



**Food and Nutrition Security
Community**



Environment

Water Community



Solution Exchange for the Food & Nutrition Security Community Solution Exchange for the Water Community Consolidated Reply

***Query: Impact of Industrial Pollution of Groundwater on Agriculture
- Experiences***

**Compiled by Gopi Ghosh and Pankaj Kumar, Resource Persons and T. N. Anuradha and
Ramya Gopalan, Research Associates
23 April 2007**

**From: Saugat Ganguly, Gamana, Hyderabad
Posted 3 April 2007**

Dear Members,

I work for Gamana, a Hyderabad based NGO working on reducing industrial pollution through public participation. To overcome lack of monitoring by respective Pollution Control Boards, Gamana has formed youth groups in five villages, which look out for instances of dumping of industrial effluents into agricultural lands, tanks, canals and streams. They then inform the Pollution Control Board of such dumping, which collects samples and takes appropriate action.

During the above process, we have observed that contamination has reached groundwater now and is affecting agriculture-based livelihoods of rural people drastically. Our experience from the industrial estate in and around Patancheru near Hyderabad shows that when contaminated groundwater is used for irrigation, it reduces crop productivity tremendously and damages agriculture lands permanently. Estimates suggest more than 2,000 acres of agricultural land have been damaged in the above area alone. Additionally, local people report that food grown in the polluted water has a different taste and colour than that grown in non-polluted water.

We are not aware of any studies corroborating the modified levels of chemicals, nutrients and the heavy metal content in food grown out of polluted water. However, numerous studies in the above area show that the incidence of Total Dissolved Salts and heavy metals in groundwater is much above prescribed WHO norms. A recent survey by Greenpeace also found high correlations between greater occurrence of respiratory diseases and cancer and the high levels of water contamination levels in and around Patancheru.

In the above background, I request members to kindly share their experiences on the following:

- Experiences and data from India on the impact of industrial and chemical pollutants on productivity and quality of agricultural products. Members may also send in relevant research on the impact on food quality and human health.
- Suggested economic, legal and policy instruments for controlling contamination of groundwater from industrial pollution and for treating land affected by such contamination.
- Experiences on mobilising local communities to monitor and take civil action against such violations.

Your inputs will help us design a methodology for assessing the impact of industrial pollution on farmers living near industrial areas of Hyderabad and provide action points for resolution of the problem.

Responses received, with thanks, from

1. [Sacchidananda Mukherjee](#), Madras School of Economics, Chennai
2. [Inder Abrol](#), Centre for Advancement of Sustainable Agriculture, New Delhi
3. [Sarbeswara Sahoo](#), Kalpataru, Orissa
4. [Murali Kochukrishnan](#), Action for Food Production (AFPRO), Bhubaneswar
5. [Prabaharan](#), Public Action, New Delhi
6. [D. Nagasaila](#), Advocate, Chennai
7. [Rajagopalan Jagannathan](#), FABCON Engineers (P) Ltd, Chennai
8. [Surendra Kumar Yadav](#), National Institute of Health and Family Welfare, New Delhi
9. [Ajit Seshadri](#), The Vigyan Vijay Foundation, New Delhi
10. [T. N. Anuradha](#), Food and Agriculture Organization of the United Nations (FAO), New Delhi
11. Vijay Kumar, Chartered Environmental and Water Resources Exploration and Development Associates, New Delhi ([Response 1](#); [Response 2](#))
12. [Ramesha Gowda](#), Karnataka State Pollution Control Board, Bangalore
13. [Lata Raman](#), Jawaharlal Nehru University (JNU), New Delhi
14. [Gopi Ghosh](#), Food and Agriculture Organization of the United Nations (FAO), New Delhi
15. H. S. Sharma, Independent Consultant, Gurgaon ([Response 1](#); [Response 2](#))
16. [Pankti Jog](#), JANPATH, Ahmedabad
17. [R. Srikanth](#), WaterAid, New Delhi

Further contributions are welcome!

Summary of Responses

Industrialization, with its economic growth and prosperity can also bring unintended and adverse affects to the natural resources and livelihoods of farmers within the vicinity. Responding to the query on the "impact of industrial pollution of groundwater on agriculture," members shared experiences and examples of the environmental and social impacts of industrial effluents on groundwater affecting agricultural production, the environment and livelihoods of people. They also mentioned technical, legal and social measures to mitigate the impact of pollution.

Members reported the results of various studies conducted on the **impact of industrial effluents** on irrigation. Reports show groundwater pollution due to continuous disposal of industrial effluents on land beyond the point of its assimilation has caused havoc across the country. Respondents cited an experience from [Punjab](#) where the pharmaceuticals are literally wiping out the ground water sources. They also highlighted various experiences from [Gujarat](#) where industrial activities is increasing salinity of land, damaging water resources (including marine life) and in a case where government issued warnings

against eating agricultural products grown locally. In [Uttar Pradesh](#), untreated, toxic effluents from different industries have severely damaged crop production and endangered the lives of local residents. Other negative affects mentioned included:

- Poor water quality- with respect to odour, taste, hardness
- Increased scarcity of quality water in rural areas, due to poor water resource management decisions, forcing villagers to stop cultivation
- Ecosystem dysfunction and loss of biodiversity, causing farmers to move away from traditional cropping patterns, resulting in a decline in sustainable food resources
- Increased risk of acquiring diseases and ailments (e.g. due to bioaccumulation/bio-magnification of heavy metals) like methemoglobinemia from high nitrate concentration in drinking water
- Contamination of marine ecosystems from land-based activities
- Forced migration for work because damage to natural resources

Additionally, members noted that as pollution levels increase, traditional methods of dilution no longer work, thus raising the costs of remediation.

Discussing various impacts of industrial effluents on agriculture, human health and environment, members pointed out **industries are not conforming to the standards** for effluent discharge prescribed by Pollution Control Boards; instead, they are adapting short cut methods of directly discharging effluents into the environment. Moreover, there is often a lack of effective resource management and appropriate mechanisms to run effluent treatment plants.

What is required, respondents argued is more effective professional and technical integration of environmental concerns into policy formulation and implementation; enhancing institutional structures to strengthen monitoring, compliance and enforcement of environmental laws and standards by the state administration, district authorities and community groups to promote sustainable industrial enterprises with local relevance.

Members put forward several specific **suggestions for reducing and/or mitigating** the impact of industrial pollution in agricultural activities. However, they also cautioned that the level of severity is crucial factor in determining the feasibility of adopting the suggested measures.

