

**WHO BEARS THE COST: Industrialisation and Toxic
Pollution in the 'Golden Corridor' of Gujarat**

Tribunal headed by:
Justice. Hosbet Suresh
(Retd.Judge, Bombay High Court)

February 1999

The Indian People's Tribunal
on Environment and Human Rights

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INTRODUCTION

The Indian People's Tribunal on Environment and Human Rights (IPT) was launched on June, 5 1993 at a national conference on 'Human Rights, Environment and the Law', held in Bangalore. The mandate of the IPT is to highlight environmental and human rights violations both by the state and private parties and give voice to the struggles of grass root organisations and affected communities. The IPT is usually headed by a retired High Court Judge assisted by a panel of experts on the issue under investigation. Today, the IPT has developed into a credible instrument for the immediate redressal of grievances of the affected persons as well as effecting long term changes in policy and programs to make them more people friendly and ecologically sensitive. In the enquiries conducted so far the IPT has endeavoured to place before the public and the authorities a factual picture of the ground realities, based on objective investigation by experts. Evidence is gathered through field visits of the affected areas, collection of testimonies of various sections of the local population and interviews with the opposite side wherever possible. The idea is to give a fair chance to all sides before coming to a conclusion which is usually done at the end of a public hearing.

The IPT enquiry into the toxic and hazardous industrial pollution in the so called 'Golden Corridor' stretching from Vapi in district Valsad, to Nandesari in district Baroda, in the State of Gujarat was held in response to a request from Paryavaran Suraksha Samiti, Vadodara Kamdar Union, Vyavasaik Swastha Samiti and other concerned individuals and organisations active in the area.

The IPT enquiry was headed by Justice Suresh, retired High Court Judge assisted by a panel of experts. The eleven member team visited various areas to examine effects of indiscriminate industrialisation and the resultant pollution of air, water and land by noxious gases, toxic chemicals effluents and other hazardous substances which have not only destroyed the livelihood sources of the local population but also pose a grave threat to their health and life. In addition the IPT also enquired into the occupational safety of workers in some specific industries where blatant violations of safety norms have caused serious damage to the workers' health.

Of the approximately 90,000 industries in Gujarat, 8,000 are highly polluting chemical industries. Of these 850 are large and medium scale industries who have the equipment to treat their effluents but prefer to dump them irresponsibly because of the high costs involved in effluent treatment. The workers in these industries, most of whom are migrants, live in the immediate vicinity of the factories. In addition to the exposure to hazardous substances in the work place, they and their families are the worst affected by environmental pollution caused by the factories.

During the visit of the IPT team to the affected areas the workers and the local population complained of asthma, cancer, infertility and related problems. Corrosion of fingers, toes and perforation of the nasal septum (wall separating the nostrils), skin irritation and other related health problems. The local population in all the industrialized areas has recorded a loss of livelihood due to a substantial fall in agricultural and horticultural production and loss of fish, especially in the inland water bodies. The most serious problems in all the area is the widespread contamination of ground water leading to an acute shortage of drinking water. It was admitted by the authorities that due to the excessive exploitation of fresh water for industrial proposes there is an acute shortage of water for agriculture and the farmers are forced to access water from the effluent channels for irrigation leading to toxic and hazardous organic compounds being absorbed in the food chain. Ironically the growth of the corridor has been simultaneous with the slow poisoning of the land, air water, the people, animals, flora and fauna of the area.

Procedure

Social scientist Shiraz Bulsara co-ordinated the inquiry on behalf of the IPT. One group of experts visited the industrial complexes, the Effluent Channel Project and the surrounding villages in Baroda and Nandesari and the other group visited Vapi, Valsad and Ankleshwaer and the GIPCL mines near Mangrol in Surat district. A public hearing was held on 24th January, 1999 at the Premananda Sahitya Hall, Baroda. The hearing was well attended by the general public from the affected areas as well as a large number of concerned citizens from Baroda, Ahmedabad and Surat. Representatives of the industries and the government (respondents to the petitions) turned up for the public hearing to put their say on record and they were given a fair chance to represent their point of view.

The deliberations of the day long sitting of the tribunal raised many basic issues regarding the disposal of toxic industrial waste. The informed and incisive cross-questioning by the panel of experts led to the conclusion that the problem of toxic pollution in the golden corridor has assumed unmanageable and dangerous proportions. In his concluding remarks Justice Suresh summed up the recommendations of the panel saying that there should be a complete moratorium on starting new industries in the so called golden corridor as the environment has been pushed far beyond its natural carrying capacity to cope with toxic waste. Some industries which produce toxics for which there is no known scientific method of disposal must be closed down immediately and stringent pollution control norms should be applied to other industries. Taking into consideration the plight of the workers and the affected communities, Justice Suresh mentioned that remedial measures should be undertaken on a war footing and noted that lack of funds can never be an excuse to abrogate responsibility towards ensuring the safety of workers and the life and livelihood of the affected communities.

BACKGROUND

A broad picture of growth of the chemical industry:

The chemical industry has significantly developed during the past couple of decades in the country. When it began during post-Independence, the chemical industry was restricted to manufacturing simple chemical products made from technology imported from the West. Today, Indian chemical industry is in a position to export not only its products but also its technology to other countries.

After iron and steel, engineering and textiles, the chemical industry is the fourth largest in terms of scale of the operation. Its growth saw its peak in the eighties and was said to be the highest compared to all other industries in the country. From simple products, the industry has today graduated to producing vital raw material for many a consumer goods manufacturer, and from this point of view plays a pivotal role in the country's industrialisation.

According to an estimate by the Centre for Monitoring Indian Economy, the industry accounts for 7% of the total factories, 12% of the fixed capital, 13% of the gross output, 12% of the net value added in the manufacturing sector and also makes for 15% of gross industrial production. In terms of international trade also the Indian chemical industry has performed well in the last few years. The average growth rate of the industry is 9% per annum as compared to 6% overall average growth rate in the manufacturing sector. Total exports of chemicals rose from Rs.23,780 crores in 1990-91 to Rs.58,607 crores in 1994-95 which shows a growth of 25%. It is estimated to cross the Rs.100,000 crore mark soon.

But at the same time, the industry has become a major area of concern because of its serious environment fallout. What is depressing, however, is the fact that the darker side of industrial growth is often glossed over for sheer growth. Environmental care and the backup official machinery for it has not been given as much attention as is given to sprucing up government departments for a quick transition to haphazard industrialisation.

In this context, Gujarat assumes significance not only for its industrial growth but also for its environmental neglect. The State has made rapid strides in the industrial sector, with chemical and related industries playing a dominant role. During the last two decades, Gujarat has emerged as one of the major players in the country's industrial arena. An entire industrial belt gradually developed from Mehsana in the North, to Vapi in the South, which was later christened as the Golden Corridor of growth. Naturally, this means a heavy concentration of chemical industry, both from the public sector and the private sector.

Take the instance of hazardous waste. According to the Sectoral Environment Report submitted by the Union Ministry of Environment and Forests to the World Bank in August 1997, Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu together comprise 60 per cent of the hazardous waste generated in the country. Gujarat generates as much as 0.50 million tons per annum and no can deny that even this figure is an understatement.

As per the report, the Vadodara District generates the highest percentage of solid waste in Gujarat. The report says "It has been noted that bulk of the generated hazardous waste is not safely handled, treated and disposed, causing a threat of serious contamination of ground water resources, possibilities of health and vegetation impacts due to airborne emission of toxins, the damage to land, depriving its productive use etc." On page number 40 of the report under the heading, Impact on Ecosystems, it is stated: "Disposal of untreated mercury-contaminated effluent from caustic manufacture have contaminated large tracks of land in the Nandesari estate in Gujarat."

