

## Bhopal Gas Tragedy

### 'New' Victims

*A new generation is now suffering the aftermath of the Bhopal gas tragedy. Fourteen 'bastis' have been identified as being affected by groundwater pollution. However, no correlation appears to be established between the health conditions of the residents and water contamination, as various surveys and estimates are not conclusive and agencies are bickering over evidence. A health survey by a national agency of repute must be conducted to establish the basis for further action while the acute shortage of water itself is tackled.*

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It's been 22 years since the Bhopal gas tragedy. Today a new generation is suffering its aftermath. Environmental contamination threatens the life and health of people residing in the slums surrounding the Union Carbide India (UCIL) factory. In the interim, several surveys and studies<sup>1</sup> have been conducted to determine the extent of air, water and soil contamination as a result of the gas tragedy. Significant among them have been the reports of the Madhya Pradesh government and the National Environment Engineering Research Institute (NEERI), where the broad conclusions were that water contamination was restricted within the plant site of UCIL, and no traces of chemicals were found in the water sources that may be linked to the chemicals used in the Union Carbide Corporation (UCC) factory. On the other hand, a study by the Boston Citizen Environmental Laboratory and reports by Greenpeace have warned against the dangerous levels of dichlorobenzene – a highly toxic chemical – found in community drinking water, which has an adverse effect on the liver, kidney and respiratory systems.

While conclusions concerning the extent and nature of chemicals have varied, these surveys and reports established that the groundwater and soil were contaminated with hazardous chemicals that were above acceptable limits. In 2004 it was irrefutably established by the Supreme

Court Monitoring Committee on Hazardous Waste Management that due to the indiscriminate dumping of hazardous wastes and negligent practices, together with lack of enforcement by authorities, groundwater and therefore, drinking water was indeed contaminated.

Fourteen bastis have been identified as being affected by groundwater pollution. These slums (Atal-Ayub Nagar, New Arif Nagar, Annu Nagar, Nawab Colony, Blue Moon Colony, Sunder Nagar, Timber Market, Gareeb Nagar, Shri Ram Nagar, Chandwari, Prem Nagar, Preet Nagar, Shri Shakti Nagar and Shiv Nagar) are in close proximity to the solar evaporation ponds. The solar evaporation ponds are large pits, 800m north of the UCIL plant, where waste matter was stored. The chemicals have permeated to below ground level, contaminating the groundwater, which is used as drinking water through handpumps. As the presence of toxins in groundwater was confirmed, the handpumps in these 'bastis' were painted red by the 'Nagar Nigam' indicating that the water was poisonous and undrinkable. This cut off the only source of drinking water for these slums.

In the case of the Research Foundation for Science vs Union of India and Another, the Supreme Court directed the state government of MP to supply fresh drinking water in tanks or pipes expeditiously to the 14 bastis. This article, based on a field study, makes an assessment about how far the Supreme Court order has been enforced and whether

the arrangements made by the state government to provide an alternate source of water are adequate. Do the residents receive an adequate quantity of water? What are the current problems being faced by the people of these bastis? The article also analyses whether the contaminants in the water have led to new health hazards for the residents.

### Before the Supreme Court Order

These bastis are unauthorised constructions, overcrowded and with no sewage arrangements. People live in extremely unhygienic conditions. The standard of living is poor. The main occupation is manual labour or odd jobs in the city. Most children are not sent to school. They are the worst victims of polluted drinking water.

After the handpumps were painted red and the water declared undrinkable, the state authorities made little effort to provide an alternate source of water. A few new handpumps were constructed to replace the old handpumps. Residents say that the Nagar Nigam painted most of the handpumps red but new ones also continue to yield 'zahreela pani' (poisonous water) as they are in close proximity to the original. Most people have dug private wells and drink the hazardous outflow because they cannot walk long distances to look for clean water each time they feel thirsty.

The residents explain that up to a depth of around 70 m the water is relatively clean but below 100 m the water emits a petrol like smell and is contaminated. Most wells are 200 m deep, so as to meet the water demands of so many households. According to officials in the municipal corporation, the government is not responsible for contamination in private tubewells. It is the responsibility of the people to get the water tested and practise caution. If there is no alternate source, then the water can be collected, disinfected and used. This is a far cry from reality since till date residents, due to illiteracy, are unable to comprehend the hazards and take remedial measures.

Even to a layman's eye it is clear that the water is undrinkable from the murky colour and the strong stench it gives off. Most of the residents are unwell and have symptoms like tiredness, breathing problems,

burning sensations, skin abrasions and dysentery. Children are most affected by the latter. Visits to the doctors are frequent. They are given medicines but never a diagnosis. The residents are not sure whether the health problems they suffer are directly linked to the unclean water.

### **After the Supreme Court Order**

Subsequent to the Supreme Court order in 2004, the response of the government has been tardy. Repeated letters by activists and NGOs requesting governmental response appear to be falling on deaf ears. Two months after the Supreme Court directive only 10 per cent of the required water was being supplied. Arrangements were made to send tankers to fill big overhead tanks that have been constructed in the different bastis.