Technical Measures

- Use low cost adsorbents like orange peels, green coconut shell and bagasse pith to treat wastewater
- Make access to clean, low scale technology for safe disposal of waste by industries readily available
- Conduct a study on bio-monitoring of water quality management
- Generate relevant data for assessing water quality monitoring programmes by deployment new techniques in environmental chemistry and toxicology for more cost-effective determination of water quality problems with defined indicators, parameters, tolerance limits, frequency and sampling points
- Address the technical inefficiencies and operational problems of industrial and municipal wastewater treatment facilities

Legal Measures

- Integrate water resources management in industrial operations as outlined in various components of the National Water Policy constituted in 2002.
- Frame adequate local laws and bylaws through the participation of local communities to address the issue of untreated disposal of effluents
- Make water protection and general environmental health policies consistent across regions
- Utilize existing laws, like the Violation Law of Land And Ground Water Rules For Sustainable Protection of Common Property to ensure protection of rights and enforce policies related to the use of surface water linked with pollution and dilution requirements during periods of low flow
- Enforce strictly the "polluters pay" principle, by claiming compensation from polluting industries and approaching the courts as needed, for example in [Gujarat](#) the High Court penalized one industry Rs.

30 lakhs to compensate farmers for the industry's failure to adequately prevent contamination of groundwater and another case from [Tamil Nadu](#) where farmers received compensation for loss of productivity due to pollution

Social Measures

- Persuade socially responsible entrepreneurs take steps to reduce the impact of pollution
- Mobilize NGOs to sensitize people the issues related to industrial pollution and take collective action to address problems, for example in [Kerala](#), community led initiatives lead in one case to the non-renewal of one company's license and the closing a factory in another
- Encourage industries to pool money for water treatment and involve villagers to build treatment plants, to treat the effluents and agree to share treated water equally for irrigation
- Integrate management of water quality with managing water quantity to reduce conflicts
- Use a decentralized and participatory management system, reconciling development issues with environmental protection, for example in [Tamil Nadu](#) a Local Area Environmental Committee was formed to monitor and industrial pollution
- Disseminate data and information properly to heighten awareness and mobilization of the public sector and society regarding the impact of untreated effluent on the environment and livelihoods

Reaping the benefits of industrialization does not mean compromising on the quality of lives, livelihood and the environment, respondents stressed. They argued that along with industrialization, environmental management capacity has to be enhanced simultaneously to obviate the ill effects of pollution.

Comparative Experiences

Tamil Nadu

Local Area Environmental Committee Monitors Industrial Pollution (from [Sacchidananda Mukherjee](#), *Madras School of Economics, Chennai*)

The direct disposal of industrial effluents on land by industries located in Mettupalayam taluk has resulted in the pollution of shallow open wells and increasing the salt content of the soil, which has affected traditional cropping patterns. A Local Area Environmental Committee (LAEC) has been constituted by the Pollution Control Board to monitor the effluents released by industries and suitably advise them on the required necessary action to correct the problem. [Read More](#)

Farmers Seek Compensation for Damage to Land and River in Tirupur (from [D. Nagasaila](#), *Advocate, Chennai* and [A Prabakaran](#), *Public Action, New Delhi*)

Industrial effluents from textile industries in the Noyyal River basin have grossly polluted both the groundwater and the river causing irreparable damage to agricultural fields. The farmers along the Noyyal River basin filed cases to get compensation from the textile and dyeing industries, basing their case on scientific arguments. The farmers won and received a total compensation of Rs. 24 crores for the damage done to their land. [Read more](#)

Kerala

From [Murali Kochukrishnan](#), *AFPRO, Bhubaneswar*

Community and Panchayat Join Hands To Save Their Land

Plachimada villagers were quite hopeful of their economic and social upliftment with Coca Cola starting operations in their village. Soon to their dismay, villagers faced acute water shortage due over extraction by the industry and later stopped cultivation due to water scarcity and degrading soil quality. The communities under the leadership of panchayat filed case against the company and did not renew their licence to operate. [Read More](#)

Community Movement Shuts Mayoor Rayons

The Mayoor Rayon factory released massive volumes of pollutants into the Chaliyar River in Kozhi-kode district, causing the death of hundreds of villagers, wrecked health on many more, along with several damaging the local bamboo forests and converted the diverse natural forests to monoculture plantations. After the release, the community working with the discretionary powers of the Panchayat forced the Pollution Control Boards to permanently close down the factory. [Read More](#)

Punjab

Drug Units Leave Water Unfit For Use (from [Ajit Seshadri](#), *The Vigyan Vijay Foundation, New Delhi*)

The Water Supply and Sanitation Department notified Toansa villagers not to use water from 200-hand pump by putting a red mark on it. Industrial pollutants from drug units have made the water around the village unfit for consumption. Pollution Control Board issued notices, but none of the businesses causing the pollution took responsibility for the pollution and shifted responsibility to each other. [Read More](#)

Uttar Pradesh

Hazardous Waste Takes Heavy Toll on Life (from [Anuradha](#), *Food and Agriculture Organization of the United Nations, New Delhi*)

Industries in Daurala, located in western Uttar Pradesh are releasing highly toxic untreated effluents directly into land and soil. The toxicity from the effluents has affected the quality of water supply, and the water used for irrigation has shown high levels of heavy metals in the crops. Communities are also facing various health problems. Efforts by Janhit foundation are helping to avert the situation with industries now taking necessary measures of effluent treatment. [Read More](#)

Unknowingly Villagers Fall Prey to Lethal Act of Industries (from [Lata Raman](#), *Jawaharlal Nehru University, New Delhi*)

Sarai-mohana is a village near the meeting of the rivers Ganga and Varuna. Villagers unknowing used the river water, which received a continuous supply of effluents from nearby industries. This led to disastrous consequences for the community's crops and health. The effluents caused a "mysterious weed," to grow in their fields suppressing the growth of crops. To address the problem, the villagers tried to remove the weeds, but after coming in contact the "weed," they were infected with skin diseases and edema.

Gujarat

People around "Golden Corridor" in Pain (from [Vijay Kumar](#), *Chartered Environmental and Water Resources Exploration and Development Associates, New Delhi*)

People living around the 50 industrial estates in the "golden corridor" are coping with extreme amounts of air, water and soil pollution- for example; over 65 groundwater sources are polluted. Hazardous solid waste is dumped on common lands surrounding the industrial estate. Monitoring and regulation by the Gujarat Pollution Control Board is practically non-existent. [Read More](#)

From [Pankti Jog](#), *JANPATH, Ahmedabad*

Soda Ash Industries near Agricultural Fields

The slurry (waste) directly disposed of through open channel from soda ash production is damaging hundreds of acres of agricultural land. In one case, it breached a wall and polluted the Marine National Park at Jamnagar, causing damage to the mangroves and marine life. Industries located near agriculture field are causing havoc during rainy seasons, when all the slurry overflows its channels flows onto agriculture land. [Read More](#)

Cement Industries Reducing Water Retention Capacity of Aquifers

Limestone, the raw material for cement industries, is extracted along the Gujarat coast. Aquifers in the limestone store sweet water; the limestone prevents salt from polluting the aquifer. The extraction of limestone is affecting the water retention capacity of aquifers under the limestone lining and also agriculture activities all along the coast because now the groundwater is saline. [Read More](#)