Without much concern for environmental norms, Gujarat embarked on a journey to industrialization. Massive chemical estates have been established in Odhav and Vatva near Ahmedabad in the north, Nandesari near Baroda, Ankleshwar, Panoli, Jhagadia, Valia and Vilayat near Bharuch, Pandesara and Sachin near Surat, Sarigam and Vapi estates near Bulsar. Neither was proper environment impact assessment carried out before setting up these estates, nor was it considered important that the industrial centers were established dangerously close to human settlements and cities. Neither are the hazardous solid waste and toxic effluents that are spewed out being monitored properly nor is their disposal given any attention. Whatever little the State agencies like Gujarat Pollution Control Board and the Gujarat Industrial Development Corporation have done all these years - thanks to judicial activism - has proved, at best grossly inadequate, and at worst, a total eyewash.

If proposals mentioned in a document published by the Industries Commissionerate in May 1997 are to be believed, the State is in for a massive investment of Rs.56,000 crore in the chemical industry alone and a substantial chunk of it is likely to be centered between Vadodara and Bharuch. But there is no mention of any investment in social infrastructure, which should be a vital ancillary to such industrial onslaught.

Gujarat has rolled out the red carpet to industrial investment but unfortunately there are no signs of the policy-makers even remotely considering whether the State, and particularly the Vadodara to Bharuch belt, has the wherewithal to absorb so much. It is only ironical that in the Gujarat Government's scheme of things industrial growth has no correlation with quality of life. Philosophically, money here is earned just for the sake of it. In other words, one of the country's most prosperous States is making life difficult for its vast majority even as a select few bathe in the glow of progress, which too is only materialistic and not real. They forget that there is a thin line dividing growth and development.

With the background of this scenario the team visited the 'Golden Corridor'. The following chapters are an account of the IPT investigation into chemical pollution.

Chapter 1
VADODARA - NANDESARI

1. Paryavaran Suraksha Samiti (PSS)
Through its Activist Rohit Prajapati
C/o 101, Shree Krishna Apartment no. 2
Opp. Kothi Police Parade Ground
Raopura, Vadodara – 390 001

2. Nileshbhai Patel
Activist of the Samiti staying
At and Post Dashrath,
Dist: Vadodara 391 740

Petitioners

Vs.

Nandesari Industries Association
For their defaulter members
GIDC, Nandesari,
Dist: Vadodara

2. Vadodara Employers Organisation
For their defaulter members
Federation Building,
R. C. Dutt Road,
Vadodara – 390 005

3. Gujarat Pollution Control Board
Sec. 10/A, Gandhinagar 382 043

4. State of Gujarat,
Through Secretary
Environment and Forest Department
Sachivalaya
Gandhinagar

State of Gujarat,
Through Secretary
Industry Department
Sachivalaya
Gandhinagar.

Respondents

Paryavaran Suraksha Samiti, an organisation working in the field of environment in Vadodara, Bharuch, Surat, and Valsad districts, filed this Petition. The Petition was in respect of industrial pollution in Gujarat Industrial Development Corporation (GIDC), Nandesari and Vadodara Petrochemical complex, both near Vadodara.

The Petition also presents the environmental impact of the 56 Kms. long Effluent Channel Project (ECP) which passes through 24 villages of Vadodara and Bharuch district. The Tribunal has visited and examined issues regarding:

- The GIDC, Nandesari.
- Gujarat State Fertilizer and Chemical Ltd. in the Petrochemical Complex near Vadodara.
- The Effluent Channel Project - a joint venture of Vadodara Petrochemical Complex and Nandesari GIDC to throw their "treated effluent" into the Gulf of Cambay.

1.1 NANDESARI INDUSTRIAL ESTATE

The Nandesari GIDC Industrial Estate was developed in 1968-69 as a general industrial estate and later on converted to a chemical estate without consultation with the villagers around. The Nandesari Industrial Estate (Nandesari) is on 220 hectares of fertile land adjoining the river Mini that joins river Mahi at a distance of 30 kms. According to the Petitioners, the estimated quantity of effluent generation from the estate is minimum of around 2.0 MGD against the water demand of 2.5 MGD. There are approximately 252 industrial units of which more than 20% are manufacturing chemicals, pharmaceuticals, dyes and dye intermediates and plastics. The petitioners have referred to the report of the Modi Committee¹ and have also referred the report of the Gujarat Water Supply & Sewerage Board.

1.1.1 Water Pollution:

Due to the contamination of water, the Gujarat Water Supply & Sewerage Board has proposed the water scheme (popularly known as Fajalpur Juth Yojna) for the 42 villages surrounding the Vadodara Petrochemical Complex and Nandesari. The report² of Gujarat Water Supply & Sewerage Board says: - "... Thus, even though the development of this industrial complex has helped the economic development of Gujarat, it has created adverse impact on the ecology of the surrounding villages. There is noticeable adverse effect on the environment particularly regarding quality of drinking water."

The interim report of the High Court appointed Modi Committee contained a detailed analysis of the 26 most polluting industries that are manufacturing chemicals including H-Acid, Vinyl Sulphone and J-Acid. It is pertinent to note that manufacture of these products is banned in most developed countries. The Modi Committee has reported on 18 of the 26 units; the others were closed when the committee visited the area. Although a primary treatment facility exists for these industries, it is unable to treat the effluents from these heavily polluting industries. Thus 15 of these 18 units manufacturing hazardous substances are not treating the effluent discharged at all. Even the Nandesari Industries Association does not allow this effluent to be treated in their secondary treatment plant and thus this effluent is directly put into the Mini River.

The Modi Committee reported that a Common Effluent Treatment Plant (CETP) has been set up for the other industries in Nandesari. However, 66 industries claim that they cannot send their effluent for treatment to the CETP because the drainage system is broken since 3 years. 160 industries are sending their effluent to the CETP for treatment.

The Tribunal members visited the house of the Ex-Sarpanch of Nandesari Village. The Sarpanch, Mr. Udeshi Ramsinh³ a social worker working amongst the villagers and other residents deposed before the

¹ The Interim Report of the committee appointed by the honourable High Court of Gujarat on the extent of pollution in Nandesari Industrial Estate, Gujarat (Modi Committee Report), 18th June 1995. This Committee was appointed following a special civil application No. 2922 of 1995.

² Fajalpur Rural Regional Water Supply Scheme, Tal. & Dist. Vadodara, by Gujarat Water Supply & Sewerage Board.

³ Personal Interview, Nandesari, 23rd January 1999.

Tribunal. They mentioned that previously the main source of water in Nandesari Industrial Estate was bore wells. One of the Petitioners Rohit Prajapati pointed out that since the bore wells and the entire ground water has become contaminated, the factory owners are now using these contaminated wells to pump down their effluent, thus directly discharging their effluents into the ground water. This fact shocked the Tribunal members who cross-questioned the deponents as to the basis of their statement. They said that the workers of the factories themselves had told them that the bore wells are being used to dispose of effluents.

The villagers⁴ mentioned that the Nandesari Industrial Estate started about 30 years ago, and at that time they had no idea what the impact would be on their soil, water and health. They said that next to the railway crossing, there was a commercial zone in which there were some shops, a bank and a theatre. Four factories Baroda Bitu Chem, Parsonak Chemical, Surat Ammonia and another factory were established. Parsonak Chemical was involved in the manufacture of sulphuric acid. Almost immediately thereafter, the villagers of the surrounding villages started to suffer from severe air and water pollution and from damaged crops. The villagers protested against the air and water pollution caused by the factories and objected that these factories had been established in a commercial and not in an industrial zone. They appealed to Madhavsinh Solanki, the then Chief Minister, to investigate and initiate action against these polluting units. When the Chief Minister visited the site he was shown burnt crops and informed, that on May 11, 1984 the villagers had caught the factory releasing fumes at 2:30 in the night. An expert committee headed by one Dr. Parthasarthy also examined the pollution problem. However, in response to recommendations by the Committee to shift polluting factories more polluting units were set up in the same area.

The Tribunal members visited the farm of Jaswantsinh Parmar⁵ in Sherkhi, which was about 5 kms from Nandesari. Their wells are recharged by the Mini river. According to him the release of the effluent by the Nandesari Industrial Estate and Petrochemical complex into the river Mini caused contamination of their wells. The Tribunal members took a water sample from a well and it was reddish brown in colour.

The petitioners submitted a map of Vadodara, which clearly indicates that the land surrounding this industrial area has gradually degraded due to the contamination of the ground water in the area.

