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**Point for discussion this month** **Water bodies downstream to Metros.**

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## Eternal Words

*Waste not the smallest thing created, for grains of sand make mountains, and atomies infinity.*

*~E. Knight*

*The gross heathenism of civilization has generally destroyed nature, and poetry, and all that is spiritual.*

*~John Muir, letter to J.B. McChesney, 19 September 1871*

*In an underdeveloped country, don't drink the water; in a developed country, don't breathe the air.*

*~Changing Times magazine*

Dear Readers,

The eye catching view of Ujjani Lake! Constructed in 1980 this terminal lake is having intensively developed catchment.

In this issue you can read a detailed report of massive environmental campaign organized by Maharashtra Vikas Kendra in presence of Dr. Rajendra Singh, Magasey Award winner.

Many times fresh water bodies are deteriorated by human interference. Ujjani lake is considered as a benefit for the drought prone catchment. But in last few years the lake is facing eutrophication problem and the water quality has been significantly deteriorated.

To eradicate or prevent pollution of water bodies which are used as drinking water sources special task groups should be created by the local authorities. Regular monitoring and analysis of river water quality at every kilometre by involving local people is necessary. This will help to increase awareness about that drinking water source among local people.

In case of Ujjani reservoir the upstream metros must recognize the natural and constitutional rights of down stream people of clean and pure water for drinking. We can observe the upstream-down stream conflict in case of many polluted water bodies all over the world.

Governance Environmental Accountability and Responsibility (GEAR) also plays very important role in eradication of pollution. Sandeep Joshi has presented a paper on this aspect in 14<sup>th</sup> World Lake Conference (WLC) at Austin, Texas. We will discuss that in detailed in our next issue.

Thank you,  
Chief Editor

### **Massive Environmental Campaign form Pandharpur to Ujjani lake to Create Ujjani Lake Pollution free and Awareness among citizens on the bank of Bhima River.**

This campaign was organised and designed by *Jal Pradushan Virodhi Kriti Samiti*, Solapur under the guidance of Maharashtra Vikas Kendra, Pune and supported by National Jal Biradari to create awareness about the health and environmental impacts of pollution amongst the thousands of victims of Ujjani Lake during 21<sup>st</sup> - 23<sup>rd</sup> Aug. 2011 in Solapur District.

In this programme, Dr. Rajendra Singhji, President of National Jal Biradari (Magsaysay Award Winner) had eloquent talks with various educated and ignorant sections of the rural society including school children, women, teachers, lawyers, doctors, senior citizens, industrialists and volunteers.

The major objective of this campaign was to understand the dilapidated conditions of villagers due to severe Ujjani pollution. This pollution is an impact of insensitive upstream urban development and industries which are discharging untreated or partially treated wastewaters into the tributaries of Bhima River violating all environmental laws and natural justice.

This campaign started from Pandharpur on 21<sup>st</sup> Aug. 2011 in auspicious presence of Hon. Swami Ramanujacharya and Maharashtra state's Minister for Water and Sanitation Hon. Shri. Laxmanrao Dhoble. Dr. Rajendra Singhji requested the invitees to vow to give life for the cause of Bhima rejuvenation. A team of 20 water experts of Jal Biradari from Bihar, Orissa, Gujrat, Karnataka and Maharashtra visited Pandharpur, Sangam, Babhulgaon, Wafegaon, Wagholi, Lavang, Shripur, Malinagar, Patwardhan Kuroli, Akluj, Karkamb, Modnimb, Madha, Tembhurni and Ranzani (Devachi) in Solapur District downstream of Ujjani Lake during this campaign.



Dr. Rajendra Singhji, President of National Jal Biradari (Magsaysay Award Winner) addressing the gathering

### Background

In a decade, water quality of 7 rivers of Pune – namely Mula, Mutha, Pawana, Indrayani, Ram, Ambil and Nagzari deteriorated over the period of time with respect to two critical parameters – Dissolved Oxygen (very important of life in water body) and Fecal Coliforms (very important for indication of human pathogens).

Dissolved oxygen in the above mentioned rivers reduced to zero from last 7 years in non-monsoon period and fecal coliforms have increased ten thousand times from zero to more than millions in the river waters up to Ujjani Reservoir. Risk of water borne diseases has increased several times in the downstream of Pune city (among the million population using Ujjani’s water for drinking purposes).

Organic pollution is mostly attributed to upstream urban growth where untreated sewage is thrown into the rivers before the Ujjani Lake. Industrial pollution more of toxic in nature has damaged the ecosystem severely downstream of Pune city. Wastewater discharge (untreated or partially treated)

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into the rivers carrying water to Ujjani Lake has almost doubled in last 10 years. In 2000, wastewaters discharged from Pune-Pimpri-Chinchwad and industries were about 700 MLD but in 2011, it is about 1500 MLD. There is severe problem of leachate from unscientifically developed and managed solid waste dumping sites viz. Urali Devachi, Moshi etc.