Salt Industries to Pay for Polluting Land and Water

The process of salt production with due course increases the salinity of land and water affecting the water resources and agriculture produce near its vicinity. Stone pitching which is a mandatory process by these industries to avoid salt intrusion not being followed leading to agricultural land permanently getting saline. With the increasing incidences of salinity, the Gujarat High Court penalized one industry Rs. 30 lakhs to compensate farmers for the loss to agricultural land. [Read More](#)

Use of Contaminated Water for Drinking and Irrigation in Lali Village (from [Ramya Gopalan](#), *Research Associate*)

A DTE/IIT test on a groundwater sample showed the mercury level was 211 times the permissible limit. Red-coloured water was found at a depth of 400 feet, which residents were forced to use. The village is adjacent to a seasonal River Khari that carries only industrial effluent. Because of this contamination, crop production has been reduced to half of what it used to be 30 years ago, from 1,200 kg of paddy to 600-800kg on the same land. Reports of pollution to authorities have been ineffective. [Read More](#)

Small Scale Industries Face Brunt of Pollution Control Board (from [Vijay Kumar](#), *Chartered Environmental and Water Resources Exploration and Development Associates, New Delhi*)

The world famous traditional "Sanganeri" print method is known for its exquisite handblock printed fabrics and azo free dyes. About 75% of the effluent from the printing is discharged into the Guller dam, near Sanganer. The soil in Sanganer is sandy and porous, and thus untreated effluents tend to percolate and pollute the groundwater. The government has issued warnings against consuming vegetables cultivated in areas irrigated with water from the Guller dam. [Read More](#)

Haryana

Pumping of Effluents by Dyeing and Dye Related Operations in Panipat (from [Ramya Gopalan](#), *Research Associate*)

Indian Institute of Technology, Kanpur tested a sample of groundwater from the city of Panipat, and found the mercury level was 268 times the permissible limit for industrial effluents. Preliminary studies on the water samples indicated that its quality was not fit for agriculture or drinking purposes. Industries have stopped introducing of effluents into the local aquifer, but the groundwater remains vulnerable to percolation from highly toxic effluents that run through an open channel in the city. [Read More](#)

Related Resources

Recommended Documentation

From [Sacchidananda Mukherjee](#), *Madras School of Economics, Chennai*

Ground Water Pollution and Emerging Environmental Challenges of Industrial Effluent Irrigation: A Case Study of Mettupalayam Taluk, Tamil Nadu

By Sacchidananda Mukherjee and Prakash Nelliya; Madras School of Economics; March 2006

<http://www.mse.ac.in/pub/mukpra.pdf> (Size: 1.34 MB)

Working paper examines the environmental and socio-economic impacts of industrial effluent used for irrigation

Water Resources, Livelihood Security and Stakeholder Initiatives in a River Basin Context

International Water Management Institute (IWMI), Sri Lanka

<http://www.iwmi.cgiar.org/Assessment/FILES/word/proposals/Project%20Proposals/WaterResources.pdf>

(Size: 315 KB)

Abstract of a study showing how ex-ante adoption of precautionary measures (coping mechanisms) could mitigate the environmental problems related to industrial pollution

From [Murali Kochukrishnan](#), AFPRO, Bhubaneswar

How Coca-Cola Gave Back to Plachimada

By Alexander Cockburn; Counterpunch; April 18, 2005

<http://www.countercurrents.org/gl-cockburn180405.htm>

Outlines the fight by local communities against the giant multi-national company Coca-Cola for the loss to their ecology and livelihood

Justice Denied

By C. Surendranath; India-seminar.com

<http://www.india-seminar.com/2000/492/492%20surendranath%20c.htm>

Examines the disastrous impact of Mayoor industries on the local natural resources and how the continued efforts of the community and panchayats led Myoor closing its operation

The River Noyyal (from [D. Nagasaila](#), Advocate, Chennai and [A Prabakaran](#), Public Action, New Delhi)

Rainwaterharvesting.org and Centre for science and Environment

<http://www.rainwaterharvesting.org/Crisis/river-noyyal.htm>

Looks into the role a vigilant civil society can play in awakening pollution control board to act against polluting industries and make them pay for the losses to the agriculture land

Punjab: Pollution Hits Groundwater (from [Ajit Seshadri](#), The Vigyan Vijay Foundation, New Delhi)

By Padmaparna Ghosh; Central Chronicle; February 1, 2006

<http://www.centralchronicle.com/20060201/0102305.htm>

Provides details on the adverse impacts of industrial pollution from drug companies in Punjab and their refusal to abide to pollution control standards

Daurala Study (from [T. N. Anuradha](#), Food and Agriculture Organization of the United Nations (FAO), New Delhi)

Janhit Foundation

<http://www.janhitfoundation.org/water.htm>

Details the environmental, health and sociological impacts of industries operating in the vicinity of villages and the efforts by Janhit to take ameliorative measures

The Problem of Social Cost (from [Sarbeswara Sahoo](#), Kalpataru, Orissa)

By Ronald H. Coase; Journal of Law and Economics; October 1960

<http://www.sfu.ca/~allen/CoaseJLE1960.pdf> (Size: 772 MB)

Paper examines the actions of businesses which have harmful effects on the general public, like of industrial smoke polluting the environment

Water Fall-Outs (from [A. Prabakaran](#), Public Action, New Delhi)

By Chandra Bhushan; Down to Earth, Centre for Science and Environment

<http://www.cseindia.org/dte-supplement/industry20040215/non-issue.htm>

Looks into the details of water scarcity due to excessive use by industry, resulting in shortages for irrigation purposes, gives examples of specific industries, also examines gaps in water policy

From [Vijay Kumar](#), Chartered Environmental and Water Resources Exploration and Development Associates, New Delhi

Who Bears the Cost: Industrialization and Toxic Pollution in the 'Golden Corridor' of Gujarat

The Indian People's Tribunal on Environment and Human Rights; February 1999

<http://iptindia.org/pdf/Who%20Bears%20the%20Cost.pdf> (Size 232 KB)

Examines effects of indiscriminate industrialization in Gujarat, which have not only destroyed the livelihood sources but also pose a grave threat to the health and lives of residents of the state

Dyeing Out

By Abha Sharma; Deccan Herald; July 6, 2003

<http://www.deccanherald.com/deccanherald/july06/sl5.asp>

Looks into Sanganeri printing process supposed to be a natural process of dyeing whose effluents are still polluting the natural resources and is facing legal action

From [Pankti Jog](#), JANPATH, Ahmedabad

Safe Chemical Zones, a Paradox?