1.1.2 Air Pollution:

The High Court Committee Report states that in reply to their questionnaire many industries admitted to releasing HCl, Nox, Sox, NH₃ and Particulate. Many particulates contain toxic materials like pesticides. Two members of the Committee visited Nandesari at 8 p.m. on 25th May 1995. The members reported that the entire area was “submerged in acid fumes etc. and visibility was so poor that objects at a distance of 10 metres were not visible.” The members also reported that the fumes caused eye irritation, cough and slight breathing trouble.

The members of the Tribunal visited Dashrath, Nandesari and Rampura villages. Bhanubhai Patel⁶ from Dashrath village told us that the villagers were unable to pinpoint the blame on any particular factory. The factory management seemed to follow a pattern for the release of noxious gases. They were usually let out late at night and on public holidays.

Rohit Prajapati of the PSS said that the railway authorities had requested the group to take up the issue of air pollution, since the train driver often could not even see the signals clearly due to the gases.

⁴ Discussion at Nandesari, 23rd January 1999.

⁵ Personal Interview, Sherkhi, 23rd January 1999.

⁶ Personal Interview, Dashrath, January 1999.

1.1.3 Soil:

The Petitioner relied on the report of Vadodara Urban Development Authority⁷ (1984-85) which says: "The project to study the effect of air pollution on crops, economic trees and general vegetation was initiated in beginning of 1984.

It is very clear from the facts and figures of the report that the water used for agriculture is causing lower yields. The decline is to the tune of 30 - 80% for different crops.

The villagers of Nandesari, Rampura, Ranoli, Channi and Dashrath reported before the Tribunal that the crop production has drastically reduced due to the air and water pollution in the area and we were shown some of the farms which are no longer used for agricultural purposes.

1.1.4 Solid Waste:

The petitioner submitted that according to the Sectoral Environment Report⁸ submitted by the Ministry of Environment and Forests to the World Bank in August 1997, the Vadodara district generates the highest percentage of solid waste in Gujarat. The report states, "It has been noted that bulk of the generated hazardous waste is not safely handled, treated and disposed, causing a threat of serious contamination of ground water resources, possibilities of health and vegetation impacts due to airborne emission of toxins, the damage to land, depriving its productive use etc. Disposal of untreated mercury-contaminated effluent from caustic manufacture have contaminated large tracts of land in the Nandesari estate in Gujarat."

In addition, our attention was brought to the Modi Committee report which states that every one of the 26 hazardous chemical industries is dumping the solid wastes in an unscientific, haphazard manner. This practice has definitely resulted in ground water pollution of which the above printed map is an indication. The Tribunal inspected a low-lying area, which was being used as a dumpsite. Waste dumped in this area was neither in containers nor was an impervious lining provided for the 'dumpsite'. Huge quantities of residues of wastes, black and different coloured slurry was lying all around exposed in a haphazard and dangerous manner. One of the petitioners Nilesh Patel told Tribunal members that most of the low-lying areas as well as pits in Nandesari Industrial Estate have been filled up by large amounts of hazardous solid waste. This he said was evident everytime there was excavation for the construction of either roads or buildings.

1.1.5 The Role of the Gujarat Pollution Control Board (GPCB):

The laboratories of the GPCB need to be strengthened with equipment, instruments and safety measures specifically for sampling and analysis.

While presenting the case before the Tribunal Rohit Prajapati pointed out that the data generated by Gujarat Pollution Control Board and State machinery is inadequate and does not reflect the existing ground realities. They do not represent a correct and honest picture of an industrial environment in general. For example to show the water quality of the river Mahi they merely show the reports from Anandpuri, Kadana dam, Virpur, Savalia, & Vasad but they say nothing about the water quality after Vasad. However the Mahi river is heavily polluted after Vasad and this is not indicated in reports brought out by the GPCB. This is true for all the rivers of Gujarat.

⁷ Air Quality Survey & Effects of Pollutants on Human Health and Vegetation, Vadodara Urban Development Authority, Vadodara.

⁸ Sectoral Environment Report, Ministry of Environment and Forest, Government of India, August 1997.

The interaction of the Modi Committee mentions that they had circulated a questionnaire to be filled up by all the industries in Nandesari. Many industries including some manufacturing hazardous chemicals are operating without a valid consent. In some cases, the GPCB had refused renewal of the consent until a secondary treatment facility is provided. Although, the industry failed to provide the treatment facility, the GPCB has not taken any action and the industry continues to operate without a valid consent. In certain cases, GPCB has approved the cheapest and dirtiest manufacturing processes. The Committee has also reported on their interaction with GPCB officials that during a meeting on 19th May, 1995, Mr. V. C. Shah of the GPCB admitted that on a visit to Nandesari, he had noticed that many industries are “directly dumping their effluent in Mini River and that many treatment plants are lying idle”. On further questioning, the GPCB official refused to answer the High Court Committee and the Committee has stated that this situation was “embarrassing” and indicative of the “apathy of GPCB”. It is shocking that the Gujarat State has no comprehensive status report on the pollution situation concerning air sample and soil.

1.1.6 Health:

The main grievance was that for years factories in the Nandesari Industrial Estate have been functioning without any responsibility towards their workmen. Workmen are neither provided with safety equipment and are kept as temporary workers for years together.

Dr. K. K. Shah (Surgeon) and Dr. Maya Valecha (Gynecologist)⁹, both practicing doctors at Vadodara spoke to members of the Tribunal. They said that villages around Vadodara industrial area have a high incidence of allergic skin, nasal and respiratory problems, abnormality of lungs in the form of Emphysema, blood circulatory disorders-high blood pressure observed in young people in the age group of 20s, high incidence of heart diseases, common and frequent Gastroenteritis disease due to polluted water and high incidence of kidney and renal stones. In this area it has been observed that newly weds have problems in conceiving and often many couples have to resort to special treatment. Some of the young males have the problem of impotency. In Dashrath village the Tribunal members met with a family¹⁰ where each member had been affected by kidney stones and were informed that this was not the only family or village to be facing such problems.

The Respondents, Nandesari Industries Association and the government authorities did not respond to the petition. When the Tribunal members visited the Regional Office of the GPCB the officer in charge Mr K.L. Kansagra¹¹ avoided answering any questions, and refused to even give the Tribunal a copy of the Annual Report of the GPCB. In response to any question regarding standards, consents granted to the errant industries, prosecutions against defaulters if any he would merely respond by saying “contact the office in Gandhinagar. The non co-operation was very surprising and was not appreciated by the members of the Tribunal.

1.1.7 Findings of the Nandesari Case

1. The facts placed before the Tribunal tell a very sorry tale regarding the regulatory regime in Nandesari. It is interesting to note that each and every member of the Modi Committee is either a senior government official or senior member of M. S. University of Vadodara and yet they have not minced words in criticizing the GPCB for its total failure to take action against errant industry. In addition the reports brought out by the Vadodara Urban Development Authority (VUDA) and the Gujarat Water Supply and Sewage Board also make a clear mention of the fast deteriorating and already alarming extent of water, soil and air pollution.

⁹ Personal Interview, Vadodara, 22nd January 1999.

¹⁰ Personal Interview, Dashrath, 23rd January 1999.

¹¹ Personal Interview, GPCB office, Vadodara, 22nd January 1999.

2. The situation appears to be one of complete lack of regulation by the GPCB and other statutory authorities. GPCB has failed to take action against errant industries that have either not established effluent treatment facilities or are not using the ones presently available.
3. 66 industries have succeeded in not treating their effluent and releasing it untreated for a period of 3 years on the specious plea that the drain pipe to the effluent plant was broken.
4. In an inconceivable act of criminal irresponsibility, effluent is being released into bore wells, which has also resulted in the entire water table in the area being poisoned. The general housekeeping and the disposal of hazardous wastes is abysmal and totally unregulated. The facts reveal a complete apathy and a total abdication of their responsibility by the GPCB which has failed to enforce even the most elementary regulatory standards in the area, but has permitted industries to operate without consents or in flagrant breach of the conditions of their consent.