A survey conducted by Sambhavna Trust shows a major shortfall in April 2005. In 14 bastis the water needed per day is 9,86,500 litres. The water being supplied is 1,31,484 litres. Another survey in September 2005 revealed a water requirement of 8,81,500

litres while the supply was a mere 1,06,000 litres. On May 17, 2005 over 200 residents from the affected communities stormed the office of the director, Department of Bhopal Gas Tragedy Relief and Rehabilitation demanding full implementation of the May 7, 2004 order of the Supreme Court.

The tankers are unreliable, sometimes only half the number of tanks designated to service an area arrive, while in other cases the tankers do not make the assigned number of rounds in a day. The tanker in Sunder Nagar did not arrive on the day this author spent there. It is alleged that in some instances the water for these residents, is sold by private suppliers to hoteliers. This sham is possible as there is no system in place to record the arrival and departure of tankers, and the quantity of water supplied to each basti. Although some residents from each basti have been appointed to keep track of their supplies the system is far from satisfactory and in case of grievances, there is no redressals mechanism.

Shortage of tanker water has become a bone of contention resulting in inter and intra-bastis violence that is destroying

the social fabric of these settlements. A resident of Annu Nagar complains that in her colony the 'tankis' (overhead tanks) are at a distance. The seven to nine houses close to the tankis use up the water before she has access to it. Some people even lock the tankis so that others cannot use the water. Each household is allowed to fill a maximum of four to six utensils. This maybe sufficient for a small family, but not for a large family. Hence they resort to handpump water. In the rainy season, the visits of the tankers dry up as it becomes quite impossible to manoeuvre tankers through the 'kaccha' lanes.

There are complaints about the quality of tanker water as well. Residents say the tanker water is 'maila' (dirty). One old resident in Atal-Ayub Nagar said that she would use the handpump water. She claimed that her stomach would swell up, her eyes would become watery and she would have a persistent body ache so she switched to tanker water. However, she found the tanker water unclean as well and now she arranges water from the masjid well, which is at a considerable distance.

To overcome the shortage, and having become reconciled to the sub-standard quality of tanker water, some residents have even requested opening up the red handpumps. Applications in this regard have been submitted to the municipality. This undermines the efforts made by the NGOs and activists to secure better facilities for the bastis and has an adverse effect on the ongoing legal proceedings for environmental contamination against UCC and Dow Chemicals (the company which has taken over UCC), at home and abroad. These applications weaken the case by creating an impression that the situation is not as serious as it is made out to be by the NGOs, since people are willing to drink the water.

The official side of the story attributes the problems of the affected bastis to the overall shortage of water in Bhopal city and the lack of finances for major improvements. The norms require that each person must be provided with 135 litres per capita per day (lpcd) but only 60 lpcd is provided to the settlers. For the contaminated bastis three main schemes are underway. First, the improvement of the water distribution network under the Jawaharlal Nehru National Urban Renewal Mission, which will focus on supplying water through pipelines. Switching to pipelines appears logical and rational, as currently Rs 3 crore is spent annually on the supply of water through tankers. Pipelines will ensure good quality water and within easy reach of the residents. Second, augmenting water supply by 400 lakh gallons per day to Bhopal through the Narmada Water Supply project. Third, under Supreme Court order Rs 17 crore has been set aside to provide clean drinking water to the affected bastis. The officials in the municipal corporation estimate that it would take about five years to provide clean water to every resident in the affected areas.

### Water Quality and Health

According to a recent survey conducted by the community health workers of Sambhavna clinic in Annu Nagar (population 1,528), 91 per cent of the residents were using water from contaminated handpumps. According to the survey, every second person in the community was suffering from a multitude of symptoms. The most common symptoms among all age groups were found to be abdominal pain followed by giddiness, pain in the chest, headache and fever. These symptoms

were most frequent among gas affected people who were additionally exposed to contaminated water. One of the significant findings was that among teenage females between the ages of 13 and 15, 43 per cent had begun their periods. In another survey by Sambhavna clinic, the prevalence of anaemia among men in Atal-Ayub Nagar was 97.5 per cent. The study stated that anaemia does not appear to be a major problem in India, since no data could be found to estimate general prevalence.

In a report on the extent of chemical contamination around residential areas surrounding UCIL conducted by an environmental consultant, it was found that seven to eight samples of breast milk out of 11 had the presence of lead. While one NGO supports the finding that chemicals are present in breast milk and has also affected the menstrual cycles of girls, another organisation in the same area asserts that health problems can be linked to the chemicals but not to such an extent. The latter points out that the number of people examined in the survey was not sufficient to concretely establish presence of toxins in breast milk decisively.

The chairman of the Madhya Pradesh Pollution Control Board (MPPCB) emphasised that even if there were chemical elements present in the water, the situation was under control. He maintained that no clear-cut nexus could be drawn between the health ailments of the surrounding bastis and the chemical toxins in the water. The ailments suffered by the residents of the bastis, were of a common nature, arising from faecal and bacterial pollutants and could be found in residents of other bastis living in similar unhygienic conditions. This position was reiterated by the principal secretary of the Gas Relief Department who said that the health problems in these areas was due to the unplanned and unstructured development of these slums around the factory site and had little to do with their proximity to the solar evaporation ponds. The alarm created about deteriorating health conditions was racketeering on part of the NGOs and could not be corroborated with any substantial evidence.