By Vinod Mathew; The Hindu Business Line; November 10, 2003

<http://www.thehindubusinessline.com/bline/2003/11/10/stories/2003111000660900.htm>

Article reports on potential risk of accidents due to the hazardous effluents released by industries in Gujarat and elaborates the actions of the pollution control board to address the problem

Dariya Kinara Samvad Yatra

JANPATH, Ahmedabad

<http://www.solutionexchange-un.net.in/food/resource/res170407.doc>

Note on the changes/diversifications in livelihoods of coastal communities in last two to three decades because of industrialization

Control of Water Pollution from Agriculture - FAO Irrigation and Drainage Paper (from [Gopi Ghosh](#), Food and Agriculture Organization of the United Nations (FAO), New Delhi)

By Edwin D. Ongley; Food and Agriculture Organization of the United Nations, Rome; 1996

Looks into agricultural activities that pollute water - provides interesting information a on aspects of pollution and water quality

From [T. N. Anuradha](#), Research Associate

Industry at Any Cost

Down To Earth; Centre for Science and Environment; April 15, 2000

<http://www.rainwaterharvesting.org/Crisis/Industrial-pollution.htm>

Provides information on the impending danger of industrial growth in Maharashtra and Gujarat, to public health and irresponsiveness of the same from the Government

Industrial Water Vs Drinking Water

By Nityanand Jayaraman; Info Change; October 2005

http://www.infochangeindia.org/agenda3_14.jsp

Looks into unabated release of industrial effluents by textile units, and how its contaminating groundwater used for irrigation, also reviews mitigations measures by pollution control boards

From [Ramya Gopalan](#), Research Associate

Supreme Court Admits Writ against Unsafe Food

Media Room, Press Releases, Toxics Link, New Delhi; April 22, 2003

<http://www.toxicslink.org/mediapr-view.php?pressrelnum=61>

Discusses the writ filed by Srishti, an environmental group which brings to the fore emerging trends and statistics on increased contamination of everyday food items.

What Goes Down Must Come Up

Groundwater Disaster, Rainwaterharvesting.org

<http://www.rainwaterharvesting.org/Crisis/Groundwater-pollution.htm>

Article shares experiences of studies and investigations undertaken on groundwater pollution in industrial areas indicating its unfit nature for agriculture and drinking water purposes

Recommended Contacts and Experts

From [Inder Abrol](#), Centre for Advancement of Sustainable Agriculture, New Delhi

Dr. P. S. Minhas, Assistant Director General (Water Management); Indian Council of Agricultural Research, New Delhi

Krishi Anusandhan Bhavan II, New Delhi 110012; Tel: 91-11-25848370; psminhas@icar.org.in

Extensively worked on soil salinity and alkalinity problems in India and use of saline water in agriculture

Dr. Gurbachan Singh, Director; Central Soil Salinity Research Institute, Karnal

Kachawa Road, Karnal 132001; Tel: 91-184-2290501; director@cssri.ernet.in

Developed approaches to sustainable use of soil resources whose productive capacity has been diminished due to the accumulation of excess salts in the root zone.

Recommended Organizations

Centre for Science and Environment, New Delhi (from [A Prabakaran](#), Public Action, New Delhi)

41, Tughlakabad Institutional Area, New Delhi 110062; Tel: 91-11 29955124; cse@cseindia.org; www.cseindia.org

Independent, public interest organisation with one of its aims to increase public awareness on industrial pollution and its socio-environmental impacts

Janhit Foundation, Meerut (from [T. N. Anuradha](#), Food and Agriculture Organisation of the United Nations (FAO), New Delhi)

D-80, Shastri Nagar, Meerut 250002; Tel: 91-121-2763418; info@janhitfoundation.org; www.janhitfoundation.org

Conducts research, campaigns, grass-root level practical work and advocacy on issues related to environment, industrial pollution and human rights

Related Past Consolidated Replies

[Redressal of Environmental Health issues in Agriculture](#), from S. S. Kandagal, APFAMGS, Hyderabad (Advice). Food and Nutrition Security Community. Issued 15 December 2005

Practical ways to create awareness, concerted action programmes and policy measures that address indiscriminate use of pesticides in agriculture.

[Treatment of Wastewater for Reuse](#), from K. A. S. Mani, APFAMGS, Hyderabad (Experiences).

Water Community. Issued 14 March 2006

Explores range of approaches in wastewater treatment covering small household level treatment devices, middle range technologies and large intensive solutions

[Setting Norms for and Treating Polluted Irrigation Water](#), from Abhay Kumar, Toxics Link, New Delhi (Experiences; Advice). Food and Nutrition Security Community and Water Community. Issued 29 March 2007

Discusses various treatment techniques and suggests possible institutional and other interventions to address the problem of treating polluted irrigation water

Responses in Full

[Sacchidananda Mukherjee](#), Madras School of Economics, Chennai

Thank you very much for raising the crucial issue on the forum. Please find the abstract of the study that we have conducted recently in Mettupalayam taluk, Tamil Nadu, titled - Groundwater Pollution and Emerging Environmental Challenges of Industrial Effluent Irrigation in Mettupalayam Taluk, Tamil Nadu.

The abstract goes like this:

Industrial disposal of effluents on land and subsequent pollution of groundwater and soil of surrounding farmlands – is a relatively new area of research. Environmental and socio-economic aspects of industrial effluent irrigation have not been studied as extensively as domestic sewage based irrigation practices, at least for a developing country like India. Disposal of effluents on land has become a regular practice for some industries. Industries located in Mettupalayam taluk, Tamil Nadu dispose their effluents on land, and the farmers of the adjacent farmlands have complained that their shallow open wells get polluted and also the salt content of soil has started building up slowly. This study attempts to capture the environmental and socio-economic impacts of industrial effluent irrigation in different industrial locations at Mettupalayam taluk, Tamil Nadu through primary surveys and secondary information.

This study found that continuous disposal of industrial effluents on land, which has limited capacity to assimilate the pollution load, has led to groundwater pollution. Groundwater quality of shallow open wells surrounding the industrial locations has deteriorated, and the application of polluted groundwater for irrigation has resulted in increased salt content of soils. In some locations drinking water wells (deep bore wells) also have high concentration of salts. Since the farmers had already shifted their cropping pattern to salt tolerant crops (like jasmine, curry leaf, tobacco etc.) and substituted their irrigation source from shallow open wells to deep bore wells and/or river water, the impact of pollution on livelihood was minimised. An earlier version of this paper can be downloaded from <http://www.mse.ac.in/pub/mukpra.pdf> (Size: 1.34 MB)

Since the local administration is supplying drinking water to households the impact in the domestic sector has been minimised. It has also been noticed that in some locations industries are supplying drinking water to the affected households. However, if the pollution continues unabated it could pose serious problems in the future.