1.1.8 Recommendations In The Nandesari Case:

1. A multi party and multi disciplinary investigation team be appointed to go into the issues of air, water, soil, and other pollution by way of noise, heat, dust and radiation, etc. In addition, suggest the method and the kinds of remedial measures. Simultaneously, the industries responsible for pollution should be ordered to finance such remedial measures that may be implemented in consultation with affected workers and villagers and their organisations.
2. The 26 hazardous polluting units should be closed down and ought to be fixed with responsibility to pay workers' legal dues and compensation and also pay for restoration of the environment. They should be compelled to bear these costs particularly in view of the enormous profits earned by the manufacture of hazardous chemicals that are banned in developed countries and elsewhere in India. Criminal prosecution should also be launched against the errant industries and its responsible officials. The world over it is recognized facts that manufacture of H-Acid, G-Acid and Vinyl Sulphone leads to grave environmental damage. The manufacture of these products should be banned as a matter of law and policy.
3. The treatment of effluent should be made compulsory and no direct discharge of untreated effluent into the Mini River or into other water sources should be allowed. All the unused well in the premises of the company must be sealed to avoid its use for effluent discharge.
4. The GPCB should actively monitor the compliance by industries in Nandesari with their obligations under Water Act, Air Act, Environment Protection Act, Solid Waste Handling Rules, Hazardous Chemical Import, Storage and Handling Rules, etc. and take punitive action including, but not limited to suspending operations of errant industries or cutting off their power and water supply. Responsibility should also be imposed on the Nandesari Industries Association to ensure the compliance by each of its members with the pollution control requirements.
5. The maintenance of hazardous waste/toxic inventory should be formulated with utmost urgency and material safety data sheets as required under the Hazardous Waste Management and Regulation Rules and the Hazardous Materials Import Storage and Handling Rules should be scrupulous implemented. Toxic and other wastes should be required to be disposed off in lined proper disposal sites.
6. The industries carrying on hazardous processes must be required to prepare an emergency plan in the event of a toxic incident or other industrial crisis.

7. The GPCB must estimate the carrying capacity of the area and ensure that the level of industrial activity in the region and the disposal of waste do not exceed this capacity. Until all basis study be carried out no new chemical industry should be allowed in the area and no expansion of the any plant of the present industries.
8. A study should be undertaken in the villages surrounding the industrial estate to examine in detail regarding the health situation. This should be followed by short term and long term measures by the government and implemented fully at the cost of polluter industries. The Medical checkup and the maintenance of a medical record of each worker should be made mandatory. Before employing a person to work in an industry, a medical certificate should be taken.

1.2 GUJARAT STATE FERTILIZERS AND CHEMICALS LTD.,VADODARA

The Petitioners have stated in their Petition that rampant industrialization and the setting up of chemical industries in and around the Vadodara area has led to severe industrial pollution and consequent deleterious effects on soil, water, air, the health, standard of living, access to basic amenities and means of livelihood of the community around the industries. The Petitioners have sought to highlight these problems with particular reference to the fertilizer plant of GSFC at Bajwa (Fertilizer Nagar), Vadodara.

1.2.1 Water Pollution:

The main issue raised by the Petitioners in respect of GSFC is regarding the over exploitation of community water resources by the plant and the resulting acute shortage of water in the neighbouring villages. The Petitioners have pointed out that GSFC claims to use 50 lakh litres of water per day for domestic consumption for 1100 families living in their complex. The average use per family would work out to 5000 litres per day, which is a grossly unrealistic figure. According to the Petitioners, this would raise an inference that the plant is in fact using this water for industrial consumption and has sought to mislead the public regarding the water consumed and the industrial effluent released by the plant. The petitioners have submitted that the World Health Organisation recommends that the average water consumption should be 80 litres per day only while the company's figure comes out to be 12.5 times more.

The Petitioners also state that the GSFC receives fresh water supplies from the Mahi Sagar River through the French wells that have deprived the surrounding villages of their principal source of drinking water. The over utilization of water and pollution by the release and seepage of effluent has also resulted into the contamination of water and no recharging of ground water resources. As a result of the acute water shortage, a scheme was required to be framed by the Gujarat Water Supply and Sewerage Board (hereinafter the "Water Board") for supply of water to the affected villages. The Petitioners have relied on the report¹² of Gujarat Water Supply & Sewerage Board says that " To the North-West direction of Vadodara City on the bank of river Mahi & tributary Mini, large industrial complex has been developed after setting up of oil refinery. The industries namely IPCL, Gujarat Refinery, GSFC, GIDC Estate at Nandesari & certain other chemical industries have set up. On one side, the industries started polluting natural sources and on other side the large drawl of water from river Mahi by these industries through tube wells and French wells, system recharging of underground source of the villages under influence of river Mahi deplete gradual which adversely affected to the quantity & quality of water." The report states that the recharging of water sources in villages by the river Mahi was also adversely affected, both in terms of quality and quantity. According to the report,

¹² Fajalpur Rural Regional Water Supply Scheme, Tal. & Dist. Vadodara, by Gujarat Water Supply & Sewerage Board.

28 villages and 14 hamlets have been rendered without any source of water as a result of the over utilization of water resources by various industries while 9 villages and 1 hamlet have been partially affected. The report also states that the available water has very high nitrate content. The report has also noted that "This has resulted into the discontent in the people of the surrounding villages, and it has accentuated on account of the apparent disparity between life and facilities enjoyed by the employees of the industries residing in the colonies of the large industrial complex on the land acquired from the surrounding villages and the deterioration in the condition in which the villages have to live and work. As for the example of water quality only, the resident colonies of industrial complex are getting ample sweet water from river Mahisagar through French well, while the surrounding villages have to depend on the underground water sources, being deteriorated."

The Petitioners have also relied upon a report of 80 water samples taken on 20th and 21st March 1997 from various places in Bajwa, Channi, Dashrath, Karachia, Siswa, Ajod and Padmala.¹³ Although the pH level of the samples is within the acceptable range, the level of total dissolved solids (TDS) is in excess of the permissible limit of 2000 mg per litre for industrial effluent and well in excess of the desirable range of 500 mg. per litre. In fact, 4 of the samples tested by the Petitioners reveal a TDS level in excess of 4000 mg per litre, which is twice the permissible limit. 19 of the samples tested are in excess of the permissible limit and all samples are well over twice the desirable limit. The petitioners have pointed out well near the solid waste site of the company has maximum contamination of water i.e. 12,000 TDS. As distance increases from the hazardous solid waste site the TDS level goes down suggesting clear inverse relation of the effect of the hazardous waste contamination in relation to the distance of the well.

On 23rd January 1999, the villagers of Channi village deposed¹⁴ before the Tribunal that they have to purchase potable water every single day on payment of Rs. 8/ for 20 litres. Mr Pravin bhai Shankarbhai Ptel, Shantilal Becharbhai Patel told¹⁵ us that more than 80% population in the village is not in a position to buy this water and so even today they drink and use contaminated water. The members of the tribunal noticed that a bucket of water drawn from a private tank in the village had at least 3 to 4 inches of white chalky crystalline sediment. The water was also completely turbid. Mr Poonambhai Rajibhai Patel¹⁶ deposed that the water in the tanks, if used for making tea resulted in the milk curdling and that the water cannot be used for cooking. The members of the tribunal were also shown cooking and water storage vessels, which had a white deposit, which according to the villagers had to be removed every 15 days by using diluted acid. It was also noticed that the clothes worn even by persons who were apparently economically well off had holes in the fabric. The villagers also related instances of how at the time of elections, the Chief Minister Keshubhai Patel who visited the village had promised adequate water supply within 24 hours, a promise which remains unfulfilled.

The Tribunal also visited village Bajwa. We went to the panchayat office at Bajwa and spoke at length to the Deputy Sarpanch Mr Sureshbhai Takkar¹⁷ on various issues. He informed us that the village pond is completely contaminated and therefore incapable of being used. He also stated that there is a layer several feet thick of chemicals and other contaminants (probably gypsum and chalk) in the pond. We were informed that on one occasion, three elephants which had drunk the water from the village pond had died. Other villagers also informed the members of the Tribunal that the villagers have to collect water from the water tap provided by GSFC

¹³ Report of the water samples, by Rohit Prajapati & Nilesh Patel, March 1997.

