the pump at the center. The pump discharge faces downhill so that it does not seep back into the infiltration well. The wells are capped and fitted with a handpump, which prevents pollution. The construction of waterseal toilets is encouraged to break the cycle of the spread of waterborne disease. Since infiltration wells are based on primary water resources, user groups are motivated to protect and conserve the environment of the immediate catchment area, providing sustainability to the source.

A major advantage of these infiltration wells is that the drudgery of women collecting water from distant sources is considerably reduced. User groups have the option to recover a small fee each month from each household to pay for the operation and maintenance of these decentralized water supply systems. Over the last few years, this appropriate technology option has spread to nearly 200 hamlets/villages in seven districts in Uttaranchal and Himachal Pradesh.

In order to enable the spread of this technology, Grassroots is organizing artisans guilds in both these states.

For further details, contact:
Anita Paul, Community Coordinator
Pan Himalayan Grassroots Development Foundation
Post Bag # 3, Ranikhet 263 645
Almora District, Uttaranchal
Telefax: 05966-221516, 222298, 221654
email: apaul@grassrootsindia.com
Reforms in the rural drinking water supply and sanitation sector have moved from a sector-based approach to Swajaldhara and now the introduction of the innovative Memorandums of Understanding (MoUs). What motivated the reform program originally and how would you describe the changes in its agenda?

The Government of India (GOI) introduced the reform initiative in the rural drinking water supply sector through the sector reform pilot projects in 1999. The key principles of the reforms are that they should be demand responsive and community-led, with 10 percent capital cost sharing and 100 percent contribution for operation and maintenance (O&M) of the scheme. Communities should be allowed the freedom to fix and levy user charges.

The objective was to lay the foundation for a sustainable rural water supply system where the level of satisfaction of the users would increase and the investment made in the sector since Independence would become sustainable through the introduction of sound O&M practices.

Based on the experience of 67 pilot projects in 26 states, it was decided to extend the benefits of the reforms to cover the entire country. Accordingly, the reform initiative has been scaled up to cover the entire country with the launch of Swajaldhara in December 2002. The comprehensive guidelines on Swajaldhara, issued in June 2003, seek to provide further impetus to the reform initiative by means of a MoU to be signed by the state governments and the GOI.

Reform requires building capacity on the ground. What are the steps that have been taken in this regard to sustain these initiatives?

Local level panchayati raj institutions (PRIs) have a major role to play in the implementation of Swajaldhara. This requires a major initiative by both the state governments and the GOI for building their capacity and to equip them to meet the challenges in the rural drinking water supply and sanitation sector. The GOI is proposing to assist the states in this regard by setting up a Communication and Capacity Development Unit (CCDU) at the state level. A similar set-up is proposed at the district level.

What in your view are the major focus areas for increasing sanitation coverage in the country?

It is a matter of great concern that the coverage of sanitation in the country is only up to 28 percent. Our priority is to increase coverage by creating awareness of the need for sanitation and promoting good hygiene behavior. For this purpose, my Ministry is currently implementing the Total Sanitation Campaign (TSC) in 350 districts in the country, which will be extended to the entire country within a period of two years.

In addition, we would like to increase the involvement of PRIs by giving incentives to PRIs that are able to eliminate the practice of open defecation and effectively promote sanitation. For this purpose, we have instituted the Nirmal Gram Puraskar. We would also like to use the energy and enthusiasm of the over 1.5 million self-help groups in the country to promote sanitation coverage.