In response to the issues raised in this study and by the NGOs, the Tamil Nadu Pollution Control Board (TNPCB) constituted a Local Area Environmental Committee (LAEC) to monitor the polluting industries located in Mettupalayam taluk. The responsibility of the LAEC is to monitor the operation of the effluent treatments plants of the industrial units and their level of compliance with the prescribed standards, and suitably advise the Pollution Control Board to take necessary action. The formation of the committee made the process more transparent and the Board more accountable to the public. However, farmers and representatives of the local NGOs are not satisfied with the way the LAEC has been functioning since its constitution (November 1, 2005), and demanding for permanent LAEC for the region.

This study has been undertaken as a part of the project on "Water Resources, Livelihood Security and Stakeholder Initiatives (<http://www.iwmi.cgiar.org/Assessment/FILES/word/proposals/Project>)

[Proposals/WaterResources.pdf](#)) in the Bhavani River Basin, Tamil Nadu, funded under the "Comprehensive Assessment of Water Management in Agriculture" program of the International Water Management Institute (IWMI), Sri Lanka. The study shows that environmental impacts of industrial effluent irrigation is different for different sites, which is mainly due to the fact that different industries have different pollution potential; and different locations have different assimilative capacities to absorb the pollutants.

Since the farmers had already shifted their cropping pattern to salt tolerant crops and/or substituted their irrigation source(s) from open wells to deep bore wells and/or the Bhavani river water, most of the farmers are able to cope to a large extent with the pollution of the ground water and hence their livelihoods are not significantly affected. This shows that availability of coping options play a crucial role to mitigate pollution problems, however the degree of severity of the pollution is also a crucial factor which determines the feasibility to adopt averting behaviour. This study shows that *ex ante* adoption of precautionary measures (coping mechanisms) could mitigate the environmental problems related to pollution.

[Inder Abrol](#), Centre for Advancement of Sustainable Agriculture, New Delhi

Indian Council of Agricultural Research has research program in the area of Water Quality, Pollution etc in relation to crops, soils.

The contact points are:

Dr. P S Minhas

Assistant Director General

email: psminhas@icar.org.in

Dr. Gurbachan Singh,

Director

Central Soil Salinity Research Institute, Karnal.

email: director@cssri.ernet.in

[Sarbeswara Sahoo](#), Kalpataru, Orissa

Gamana has pointed out a very important problem faced by any society. This is one of the many such problems like global warming climate change, where act of one agent affect the live and livelihood of the other who are no way responsible for the act. In this case the farmers are no way responsible for the ground water pollution done by the concerned industry. This phenomenon is growing with multiplication of industrialisation in India. This social problem has to be solved. For an interesting discussion, the famous article by Nobel Laurate Ronald Coase; "The Problem of Social Cost"(1960) (<http://www.sfu.ca/~allen/CoaseJLE1960.pdf>) would prove valuable.

[Murali Kochukrishnan](#), Action for Food Production (AFPRO), Bhubaneswar

Industrial water use has triggered quiet an array of problems in the present day's scenario. Tensions are particularly high in water-scarce areas where domestic, agricultural and industrial water needs are over ridden against each other. Even today, most of the big metros in India e.g. Chennai, Bangalore, Coimbatore etc. are getting piped water supply from far-off places. This certainly puts tremendous pressure on the local rural population whose water is being snatched to feed the urban elites and

industrial growth. I would like to quote an experience from my home town of Palakkad District in Kerala, on how the community joined hands to get rid of the multinational company named coco cola.

The company came with glittering offers like many job opportunities in the plant; overall development of the Plachimada village, strengthening the economic growth of the area. The community patiently waited for the reforms; on the contrary the people started facing the reverse effects. The water level in the wells of the surrounding colonies showed a sharp depletion. The quality of the water- its odour, taste, hardness- got worsened. It became non-potable. The communities were forced to fetch water from a distance of three to five kilometers. The farmers around the plant stopped cultivation due to severe shortage of water leading to forced distress migration to far off areas in and around Palakkad District and the neighboring regions of Pollachi in Tamil Nadu state in search of livelihood.

Suddenly the community of Perumatty Panchayat felt that who will compensate the heavy loss incurred upon the natural resources by Coco-cola giant plant. These villagers, mostly schedule castes and schedule tribes are predominantly landless agricultural labourers living at the brink of acute poverty, hunger, diseases, lack of pure drinking water and many other grave ecological hazards. The major calamity caused by the functioning of the company is on the economic system of Plachimada that created acute non-availability of job opportunities and change in labour patterns around.

The surveys carried out by several developmental agencies clearly show that there was a sharp decrease in the agricultural production since, the company started its functioning. The paddy production has almost come to a standstill whereas the production of coconut and vegetables decreased below half times. The toxic materials found in the solid waste had entered into the ecosystem and as a result into the human body system also. The health problems created due to the presence of toxic substances like lead and cadmium are many.

The entire Panchayat joined hands and started taking legal and rights based approach to curtail the company's activities under various purviews. The community confirmed that the very existence of the plant itself was an illegal aspect and against the land utilization act of Kerala government -1967 which clearly indicates that the productive agricultural lands cannot be converted for any industrial usage until or unless the land is left fallow for 3 years with out cropping. This aspect of legality gives further thrust to the movement. The peoples movement got authentic support by few experts study opinion by senior technologist like Dr. Achuthan a noted hydro-geologist, who scientifically proved that the crux of the issue is that the extraction is from the deeper aquifer, whereas the recharge goes up to the gravity zone only. Therefore, the pumping done by coco- cola causes depletion of ground water extensively and over exploited the ground water regime of the region. The toxic waste from the plant was heavily dumped into the agricultural fields making the poor and innocent farmers of the place to believe that the sludge is of high quality manure. This had polluted the soil and the ground water sources to a greater extent. Tests revealed that the material supplied as a fertilizer was useless and it contained a number of toxic metals, including cadmium and lead. This has also aggravated the movement to gain momentum and urge.

The 15-member Panchayat used its necessary discretionary power and did not renew the license issued to the factory on the ground of "protecting public interest", as the company was "causing shortage of drinking water in the area through over-exploitation of ground water sources". The copy of the decision was communicated to the Chief Minister, the Minister for Industries, the opposition leader, the District Collector, and the Deputy Director, Local Self Government Department, Govt. of Kerala. Subsequently, the panchayat also issued a show-cause notice to the company on 09.04.2003, granting the company 15 days (i.e., upto 24.04.03) to reply to the notice. Along with this several movements against the denial of right to water, denial of the right to livelihood, causing pollution, cheating the farmer, violation of Kerala Land Utilization Act, violation of Ground Water Rules, violation of Human Rights and Women's Rights – causing health hazards. This made the government to totally ban COCO COLA in Kerala.

This clearly states that people oriented approach with the political intervention in both civil society and state will make more people-centered approach for sustainable protection of common property. The political aspect is extremely significant in such movements.

Another good experience also exists in the Kozhikode district of Kerala where, the community movement made the Mavoor Rayons factory to close down permanently with both political and civil society intervention.