¹⁴ Discussion at Channi village, 23rd January 1999.

¹⁵ Personal interview, Chhani, 23rd January 1999.

¹⁶ Personal interview, Chhani, 23rd January 1999

¹⁷ Personal interview, 23rd January 1999

Mr. Rachhodbhai Chaturbhai Patel¹⁸ told the Tribunal that as the company is in the middle of the villages and has hazardous solid, the villagers also face the problem of contaminated rainwater runoff being deposited in the village pond. He further explained that the company's effluent treatment plant crosses natural rainwater drainage system that runs from Dasrath to Bajwa. During the rainy season this gets flooded and sometimes due to illegal release of the effluent into this system contamination of the downstream ponds and *nalas* occurs.

1.2.2 Dumping of Hazardous Waste:

The Petitioners also raised the issue of dumping of hazardous waste choke and phospho gypsum by GSFC within their premises. According to the Petitioners, GSFC has been dumping choke since long with the result that there is literally a choke hill in the plant premises which is 40 meters high, spread in the area of 14 hectares, lying an open land without any impervious layer at the bottom. The Tribunal inspected¹⁹ the dumping site from outside the compound wall of the GSFC plant. It was noticed that the gypsum dump was almost as tall as a 10-storey building. We were informed that in the years 1997 and 1998, due to heavy rainfall, the gypsum hill slid and the gypsum was washed into and flooded several houses in the vicinity of the plant. We were also informed that Chalk and Gypsum both have heavy metals because they contain waste from all the plants. We were informed that the company has dumped hazardous waste in the area in complete violation of all environmental laws and Hazardous Waste (Management and handling) Rules, 1989. This waste seeps through the land mingles with the ground water, and has led the water becoming totally unpotable in the surrounding villages. It is the demand of the petitioners that as per the Hazardous Waste (Management and Handling) Rules, 1989, the company should either shift the dump to a permitted site or construct an impervious layer at the bottom of the heap to prevent seepage as per the guidelines for management and handling of hazardous wastes, provided by the Ministry of Environment and Forests, Government of India. However, neither of these requests were respected despite legal requirements, the company has been allowed by the Government to do superficial external 'encapsulation', which has already failed once.

The members of the Tribunal were informed that the dumping of gypsum at the said site was going on despite an Order of the Gujarat High Court restraining GSFC from doing so.

1.2.3 Air Pollution:

The Petitioners have also brought to the attention of the Tribunal the serious air pollution in the region. In this regard, the Petitioners have relied on a report of the Vadodara Urban Development Authority²⁰. The Report is in respect of a study conducted by the Authority on the effects of air pollutants on human health and vegetation. The study revealed the extent of damage in terms of percentage yield of several crops in various villages surrounding the GSFC plant as a result of exposure to SO₂. For instance, according to the study, the yield of tobacco in Bajwa has declined by 58%, the yield of potato has declined by 81% and the yield of wheat has declined by 83%. Crops in several other villages have also been adversely affected and there is a drop in yield ranging from 20 % to 83%.

Several affected persons deposed before the Tribunal regarding the problem of air pollution faced in the area. Amar Sivai of Bajwa village said that the ammonia smell is very strong in the early morning and in the evening after 7 P.M. and is worst in winter. It was claimed that as a result, the villagers suffered from eye irritation. The Deputy Sarpanch of Bajwa informed us that very often in the night, there is a loud sound from the factory premises and ammonia gas is released. He also mentioned that

¹⁸ Personal interview, 23rd January 1999

¹⁹ Tribunal member visit, Bajwa, 23rd January 1999

²⁰ Air quality survey & Effects of pollutants on Human health and vegetation, Vadodara Urban Development Authority, Vadodara

this air pollution reduces visibility dramatically. This continues for about 3 or 4 hours at a time. He also mentioned that urea particles and nitrogen oxide pollution is also caused as a result of the industry in the area. Very often complaints are made to the Collector and the Health Commissioner. However, in view of the fact that the incidents occur at night, the said officials do not come themselves, but depute a junior officer. The villagers alleged that GSFC is informed about the complaints made by the villagers and by the time the official arrives an hour or two later, the plant stops the release of gases. They mentioned that a committee headed by Mahinder Singh Chavan was appointed by the State Government in 1992 to study the air pollution problem. However, the study was abandoned after a few months.

1.2.4 Livelihood and Health:

The Petitioners stated that as a result of the unregulated industrial activity in the region, various livelihood and health issues needed to be addressed. In Channi village, the villagers complained about renal stone problems, blood pressure among young persons and a high incidence of infertility. We were informed that in a population of 30,000, there were 30 to 40 hospitals and clinics which are continuously full throughout the year. Some people complained that every few years, some families had to bear expenses upto a lakh of rupees as a result of major health problems or the need for surgery. Mr. Poonabhai Chotabhai Patel has complained that for the last several years no the demand for the fruit from his banana plantation has reduced and his fruit agents explained that his fruits ripen very fast and even perish in transit. He submitted that this is directly result of the chemical pollution.

In Bajwa village, the members of the Tribunal were informed by Dr. Shah that there was a malnutrition problem as heavy metals reduce absorption of nutrients. According to the Deputy Sarpanch of Bajwa, a survey indicated that 44% of the children of the village have stomach and eye disorders. Many five year olds require spectacles of -3 power and 12% children suffer from night blindness. We were also informed that mortality among the young was unusually high in the village.

Bajwa villagers also bitterly complained about land acquisition for GSFC. In 1964, the entire grazing land of the village was acquired for GSFC. The village did not receive a single rupee in compensation. They mentioned that 24 acres of land were acquired beside the railway line in 1984 ostensibly for a green belt. According to the Deputy Sarpanch, GSFC claimed that it had planted 23,000 trees in the said 24 acres, but in fact there are only 16 wild trees on the said land. When this fact was brought to the notice of the deputy collector, Prafullaben Jadeja, she initiated action against GSFC, however she was transferred. We were also informed that agricultural land was bought at 45 paise a square foot and later at Rs. 1.25 per sq. ft. However, this was resold by the government at Rs. 120 per sq. ft. The villagers of Bajwa also bitterly complained that at night the direct road to Baroda was closed by GSFC ostensibly on grounds of security requiring a detour of 12 kms. Despite many complaints to the Collector and a representation by 100 villagers, the problem has not been solved. The Collector has suggested that few vehicles be given passes to use this road.

The Tribunal also visited Dasharath. The villagers of Dasharath mentioned that the entire ground water resources are contaminated. There used to be a big dairy in the village supplying 500 litres of milk a day which had to shut down because of the paucity of water. Joshikaka deposed that private companies have started and closed over the past 20 years and have left almost 5000 persons in the region jobless. For example, Sarabhai Machines has recently thrown out 120 workers. Indian Dyestuff Industries company has issued notices to 345 workmen, 50% of whom are from Ranoli.

GIDC charges a tax from the factories for village development. Ranoli is entitled to at least Rs. 10 to 12 lakhs every year. However, the entire amount is spent in Baroda and till date, Ranoli has received no benefits. The yield of milk has reduced from 5 to 10 litres to 1.5 litres a day.

In Dasharath village, the members of the Tribunal were informed that in early 1960, 15 acres of grazing land was acquired at Rs. 1/- an acre by the Government which was thereafter sold to GSFC at Rs. 7500/- per acre. Progressively, 43 acres of grazing land were acquired. Today, the village has no common grazing land. In the past 36 years, only 17 people from Dasharath have been employed in GSFC of which only 5 persons are from amongst 146 families whose lands were acquired. When GSFC was mooted, the villages claimed that they supported the project because they were promised jobs. The villagers willingly gave up their lands in the hope of jobs and facilities like a hospital. However, neither materialized.