Many villagers noticed that the hazardous gases (including methane, hydrogen sulphide etc) erupting from Ujjani Lake many times in the year indicating the deteriorated ecological health of the water body. It is estimated in one study that about 5000 tons of methane gas is generated annually due to accumulation of pollution in the Ujjani Lake. Villagers (of about 200 villages) along the polluted stretches of rivers in Ujjani Basin downstream of Pune city are compelled to drink tubewell water which has high concentration of hardness (a cause of kidney stone). Concentration in the tubewells / wells along ranged from 400 – 800 mg/L while the drinking water standard for hardness is 300 mg/L. It is also noticed that brittleness of bones, dental problems among the children and aged groups were prevalent

### Observations during the campaign

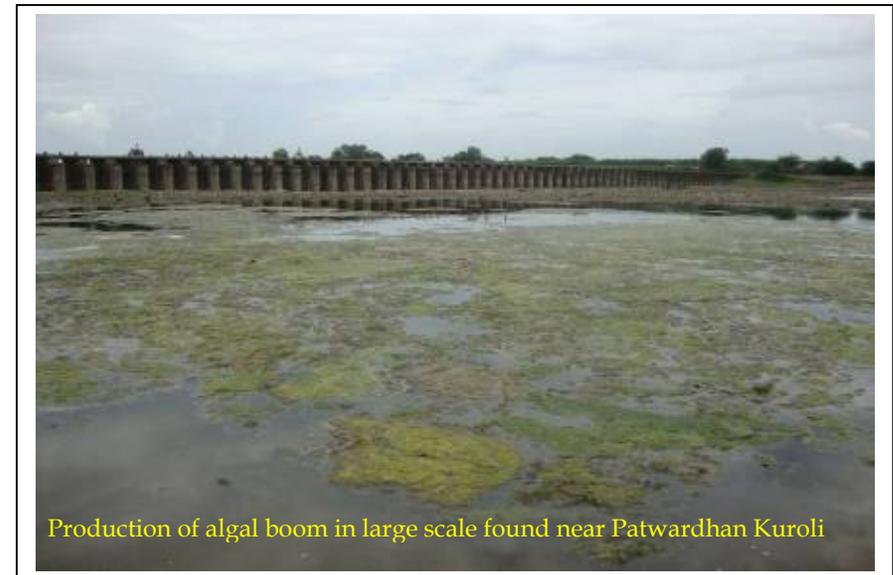
1. Bhima River downstream of Ujjani Lake does not have ecological flow to maintain its biodiversity and to provide sufficient water to the villages along the bank. Whatever water flows in the river, the pollution levels are very high with foul odours.
2. Bhima River at Pandharpur is laden with sewage from the city and open defecation. On 21<sup>st</sup> Aug. 2011, at 4.00 pm the river water was tested for Dissolved Oxygen (DO), Total Hardness and Nitrates using simple test kits. DO was 2 – 3 mg/L, hardness 300 mg/L and nitrates 10 mg/L. This implies that the water is not potable. Both the banks of the river were very dirty, people have thrown enormous wastes.
3. River and well-water samples were tested in Pandharpur, Sangam, Babhulgaon, Wafegaon, Malinagar, Patwardhan Kuroli, Akluj, Modnimb, and Madha. Except Madha, at every location hardness of the river water was in the range of 300 – 400 mg/L and hardness of well water and tube well water ranged between 350 – 750 mg/L. Concentration of nitrates of the river was 10 – 50 mg/L. near Patwardhan Kuroli the concentration of nitrates was highest.
4. River was highly eutrophicated with algal blooms near Patwardhan Kuroli. People of this village complained about the miscarriages of cows, buffellows

due to dirty, unclean, non drinkable and polluted water. Children were found to be anaemic. About 200 patients due to water-borne diseases visit 5 doctors' dispensary every day in a village of 4500 population. Really, the health of villagers is in bad shape in Patwardhan Kuroli when our team discussed with the group of villagers and senior citizens gather here to understand cause of Bhima river pollution in the meeting.

5. At many places, villagers complained about direct discharge of spent wash in the river. At many places including Nira-Narsinhapur, the river was found to be polluted with foul odours. People have deep fear about the pollution in the river.
6. Fear of the river pollution is compelling the people to drink the hard well or bore well water which the cause of kidney stones. Higher nitrates in the water are leading to anaemic conditions. Algal Growth is responsible for toxic releases in the river water. Many of the villages don't have adequate water treatment facilities.
7. It can be concluded that the urban pollution from upstream metros, excessive use of fertilizers and discharges of sugar-distillery wastewaters are affecting the health and agro-economy severely. Lot peoples complained about that, there is no control by State Govt's senior officials on civic bodies, i.e. .PMC, PCMC, other Nagarpalika & MIDC etc those which are responsible for water pollution.
8. Incessant sand mining despite of legal bans is a major cause of accidental death of women and children who are mistakenly approach deeper stretches of river for washing or bathing.

Everyone should understand and confirm that "River "is common property and its belongs to all peoples; State Govt has to act as his "trusty "not owner of river. Its peoples responsibility to keep it clean and continuous watch on pollution of river.