A. Prabakaran, Public Action, New Delhi

Glad to hear Gama's efforts to prevent industrial dumping and pollution. The dumping of industrial waste is common across the country. Wherever heavy and medium industries are present, diseases and malfunctioning of vital body parts are very high. For instance, the chemical waste from textile industries in Tirupur in Tamil Nadu has polluted the local rivers and water bodies and caused irreparable damage to agricultural fields. There is a continuous effort going on by the local groups to seek compensation through legal interventions. In Ganga and Yamuna flowing areas in North India everyday there is tension and violence due to industrial waste dumping.

For more details, legal advices check Down to Earth (<http://www.downtoearth.org.in/magazine>). Our organisation Public Action assures all sort of assistance in this matter.

D. Nagasaila, Advocate, Chennai

As pointed out by Prabakaran the farmers in Noyyal river Basin and Amaravathy river basins in Tamil Nadu filed cases for compensation against all the textile and dyeing industries in that area before the Loss of Ecology Authority constituted by the Central Government pursuant to Supreme court orders in Vellore Citizens forum case. The authority in turn appointed Centre for Environmental Studies, Anna University to assess and quantify the damages to agricultural productivity. The Anna University had taken water samples measured the electrical conductivity to assess the salinity levels and there after assessed the loss of agricultural productivity by using data of agricultural productivity for the pre pollution years. A total compensation of Rs. 24 crores for damage to over 28,000 hectares of land was given in respect of Noyyal Basin alone. Petitions seeking enhancement of compensation are currently being heard by the Madras High Court.

I am a lawyer appearing on behalf of some of the farmers. I am sure similar compensation can be claimed by farmers in Andhra.

Rajagopalan Jagannathan, FABCON Engineers (P) Ltd, Chennai

When a unit is being started, the concerned authorities should ensure the problems likely to arise or the entrepreneur should be aware of the problem likely to arise at a later stage due to pollution. Absolutely, it is in our hands. Now a days, one is supposed to get a clearance from pollution control board even for ordinary Fabrication Industry wherefrom no pollution is emitted.

The entrepreneurs will have to be doubly careful so that they do not put the Government into problem which lasts for only 5 years, whereas the entrepreneur lasts for ever.

Surendra Kumar Yadav, National Institute of Health and Family Welfare, New Delhi

As Nagasaila has said, compensation may be obtained by affected farmers through Writ Petition (civil) that may be filed directly to the Honorable High Court under Article 226 of the Constitution of India. Affected villagers can appoint an Advocate and can get compensation and further Orders/ Directions to control pollution in future. When State Pollution Control Boards are not supportive, knocking the door of the Honorable High Court by affected farmers is a viable option.

Ajit Seshadri, The Vigyan Vijay Foundation, New Delhi

This indeed is an eye opener to many. Under the pretext of backward areas development in Punjab many pharmaceuticals have established their industries and have literally wiped out sustenance of villagers due to ground water pollution. All Government has done is to put a red cross mark with indications that villagers not to use hand pump water. The districts if I remember correct are Hoshiarpur, Gurdaspur and many more. Some incidence of ground water pollution is seen at industrial belts at Baddi, near Chandigarh in Haryana.

Our NGO had done rain harvesting with recharge to ground water in one of the plants and did awareness camps but the administration has been very slow in taking pre-emptive actions, I wish appropriate sense prevails and nature with people are protected.

T. N. Anuradha, Food and Agriculture Organization of the United Nations (FAO), New Delhi

The case of industrial pollution in Daurala located in western Uttar Pradesh where highly toxic untreated effluents released from industries and used as irrigation water is spelling a slow death for 18,000-odd residents of Daurala village-cum-industrial estate.

Study conducted by Janhit Foundation (<http://www.janhitfoundation.org/water.htm>) with technical assistance from the Indian Institute of Technology, Roorkee, the levels of dangerous elements in drinking water, agriculture soil and sludge of the area are high enough to put Daurala among the top 50 most polluted habitations in the country. A survey by the Foundation volunteers has revealed presence of alarming levels of heavy metals like arsenic, lead, aluminium and lethal compounds like cyanide in the drinking water, waste water, agriculture soil and sludge samples.

Vijay Kumar, Chartered Environmental and Water Resources Exploration and Development Associates, New Delhi (response 1)

Thanks to Saugat and others sharing for their views. Our "Industrial Stalwarts", must have not spared any place to pollute the basic resources, like soil and water.

General Electric's (GE) one of the bulb manufacturing plants on national high between Ahmedabad and Baroda near Nanded, a heavy tungsten pollution had shown its color in mid 1980's. All villages were forced with deep red colour water for irrigation, which was full of heavy metals.

Ankleshwar (<http://www.indiatogether.org/stories/gidcpss.htm>) is another example in Gujarat.

Near Jaipur the color printing by "Sangeneri traditional method" the traditional method of dying is polluting the groundwater. I wish some treatment is done for removal of dyes from colour textile wastewater by orange peel.

I wish let our law of land be in place to tackle such issues, getting studies is not the solution but care and remedial action should be next action by us all those involved in such studies.

Some Low-cost Adsorbents for Treating Waste Waters are:

- Bio-absorption of cadmium by green coconut shell powder
- Treating wastewaters laden with heavy metals by orange peel
- Removal of dyes from colour textile wastewater by orange peel
- Non-conventional adsorbents like fly ash, peat, lignite, bagasse pith, wood, saw dust etc. have attracted the attention of several investigations and adsorption characteristics have been widely investigated for the removal of refractory materials for varying degree of success.
- Fly ash based low cost method for Chemical Oxygen Demand removal from domestic waste water

I think even today while going through examples mentioned by Ajit, Prabakaran, Yadav, Anuradha, and many more are very painful to read. I wish such know how be disseminated by all among effective people

[Ramesha Gowda](#), Karnataka State Pollution Control Board, Bangalore

In the Constitution of India it is clearly stated that it is the duty of the state to 'protect and improve the environment and to safeguard the forests and wildlife of the country'. It imposes a duty on every citizen 'to protect and improve the natural environment including forests, lakes, rivers, and wildlife'. Reference to the environment has also been made in the Directive Principles of State Policy as well as the Fundamental Rights.

So please go ahead and hire a good lawyer and approach court. There are numerous laws in this country which will also help you in fighting the case.

[Lata Raman](#), Jawaharlal Nehru University (JNU), New Delhi

On seeing the query posted by Mr. Saugat Ganguly about 'impact of industrial pollution of ground water on agriculture', I was reminded of the plight of people of village 'Sarai-mohana' in Varanasi. The village is situated at the meeting point of rivers Ganga and Varuna. There is a big drain carrying industrial & city waste into Ganga which passes through the village, even the Varuna River has been turned into a big drain.