A private doctor practising near the bastis who tended to the majority of residents said that there were no health threats due to the contaminated water. He felt that talk about the contaminated water leading to diseases was a lot of hype created by the NGOs and residents of the area. The doctor reiterated that health problems faced by the residents were no different from those

of any other slum residents arising from illiteracy and unhealthy living conditions. Another private practitioner in the area pointed out that the main problems with respect to the gas tragedy were only respiratory problems like bronchitis, asthma, etc. There were only 2 to 3 per cent of residents who were truly unwell due to gas leak and its aftermath, while most other complaints were due to an unhealthy lifestyle.

The chief medical officer of Bhopal explained that there were no reported cases or complaints where the disease could be attributed to toxic groundwater. According to the director of the Centre for Rehabilitation Studies, the nexus between contaminated water and health problems has not been confirmed through any scientific survey. The department has carried out a pilot survey to observe the disease pattern (distribution of disease), which demonstrates that 47 per cent of people suffer from respiratory problems, and the second highest number of diseases are related to gastro intestinal system. These results are similar to any other disease pattern in a gas affected area and have little to do with contaminated water. It is also important to establish the extent to which each individual has been exposed to the chemicals, like in the case of the MIC leak, the degree of exposure to the gas was critical in establishing the class of ailment. Hence a one part study or a cross section study is haphazard and does not constitute scientific findings. A positive association of contaminated water and disease pattern can only be proved after a scientific study. However, the findings admitted that people in these bastis were more susceptible to diseases and therefore such a comprehensive study must be launched immediately and completed within the next two years.

No correlation appears to be established between the health condition of the residents and water contamination. While various surveys and estimates exist, they are not conclusive enough. Rival NGOs disprove each other's findings. The reason for this nebulous state of affairs is that no scientific, credible and accurate health survey has been undertaken, which would reflect the true status. In the absence of such a survey it is not possible to take effective, preventive and curative action. That the various agencies, are bickering over "evidence", "establishing nexus", and "drawing links" is shameful. It took 10 years to decisively prove soil and groundwater contamination, this should

not take another 10. A health survey, by an agency of national repute, such as the National Institute of Occupational Health, must be conducted without any further delay to establish the basis for further substantive action.

Mercifully, there is no ambiguity about the fact that there is a serious water shortage in these 16 bastis. All quarters accept that there is a crisis at hand. Whether the adverse health conditions are correlated with the toxins present in the water is immaterial; the grim reality is that residents are consuming toxic water on a daily basis. Access to groundwater needs to be stopped entirely. The authorities are currently afraid to do this and concede it will lead to acute water shortage since they are barely able to provide enough fresh water to people for drinking purposes.

To augment the water supply and ensure its equitable distribution, short-term measures would comprise of putting in place an efficient water distribution network. The movement of water tankers and supply to overhead tanks should be monitored and committees of residents within the bastis should be appointed to oversee the fair distribution of available water. Moreover, the mobility of water tankers during the rainy season should be improved through the construction of suitable pathways and tracks.

The long-term solution is to expedite the various pipeline schemes which are expected to bring water from the Bada Talab (big lake) and Kolar dam. For Sundernagar and Navjeevan colony there is a proposed Rs 2 crore plan to bring in water from Kolar dam till June 2006. The initial groundwork for laying a pipeline began in Navjeevan colony, however, work has been stagnant for the past six months. A Rs 1.5 crore scheme is in the offing to bring water from Rasla Khedi through pipelines to Atal-Ayub Nagar. Until these pipelines are constructed, which take time and money, the pressure on providing tankers should be kept up.

The objective here is not only to supply adequate quantity of water expeditiously but also to provide water of good quality. The inhabitants of these slums have the right to receive the same quality of water as any other resident in Bhopal. Hence, apposite planning of large projects is mandatory to avoid wastage of resources. The authorities must aim that handpumps and any other sources yielding zahereela pani must be destroyed within the year. **EW**

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## Note

- 1 NEERI issued a report in 1990 with the overall conclusion that no contamination of soil and groundwater was found due to the impoundment of waste water in solar evaporation ponds. The second NEERI report found contamination within the former UCIL plant site, however it reaffirmed that there was no groundwater contamination in and around the plant site. In July 1998 the state government through the Madhya Pradesh State Pollution Control Board (MPSCB) reported that the study found no traces of chemicals in the water sources that may be linked to the chemicals used in the UCC factory.

In 1990, a study by the Boston Citizen Environmental Laboratory reported that the water had been contaminated to dangerous levels. According to this report, one of the most toxic chemicals, dichloro-benzene was found in the community's drinking water, which damages the liver, kidney and respiratory systems. In May 1999, a Greenpeace report found severe contamination of land and drinking water; the contamination level was 10 times higher than the surrounding areas. In 2002, another Greenpeace report stated that solvents used in Union Carbide processes had leaked into the groundwater over the years and now contaminate the wells that serve thousands of people living nearby.