1.2.5 Visit to the GSFC Plant:

The Deputy Sarpanch of Bajwa informed us that for the first time in over 30 years the GSFC has invited elected representatives from the neighbouring villages to lunch. Two members of the Tribunal wished to accompany him to the meeting. Driving through the plant was a surprisingly pleasant experience. The plant was amongst greenery and full of gardens and neat housing colonies, in stark contrast to the white gypsum hill in another portion of the site. The arrangements for lunch were elaborate and when we arrived, panchayat members and others were invited in turn for addressing the meeting. Most of them thanked GSFC for the invitation and appreciated the gesture of opening a dialogue. Most of them complained about pollution and water problems and pleaded with GSFC to help resolve these problems and give jobs to local youth. Some invitees did not mince words and severely criticized GSFC for creating and then ignoring the problems faced by the villagers. The Sarpanch of Bajwa asked the GSFC to give one example of a substantial charity for a medical, educational or community purpose given by GSFC in the neighbouring villages. She demanded to know why despite several requests her village pond which had a layer of chalk and gypsum was not cleaned. The Managing Director said “the meeting is not a platform to say negative things and criticize GSFC”. At this remark several invitees decided to boycott and stage a walk out. They started criticizing other invitees for not being forthright in their complaints. Almost the entire meeting broke up and the Public Relations Officer of GSFC was desperately pleading with the invitees not to leave and insult GSFC. After some coaxing the crowd returned to lunch.

1.2.6 Findings On The GSFC Case:

1. The Respondents despite being requested to attend the Tribunal meeting did not remain present.
2. From an examination of the documents produced by the Petitioners and the personal interviews with the affected persons, it is clear that the industrialisation of the Vadodara region has thrown up severe environmental, social and health problems. GSFC has been a prime culprit in this regard. It is significant that the complaints made by persons in different villages are strikingly similar and raised similar issues.
3. However it is also noteworthy that the villages and towns around GSFC have tolerated untold hardship, environmental damage which has effected their life and health for at least a decade before taking some action. The local community should have taken action against GSFC long ago, however it is not too late.
4. It is evident from the information collected by the Tribunal at Channi that the people in the village have been victims of severe water pollution and water scarcity. The evidence indicates that the

pollution and scarcity problem are a direct result of rampant industrialisation without regard to human health and to available resources. The problem is illustrated by the enormous consumption of water by GSFC alone for industrial and domestic purposes.

5. GSFC's lack of social responsibility is evident from the manner in which they have drawn water from community water sources such as the river Mahi through tube wells and French Wells. The problem has been exacerbated by the failure of the industries including GSFC to check pollution of ground water sources by seepage of effluent and other toxic chemicals. The dumping of gypsum as a means of disposal is a case in point. GSFC has permitted a huge hill of gypsum to build up in its premises without any precautions being observed to prevent leaching and rain water runoff into neighbouring houses and into ground water sources and rivers. This has resulted in a serious pollution problem in the region.
6. The depositions also reveal the unjust manner in which land has been acquired by the State Government for the GSFC plant. Apart from the fact that the government has profited by acquiring land at absurdly low prices and reselling the same at a premium, the government has also targeted for acquisition community land resources that are vital for the village economy such as common grazing lands.
7. The loss of income was a common refrain among the villagers and the industrialization of the area appears to have impoverished rather than enriched the local community. The development and industrialization of the area appears to be totally haphazard and without taking into account the true cost of particular projects. The pollution and water scarcity problems in the area have resulted in the death of agricultural activity in the villages near Vadodara and the value of the productivity lost by the failure to limit and regulate industrial activity in the region has been ignored.
8. The apparent inequity was evident on a visit to the GSFC plant. While a section of the employees of the plant enjoy ample water, tree lined avenues and gardens and lucrative jobs, the community has borne the brunt of industrial activity carried on without effective environmental regulation.
9. The GSFC plant and the complete lack of a regulatory regime is the illustration of a larger truth about industrialization in the area. Government policy in this regard has been short sighted and has failed to take into account the damage inflicted on people and resources by the failure to regulate and impose effective controls. The price of cleaning up the environment in the vicinity of the GSFC plant and the water sources that have been polluted will have to be inevitably paid. At present it is being paid by the community in the neighbouring villages and not the polluter. In the circumstances, the Tribunal has no hesitation to say that the jobs provided by GSFC is no social contribution as compared to the vast scale destruction caused to the community and the environment.
10. The members of the Tribunal who visited the GSFC lunch meeting observed that the elected representatives from the villages could not even speak with one voice in the face of such a tremendous problem. Their opposition and complaints were fractured and haphazardly made, even the protest they launched at the meeting fizzled out in few minutes.

1.2.7 Recommendations In The GSFC Case:

1. The unfortunate fact is that the community around the GSFC plant has tolerated the injustice and pollution for far too long and has failed to take concerted action against the gross pollution and resulting problems. It is therefore necessary that a citizens group approach all possible forums to redress their complaints and to register their potest.

2. Firstly the citizen's action groups should check whether GSFC has obtained all statutory permission and is complying with all the regulations. A detailed examination of all the consents, authorizations, and the annual environmental audits should be made and all the violations should be brought to the attention of courts and authorities.
3. Litigation, awareness through media and continuous lobbying should be the three pronged approach adopted by the action group.
4. An immediate review of the water allocation should be demanded and the action groups should consider legal action to compel the government to review the water allocation.
5. The action group should also take up the health issue and lobby with the authorities that GSFC should sponsor a speciality hospital, where medical treatment is available at a concessional rate.
6. GSFC should also be compelled to pay crop compensation and loss of income compensation.
7. We cannot help but add that even if all the above is achieved it will not be a complete remedy for the suffering of the villages and town around GSFC.
8. There is an urgent need to prepare a detailed Environment Impact Assessment Report of the area with reference to air, water and soil pollution around the GSFC area and health problems in the area to initiate the remedial steps to be taken at the cost of the polluters.
9. The GPCB should ensure that GSFC remove the mounds of hazardous solid waste (chalk and gypsum) lying in the open within a stipulated period to prevent it from causing any further hazard and to refrain from dumping and storing any solid waste near the residential / agricultural areas henceforth.
10. The company should stop using Chalk and Gypsum ponds as leachate from these are also contaminating the ground water.
11. The Effluent Treatment Plant should be relocated as it is in the way of the natural rainwater drainage system of the surrounding villages which is the one of main causes for contamination of Bajwa village pond.
12. It seems that the GSFC has violated the guidelines for management and handling of hazardous wastes of Ministry of Environment and Forests, of Government of India of 1991 and the Hazardous Waste (Management and Handling) Rules, 1989.
13. The Government should see that the GSFC provides portable water to all villagers in the surrounding village immediately.

1.3 EFFLUENT CHANNEL PROJECT (ECP)

1.3.1 Heavy Metal Contamination:

In the early '60s the Vadodara region embarked upon an industrialization journey, and with it came mega industrial projects like Gujarat Refinery, Gujarat State Fertilizer and Chemicals Ltd, Indian Petrol Chemical Ltd., Petrofils, GSFC Polymer's, ONGC, Heavy Water Plant, Gujarat Dyestuff Industry, Indian Dyestuff Industry and ABS Plastics. In response to the large-scale pollution and effluent disposal requirement, the Government of Gujarat appointed a technical committee in 1969 to

investigate the problem of pollution of the Mini River in north Vadodara. After consulting other environmental and engineering institutes it was decided to convey the effluents in a common channel. The Effluent Channel Project (ECP) was commenced in 1983. The channel is a closed masonry conduit, 56 kms long, and passes through agricultural lands in 24 villages in Vadodara and Bharuch districts. We were informed that initially only 13 industries discharged their effluents through the Channel, but now at least 150 industries are members of the ECP. The ECP meets Gulf of Cambay at Sarod village in Bharuch District, at J Point where the effluent is discharged into the estuary.

The broad question to be examined by the Tribunal is whether the ECP has provided a satisfactory solution to the problem of pollution caused by the industries at Vadodara Petrochemical Complex and Nandesari GIDC. The Petitioner's contention is that the ECP has a lots of problems, the primary problem being, spreading the effects of pollution and heavy metal contamination in the food chain throughout the 24 villages, through which the 56 Kms. long Channel passes. These are the villages that are far from the Nandesari GIDC and Petrochemical Complex. The Petitioners have relied on the thesis²¹ by Mr. Avnesh H. Sharma, entitled the "Environment Impact Assessment Along the Effluent Channel From Baroda to Jambusar and At Its Confluence with Mahi Estuary at the Gulf of Cambay with Special Reference to Heavy Metals" (September, 1995) (referred to as "the thesis").