Unknowingly, villagers started irrigating adjacent land with drain water-thinking that they were putting the polluted drain to better use. Due to this their fields burgeoned with a mysterious weed which suppressed the crops. When some of them tried to clean the weed, they were infested with skin diseases and edema. When I saw them they were in very painful condition. I have since shifted to Delhi and therefore not met them.

Above is a case of fertile land going waste along with a health hazard immobilising the working population due to untreated industrial effluents in the river/ground water. As per the policy suggestions I would have the following to say:

- Water treatment techniques to be scaled down and villagers to be trained in the same
- All industries to pool in money to meet the expenses of water treatment & salary to the villagers engaged in the treatment plant
- Proportion of monetary contribution according to the volume and intensity(tough/light) of pollutants produced
- Selection of villagers for engagement in the plant from among all villages through which the drain passes not according to proportion of area falling in the catchment but the share of the village where the plant is located to be more in proportion to the land that is given away to the plant
- Treated water to be shared for irrigation equally

- Adequate local laws & bylaws to be framed with the participation of the villagers
 - NGO's to mobilise & sensitise the people about the whole issue
-

H. S. Sharma, Independent Consultant, Gurgaon (response 1)

The reality of ground water pollution is very harsh. I was with the Haryana State Council of Science and Technology Chandigarh as chief engineer. My friend Dr. Chaudhry was director Christian Medical College Hospital (CMCH) Ludhiana; I had requested him to find out why should any body come to a hospital. We analysed the Out Patient Department (OPD) card and came to the conclusion that 50% of people visiting CMCH were suffering from stomach ailment. This was because Punjab grows rice and wheat and uses excess urea, which percolates to the ground water. When the water is used as drinking water, the sodium nitrate is converted to sodium nitrite by the bacteria active in stomach, which corrodes the stomach lining. In India Andhra is first in stomach ulcer cases because they consume excess chilly. The second place goes to Punjab because of Urea

Ridhima Sud, Development Alternatives, New Delhi

The levels of metals in all environments, including air, water and soil are increasing, in some cases to toxic levels, with contributions from a wide variety of industrial and domestic sources

Heavy metals are dangerous because they tend to bioaccumulate. Bioaccumulation is a process in which chemical substances are concentrated, accumulated and magnified in the body tissue of living organisms either directly from surrounding environment or indirectly through the food chain. The increasing contamination of aquatic water bodies with pollutants bearing trace metals cause deleterious impact not only on the immediate aquatic ecosystem but also on the well being of human population.

Industrial pollution affects water quality in many ways i.e., dissolved oxygen, temperature, pH etc. Some industrial effluents cause toxicity. Large and medium industrial units - 22 in Haryana, 42 in Delhi and 17 in Uttar Pradesh have been identified as directly discharging and polluting the Yamuna under the Action Plan (<http://yap.nic.in/>) area. These industries include paper, sugar, chemical, leather, distillery and pharmaceuticals. The industries are contemplating to adopt adequate pollution control measures under the existing environment laws to ensure that treated effluent conforming to the prescribed standards should only be discharged into the river.

As far as India is concerned the bio-magnification processes in the aquatic food chain has not been clearly mapped. Erratic release of unsafe concentration of heavy metals along with high summer temperature and anoxic conditions of Yamuna river is really a matter of serious concern. Biomonitoring processes to quantify bioaccumulation rate have become an inevitable necessity for water quality management study.

Gopi Ghosh, Food and Agriculture Organization of the United Nations (FAO), New Delhi

Control of water pollution from agriculture - FAO irrigation and drainage paper (<http://www.fao.org/docrep/W2598E/w2598e00.htm>) - though looks into agricultural activities that pollute water through the use of fertilizers, pesticides, livestock, processing etc - provides interesting clues on the whole aspect of pollution and water quality - many of them are worth considering for national policy formulation. Some of the broad adverse impacts as reflected in the paper are - ecosystem dysfunction and loss of biodiversity; contamination of marine ecosystems from land-based activities; contamination of groundwater resources; contamination of river system resulting in huge loss in

livelihoods. Because of pollution, there is decline in sustainable food resources (e.g. freshwater and coastal fisheries) ; poor water resource management decisions because of inadequate water quality; inability to manage pollution by dilution leading to higher levels of aquatic pollution; escalating cost of remediation and potential health risks to human, animal and other living resources.

There is need for integrated water resources management for national policy goal. The environmental impacts on water resources require monitoring, and preventive measures with systemic integration. It is necessary to develop and implement water resource monitoring systems with a prior definition of indicators, parameters, tolerance limits, frequency and sampling points, combining this information with quantitative data (e.g. Bioassay, Biotic Indices, Ecosystem indicators, Chemical Indicators).

Besides water quality related problems, there is need for conflicts resolution, particularly integrating quality management with the quantity of water within a comprehensive, decentralized and participatory management system, reconciling development with environmental protection. Cooperation of agencies dealing with toxic substances with the capacity for control structures, development of biological indicators (enzymes, AMES test, bio-testing, bio-indicators) of residues and of anatomy and pathological damages caused by toxic substances. Data and information generated should be properly disseminated in order to heighten awareness and mobilization of the public sector and of society regarding its impact on the environment. Moreover information and experiences must be exchanged across as well as building horizontal cooperation among countries.

Some other suggestions are: need for looking into unsafe groundwater supplies in rural areas; identification of appropriate technology for handling of wastewater from industry complexes; prevention of groundwater pollution from municipal waste water and industrial effluents; policies related to the use of surface water linked with pollution and dilution requirements during periods of low flow; financing and implementation of municipal waste treatment to recommended standards; collection/treatment of industrial/urban rainwater runoff; improvement of poorly managed solid waste dumping sites; consideration of step-wise, time-targeted implementation of industrial effluent standards; need to consider economic and social consequences of effluent standards and water quality objectives; access to clean technology for safe disposal of waste by the industry; tackling inefficiency and operational problems of industrial and municipal waste water treatment facilities; consistency in water protection and general environmental health policies; responsibility, ownership and mechanisms for certification, accreditation and control of water quality laboratories (environmental, hygienic, law enforcement and scientific purposes); generation of relevant data for assessment and water quality monitoring programmes.

There is an urgent need to deploy new techniques in environmental chemistry and toxicology for more cost-effective determination of water quality problems compared to the existing physico-chemical measurements. Making use of modern screening techniques to activities like - standardized laboratory bioassays, immunoassay, measures of fish health, use of enzyme measures to determine exposure of aquatic elements to toxic chemicals, measures of total chlorine and Toxicity Identification Evaluation is critical. We must also strictly enforce the "polluters pay" principle as a strong disincentive for anything that attempt to destroy our precious water resources.

H. S. Sharma, Independent Consultant, Gurgaon (*response 2*)

The pollution created by the industry is not properly treated, if treated at all. A short cut has been found by bypassing the statutory body like pollution control board.