- Pallavi Patil



**Exerts of on of the paper published by Sandeep Joshi in 14<sup>th</sup> World Lake Conference, Texas University, Austin (US) on Impact analysis of agriculture and agro-industries on Ujjani Reservoir, Maharashtra, India**

In Maharashtra, rate of fertilizer use increased from just 14 kg /ha in 1970-71 to currently around 75 kg/ha (average consumption). It is observed that sugarcane consumed very high quantity of fertilizers such as per hectare consumption of fertilizers for this crop moved up from 226 kg per hectare in 1972-73 to 501 kg per hectare in 1990-91. Catchment of Ujjani reservoir is known for its modern agriculture and cash crops.

There are about 18 sugar factories (co-operative plus private) having crushing capacity to the tune of 47,000 tons/day.

**Pollution Load Estimations**

1. With domestic effluents to the tune of 1500 MLD having average solids concentration as 182 mg/L from upstream urbanized growth. Solids contribution other than natural siltation to the Ujjani Reservoir is calculated 274 tons/day. (Joshi, Sandeep et. al 2010).  
Annual solids accumulation budget of Ujjani Reservoir is calculated as –  
Cultural siltation (solids from urban and industrial growth) + natural siltation = 100010 + 59330 (Mundhe, M. S., et.al 2008) = **159340 tons/year**
2. With crushing capacity of 47,000 tons/day, the effluent generated by the sugar factories in the Ujjani catchment is estimated as 11280 cu m/day having COD about 1500 – 2000 mg/L. Load soluble COD/day is calculated as 22.56 tons. These factories run for 6 months approximately. Therefore, total is estimated as 22.56 tons/day x 180 days = **4060.8 tons COD**.
3. Average COD of Ujjani Lake water is 48 mg/L. Total soluble COD in the Ujjani water is calculated as –  
Concentration x storage capacity of reservoir = 48 mg/L x 3491 million cu m = **167568 tons COD**
4. Nitrate loading due to agricultural use of chemical fertilizers -  
Assuming on the basis of references and factual information through interviews that about 330 kg of fertilizers per hectare per annum is used for sugarcane farming –  
198 kg N fertilizer x 170000 ha = 33660 tons/year N is used for sugarcane  
  
As compared to sugarcane, use of chemical fertilizer for other crops is insignificant in the Ujjani catchment.

5. Assuming leaching of nitrate in agricultural runoffs considering its utilization by crop and contribution from effluents of agro-based industries, it is estimated to be less than 5 mg/L. But it is observed in the range of 10 – 19 mg/L in various sampling programmes during 2002 – 2008.

**Impact of Ujjani Pollution**

1. Many villagers noticed that the hazardous gases (including methane, hydrogen sulphide etc) erupting from Ujjani Lake many times in the year indicating the deteriorated ecological health of the water body. It is estimated from the load calculations that about 25000 tons of methane gas is generated annually due to accumulation of pollution and another 25000 tons from the sediments in the Ujjani Lake.
2. Villagers (of about 200 villages) along the polluted stretches of rivers in Ujjani Basin downstream of Pune city are compelled to drink tubewell water which has high concentration of hardness (a cause of kidney stone). Concentration in the tubewells / wells along ranged from 400 – 800 mg/L while drinking water standard for hardness is 300 mg/L. It is also noticed that brittleness of bones, dental problems among the children and senior citizens were prevalent.
3. Bhima river downstream of Ujjani Lake does not have ecological flow to maintain its biodiversity and to provide sufficient water to the villages along the bank. Whatever water flows in the river, pollution levels are very high with foul odours.
4. River was highly eutrophicated with algal blooms near Patwardhan Kuroli. People of this village complained about the miscarriages of cows due to dirty, polluted water. Children were found to be anaemic. About 200 patients due to water-borne diseases visit 5 doctors' dispensary every day in a village of 4500 population. Really, health of villagers is in bad shape in Patwardhan Kuroli.
5. Fear of river pollution is compelling people to drink hard well or tube-well water which is the cause of kidney stones. Higher nitrates in the water are leading to anemic conditions. Growth of algae is responsible for toxic releases in the river water. Many of the villages don't have adequate water treatment facilities, so they are suffering from gastro-intestinal diseases.
6. Impacts of Ujjani Lake / Bhima River Pollution  
Deterioration of public health – unhealthy life – severe impact on babies and children – as per the survey and interviews it is estimated as \$10 million annually (\$ 1 = Rs. 49.50).  
Deterioration of cattle health and loss of fertility - \$ 7 million annually  
Deterioration of agricultural production – loss of economy – 40% of total agro-income of individual farmer  
Deterioration of groundwater – future loss of health and economy  
Ecological loss of biodiversity

**Glimpse of Massive Environmental campaign organized by Maharashtra Vikas Kendra, Pune and Rastriya Jal Biradari during 21<sup>st</sup> to 23<sup>rd</sup> August, 2011 from Pandharpur to Ujjani Lake.**