The thesis contains a detailed analysis of the ECP effluent and states as follows:

"The total solids was quite high with the value of nearly 2000 mg. Per liter at J Point and it was hardly 200 gms per liter up stream of J Point. There was an over all increase of 34 % between 1991 and 1993. Correspondingly, both dissolved solids and suspended solids have also registered an increase. This is reflected in the increasing concentration of these parameters up stream. A matter of concern is the dissolved oxygen content at the J Point which in the span of 3 year study period has shown a decrease from a maximum of 7 mg per liter to 6.1 mg per liter in 1993. Correspondingly the COD value has increased by 12 %. Disconcertingly, the COD and BOD values in the upstream areas in turn have increased 100 and 332% respectively."

"Analysis of the metal concentration at J Point over the 3 years span has shown consistent, steady and even alarming increase in all the metals studied, zinc increased by 35%, chromium by 235%, cadmium by 56%, Iron by 182%, mercury by 55%, nickel by 50%, lead by 112%, and copper by 76%."

"While the concentration of chlorides, sulfates and nitrates have shown a steady increase both at up stream and down stream as well as at the J Point... ammonia and total Kjeldahl nitrogen have shown a decreasing trend. A disturbing trend is the increasing concentration of cyanide, oil grease, and phenols in the water at all three points of study over the years."

The thesis also describes the findings of a study of two soil samples, one from an area irrigated by ECP effluent water and the other from an area not irrigated by the ECP effluent water. The findings are:

"The relative concentrations of various of in the irrigated soils samples the total content of the metals was significantly high with copper, chromium, and nickel showing a hundred fold higher content and lead and zinc showing 200 to 250 times higher contents in the top layers of soil. Another observation that could be made from the data is the relatively higher concentration of the metals in those areas where channel water was used solely for irrigation as compared to the areas where there is mixed irrigation with fresh water and channel water. The criteria of irrigation along the channel of either mixed irrigation or irrigation solely by channel water was dependent on accessibility to old village wells and tube wells."

²¹ Environment Impact Assessment Along the Effluent Channel From Baroda to Jambusar and At Its Confluence with Mahi Estuary at the Gulf of Cambay with Special Reference to Heavy Metals, Thesis, by Avnesh H. Sharma, September 1995.

“Some seasonal vegetable grown by the populace along the channel and irrigated with channel water are chili {etc}... The content of the metals in the above, grown along the channel water has been compared with the content in those grown in areas not using channel water for irrigation. Overall the concentration of various metals was high in the vegetables, tobacco and grass growing in the areas irrigated with channel water. Relatively the accumulation of zinc, lead and cadmium was found much higher than that of copper chromium and nickel. Similarly to the vegetable, grains like maize, bajra, wheat and pulse grown along the channel showed significantly higher content of all metals analysed.”

“There are also alarming changes in the contents of total dissolved solid as well as the pH of some of the wells. Two of the wells have also shown above permissible levels of BOD, these changes are nevertheless subtle but definite indications of seepage and forewarn us of the possible seepage of water and undesirable contaminants of the channel effluent into the underground aquifers over the years on consistent use of the channel water for irrigation”

The details of the studies conducted, particularly the findings of heavy metal contamination in the grain, vegetables and other plants along the ECP are given below.

1. Grain

	<u>METAL</u>		<u>MAIZE</u>	<u>WHEAT</u>	<u>BAJARA</u>	<u>TUVER DAL</u>
1.	Cu	C	1,90	76,30	136,20	1,10
		P	16,30	89,80	204,00	2,60
		I	757,80	17,70	49,80	127,70
2.	Cr.	C	1,10	1,10	2,00	1,30
		P	3,90	3,40	63,20	8,20
		I	245,50	201,00	3060,00	556,80
3.	Zn	C	108,70	99,40	262,80	9,90
		P	318,10	367,40	427,40	38,20
		I	195,20	269,90	62,60	285,00
4.	Ni	C	2,10	1,00	1,10	1,30
		P	63,40	2,10	3,20	61,50
		I	2914,20	108,30	191,00	4820,00
5.	Pb	C	1,30	1,10	1,30	1,20
		P	3,30	2,40	2,30	4,20
		I	153,80	109,30	123,00	267,00
6.	Cd	C	2,10	2,40	2,20	5,70
		P	8,90	21,30	10,70	10,30
		I	323,80	787,50	386,00	80,70
7.	Fe	C	8,20	6,70	2,80	4,80
		P	21,70	41,30	25,70	28,60
		I	164,60	516,40	817,80	495,80
8.	Cal	C	3520,00	5111,00	3876,00	6212,00
		P	7110,00	6017,00	5232,00	6983,00
		I	101,00	17,70	35,00	12,40

2. (a) Vegetables

	METAL	TOMATO	CABBAG E	GREEN PEAS	BITTER GOURD	GEELODA	
1.	C	Cu	1,40	1,70	1,90	2,00	3,00
	P		11,80	20,70	15,00	17,00	13,00
	I		739,30	1147,00	702,10	750,00	333,30
2.	C	Cr.	1,20	1,20	1,10	4,00	5,00
	P		7,60	8,30	7,10	21,00	17,00
	I		535,40	615,30	578,60	425,00	240,00
3.	C	Zn	2,20	11,20	6,40	5,00	4,00
	P		10,80	42,60	33,90	21,30	14,20
	I		390,90	281,90	431,40	326,00	272,50
4.	C	Ni	1,20	1,50	1,10	3,00	4,00
	P		2,30	2,50	2,10	10,30	21,30
	I		89,20	63,30	97,90	240,00	432,50
5.	C	Pb	5,20	1,60	1,40	4,00	4,00
	P		91,30	66,30	8,60	21,10	3,10
	I		1665,80	4045,60	529,50	427,50	677,50
6.	C	Cd	1,40	1,90	1,90	3,00	2,00
	P		6,20	7,50	4,70	9,00	10,10
	I		344,30	305,40	148,00	200,00	405,00
7.	C	Fe	8,20	6,00	14,00	10,30	4,00
	P		31,20	21,70	24,10	41,30	13,30
	I		280,50	261,70	72,10	301,60	232,50

3. (b) Vegetables

	<u>METAL</u>	<u>CHILL</u>	<u>DRUMSTICK</u>	<u>CAULIFLOWER</u>	<u>BRINJAL</u>	<u>POTATO</u>	
1.	C	Cu	1,30	2,30	2,40	5,20	2,00
	P		6,00	39,00	33,00	29,00	9,20
	I		351,10	1573,00	417,00	457,60	364,20
2.	C	Cr.	1,20	1,30	2,00	1,20	1,20
	P		11,30	3,10	3,30	2,00	1,60
	I		837,50	135,30	66,40	68,80	33,30
3.	C	Zn	6,60	1,30	7,80	3,60	7,50
	P		31,90	86,80	20,30	48,10	22,60
	I		382,90	6422,50	160,30	1236,80	201,60
4.	C	Ni	1,00	1,20	1,40	8,70	1,30
	P		2,90	2,20	2,20	18,80	2,30
	I		190,00	81,30	54,30	115,50	82,00
5.	C	Pb	2,10	1,60	2,30	2,80	1,30
	P		6,80	9,20	6,80	26,30	9,80
	I		217,70	475,00	195,00	837,50	684,00
6.	C	Cd	5,11	1,90	2,20	2,20	1,20
	P		22,60	7,90	4,90	8,80	8,80
	I		312,60	314,20	122,00	298,90	629,20
7.	C	Fe	3,00	4,00	8,00	12,00	3,20
	P		9,00	12,00	18,20	32,10	10,10
	I		200,00	200,00	127,50	167,50	215,60

5. Other Plants

		METAL	TOBACCO	GRASS
1.	C	Cu	2,30	1,20
	P		11,80	3,40
	I		13,50	198,00
2.	C	Cr.	1,10	1,10
	P		2,10	2,10
	I		91,60	91,60
3.	C	Zn	1,80	1,80
	P		108,60	108,60
	I		6107,10	6107,10
4.	C	Ni	1,50	1,50
	P		3,90	3,90
	I		156,90	156,90
5.	C	Pb	8,20	8,20
	P		46,80	46,80
	I		471,00	471,00
6.	C	Cd	1,60	1,60
	P		3,00	3,00
	I		81,90	81,90
7.	C	Fe	2,90	2,90
	P		21,20	21,20
	I		631,00	631,00

C - CONTROL SAMPLE VALUE [NON-CHANNEL IRRIGATION]

P - POLLUTED SAMPLE [CHANNEL IRRIGATION]

I - PERCENTAGE OF RISE IN HEAVY METAL.