The industries in Gaziabad and many other places simply dig a hole in the factory premises and insert a 6 inch to 10 inch pipe which is connected to a high pressure pump which are readily available and against all rules the waste water of the factory is pumped to the underground, resulting in people who are forced to live near factories getting multi-colour water from their hand pumps.

Same story is repeated at the textile cluster in Sangeneri (Jaipur) a place for dyeing and printing units

Vijay Kumar, Chartered Environmental and Water Resources Exploration and Development Associates, New Delhi (response 2)

I noted your concern that people visiting Christian Medical College Hospital (CMCH) Ludhiana were suffering from stomach ailment due to drinking water with high nitrate content and the reason is use of excessive urea in Punjab for rice and wheat production.

The formation of nitrates is an integral part of the nitrogen cycle in our environment. In moderate amounts, nitrate is a harmless constituent of food and water. Plants use nitrates from the soil to satisfy nutrient requirements and may accumulate nitrate in their leaves and stems. Due to its high mobility, nitrate also can leach into groundwater. If people or animals drink water high in nitrate, it may cause methemoglobinemia, an illness found especially in infants.

Groundwater of top phreatic aquifer in most of the places is getting degraded due to industrial effluents which are disposed off without treatment.

- The groundwater in Ludhiana city has high concentration of hexvalent chromium, cyanide, nickel etc. (Singh et.al1993).
- Groundwater in Amritsar city shows high pH, Total Dissolved Solids (TDS), total hardness and nitrate.
- Groundwater in Ropar district is locally polluted at Toansa and Nangal due to disposal from highly polluting industries (Anonymous, 1995).
- Groundwater from shallow hand pumps shows and high TDS (8697 mg/1), high total hardness (1616 mg/1) and high fluoride concentration (over 1.5 mg/1).
- Groundwater from Patiala district also shows locally high TDS.

I suggest let SONO be promoted with modified version in Punjab region. If correctly understood, the Sono filtered water removes iron, manganese, heavy metals, nitrate, nitrite and many anions. This filter was developed Prof. Abul Hussam through Kushtia based NGO in Bangladesh.

However, for more details you may check with [Prof. Abul Hussam, Department of Chemistry and Biochemistry, George Mason University \(ahussam@gmu.edu\)](mailto:ahussam@gmu.edu)

Pankti Jog, JANPATH, Ahmedabad

I would like to share our experience in Gujarat, about impact of Industrial Pollution on Agriculture. Gujarat is one of the leading states in industrialization, with mainly chemical, salt, soda ash, petroleum industries.

Salt Industries

Salt is produced on large scale by multi national companies in Gujarat. The saline water of the sea is stored in huge ponds called as Talao for evaporation to form salt. The saline water increases the salinity in land and water, there by damaging water resources and agriculture. The seepage rate from the ponds is very high as industries do not do stone-pitching along the side of the ponds (which is mandatory condition in the lease when government allots the land for salt production). The agriculture land gets saline permanently. The land is then purchased by the industries at lower rates. This is the usual trend in Gujarat all along the coast. Recently Gujarat High court has put a penalty of Rs. 30 lakhs to one of the industries as compensation for polluting land and water in the locality of salt production areas.

Some photographs are uploaded on the link: <http://bhopal.net/opinions>

Documents of Impact of Salt Industry can be viewed from below links

1. [Disastrous effects of TATA chemicals Mithapur on Okhamandal](#)
2. [Disastrous effects of TATA chemicals Mithapur on Okhamandal 1](#)
3. [Disastrous effects of TATA chemicals Mithapur on Okhamandal 2](#)
4. [Disastrous effects of TATA chemicals Mithapur on Okhamandal 3](#)
5. [Disastrous effects of TATA chemicals Mithapur on Okhamandal 4](#)

Soda ash industries

It is again usual practice by all leading industries in Gujarat involved soda ash production that the slurry (waste) is disposed through open channel, which most of the times overflows and damages the agriculture land on its sides. In rainy season the channel is filled with rain water, which overflows along with slurry into the fields on both the sides. In Jamnagar, junagadh district, hundreds of acres of agricultural land have been polluted by wrong way of disposing industrial waste. There is no regulation or monitoring on such practices by the state government.

Cement industries

Along the coast of Gujarat, there is plenty of limestone, which is used as raw material for cement industries. Aquifers in the limestone stores sweet water there by prohibiting salinity to intrude in. this limestone barrier along the coast of Gujarat, is vessel of water recharging and storage which is presently removed by mining. This has badly affected agriculture all along the coast of Gujarat. Saline water is intruding in. Synopsis of the study "[Dariya Kinara Samvad Yatra](#)" – [report of exposure visit along the coast of Gujarat](#) conducted by JANPATH on this issue is attached. Such an activity should be treated as polluting agents as it pollutes ground water.

Please contact us for further details

[R. Srikanth](#), WaterAid, New Delhi

We have an ambitious National water policy 2002, which takes into account of all these factors and concerns shared by our friends. Under National water policy following component on water quality is listed:

- Both surface water and ground water should be regularly monitored for quality. A phased programme should be undertaken for improvements in water quality.
- Effluents should be treated to acceptable levels and standards before discharging them into natural streams.
- Minimum flow should be ensured in the perennial streams for maintaining ecology and social considerations.
- Principle of 'polluter pays' should be followed in management of polluted water.
- Necessary legislation is to be made for preservation of existing water bodies by preventing encroachment and deterioration of water quality.

The problem is related to implementation where we have failed inspite of various governmental institutions responsible for it. Legal instruments are long drawn process and civic groups do not have sustained resources to sustain activism. Monitoring mechanisms often deals with outdated physico-chemical parameters like Biological Oxygen Demand and Chemical Oxygen Demand levels and seldom deal with bioassay test /toxicity test. Many a times there is gross violation of standards, which is overlooked for the sake of convenience. Small scale industries do not have fund to commission Effluent Treatment Plant (ETP).

Even in case of large industries the operation and maintenance of various ETP is major issue and my experience in patancheru and other industrial township is that the majority of commissioned ETP is not operational because of cost involved in running these plants. This is also true with Common Effluent Treatment Plant (CEPT) also and therefore illegal dumping of hazardous waste is major concern affecting ground water. In my opinion civic institution /NGOs should play a vital role in associating in operations and management of ETPs, Sewage Treatment Plants (STP), CETPs and work as watchdog in regulating the safe disposal of waste as per various prescribed norms of regulating agencies. This way NGOs can play a positive role in pollution abatement.

Many thanks to all who contributed to this query!

If you have further information to share on this topic, please send it to Food and Nutrition Security Community and Solution Exchange for the Water Community at se-food_se-wes@solutionexchange-un.net.in with the subject heading "Re: [se-food][se-watr] Query: Impact of Industrial Pollution of Ground Water on Agriculture- Experiences. Additional Reply."

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