Values are in mg/kg

In response to the press reports about the Tribunal's visit the Chief Executive of the ECP has sent a reply²² in the matter. However despite service of the Petition upon the office of ECP their reply is confined to certain press reports and not the petition. He has stated that the GCPB, CPCB and the ECP, which has a well-equipped laboratory, monitor the effluent quality. He stated that all the standard values of the metal in the channel are "well below the standards". He therefore concludes that heavy metal contamination cannot be attributed to the ECP effluent. He quoted the Retired Dean of Faculty of Science of M. S. University of Baroda, as saying that "the ECP is safe enough to be mixed with sea water and does not harm aquatic life". He also stated that there was no case of oozing or seepage of ECP effluent into the wells. He stated that there were elaborate arrangements for proper dispersion of the out fall of the ECP and elaborate arrangements "gun men, guards, notices and hoarding not to use the ECP effluent for agriculture". However, he states "some farmers may be using channel effluent not only because they may not have a source of fresh water supply but because of the temptation to use the channel water which is free of cost and is not found to damage the crops."

In the reply submitted by the Chief Executive of the ECP he has stated that no reliance should be placed on Mr. Avnesh Sharma's thesis. He dismissed the finding as "arbitrary, baseless and erroneous" and the thesis saying it is "an arbitrary, ad-hoc study by a college student without any authentication by the authorities should not be relied upon lest it might create a panic amongst the local population"

²² Reply sent by Mr. Arvind Bhatt, Chief Executive Effluent Channel Project, 30th January, 1999.

1.3.2 PRELIMINARY FINDINGS ON THE ECP CASE:

These findings are on the facts and submissions in the ECP case stated above, the Tribunal has dealt with the depositions made in this case separately for the sake of convenience.

- 1) The Tribunal did not have an opportunity to independently examine or verify the case of heavy metal contamination, as heavy metal contamination is not apparent. However, the statements made by the Chief Executive of the Effluent Channel Project in support of his contention that there is no pollution and contamination is doubtful in our view. On the one hand the said official states that the channel effluent cannot cause contamination as its contents are within limits. On the other hand, the same official spoke of elaborate arrangements including gunmen, security and hoarding to prevent the villagers from using the effluent. It is therefore not clear whether the ECP's case is that the effluent cannot contaminate vegetation or whether the ECP is arguing that the contamination has resulted due to the use of effluent which according to the ECP is strictly prohibited. In the first instance the Tribunal will like to observe that Mr. Avnesh Sharma's thesis on the face of it is a well documented scientific study and there is no reason not to rely on the same. He has painstakingly explained the method of experiments conducted and has systematically recorded in detail the results. It is therefore our opinion that the thesis cannot be dismissed as being an arbitrary study done by a student. The Chief Executive in his reply has merely stated that there are several records to show that the metal contamination is within permissible limits but he has completely failed to substantiate his case and has offered no proof, study or experiment or even cursorily mentioned one in support of his claim. Therefore the case that the effluent is not contaminating at all is far fetched.
- 2) The Tribunal members would also like to state that they traveled along almost 30 kms. of the channel and did not notice one single security person or hoarding warnings against the use of the water. The Tribunal members definitely did not see any gunmen guarding the channel. As regards the ECP official's contention that the villagers are using the effluent despite warning not to use the same, it is clear that the villagers and farmers along the channel are using this water not as a matter of choice but because they have no choice in the matter. This finding has been discussed at length later in this report. Before examining the deposition and interaction between the Tribunal members, and the villagers and the officials of the ECP it would enough to state that the Tribunal is convinced that the thesis has proved that there is a very serious case of heavy metal contamination.

1.3.3 FURTHER SUBMISSIONS ON THE ECP CASE:

1.3.3.1 Water Pollution:

The Tribunal members visited²³ the last 30 kms of the ECP. There were many farms adjoining the channel, the entire length of the channel was dotted with motor pumps. There are also some small factories, most of them did not even have names or boards. At one point we noticed the effluent outflow from the factory was emptying into the channel. At Chokaari village²⁴ we saw a polluted well in a farm adjoining the channel. We spoke to some farmers²⁵ along the channel and questioned them whether they were aware whether they should not use the water from the channel, some farmers said they were aware that the water was not good and was industrial effluent. They said the colour and smell itself indicated that this was not water but industrial effluent. However, they were quick to add that they used the ECP effluent, as they had no other option. They stated that their original sources of water had been contaminated and thus whether they used the well water or the ECP effluent for irrigation it amounted to the same thing. They mentioned that they walked 1 to 4 kms. for drinking water. Some farmers were hesitant to admit that their crops were adversely affected. On some cross questioning one or two persons admitted that the grain grown by them was spoilt after a few months and that the flour made from the grain would turn bitter in only a couple of months. The members

²³ Along the ECP, 22nd January 1999.

²⁴ Tribunal Members ECP visit, 22nd January 1999.

²⁵ Personal Interview, Ganesh Jaising and Pushpaben, Chokaari Village, 22nd January 1999.

suspected that the farmers were not very forthcoming as they were not sure of the identity of the members of the Tribunal and were wondering whether admitting that their crops were affected would affect their marketability.

There were small subsidiary channels to the main channel that was also full of effluent. The Tribunal was informed that these subsidiary channels were there to check any excess flow. However, it was noticed that although the channel was not full these subsidiary channels were full. On inquiry unauthorized users of the ECP informed us that these channels are used to discharge effluent.

1.3.3.2 Safety, Health and Livelihood

The entire channel is covered with cement blocks, however almost every 20 to 30 meters some of these blocks were missing. The farmers complained²⁶ that this leads to accidents and children and cattle fall into the channel. When asked why the blocks were removed the farmers and villagers said that the ECP staff removed the cover for cleaning purposes. The ECP officials blamed the villagers for removing the blocks to access the effluent. One incident of a child being dragged for several meters in the channel was also related to us.

Some farmers and villagers deposed that they had skin trouble. When they ate their own crops they noticed that they felt excessive thirst and sometimes a soreness or irritation. The Petitioners stated that they had carried out tests on cut hair from a local barber's shop, the sample showed the hair contained metals.

Some portions of the crops along the channel looked pale and even burnt. Some farmers said that using the effluent they could now harvest two crops, while earlier the wells did not have adequate water for a second crop, although they were not sure whether two contaminated crops were better than one good one.

Towards the last few kilometers the Tribunal members noticed that the channel was only a foot or two above the ground level. We were also shown a case of out flow from the channel in a low-lying area along the road. We were informed that over flows often resulted in the effluents spreading in the adjoining fields. However, this allegation was refuted by the officers of the ECP, they claimed that the channel when lower was deeper to create a gradient for flow. On being asked how effluent had flowed out the official sought to attribute it to a damaged wall of the canal which was since repaired.

One of the Tribunal members met with some villagers near J Point. They informed her that before the ECP at least 600 families used to fish along this coastline but now they do not get a good catch of fish until about 10km. into the sea

1.3.3.3 Submissions made by the ECP officers:

At J Point the Tribunal members had a meeting with the Project Manager, Scientific Officer, Deputy Executive Engineer, Additional Assistant Engineer and Lab Assistant. J Point is the discharge point where a huge pipe lets out the effluent on the shore where the waves break. On inquiry the officers informed us that ECP is an independent company which is financed by members which include the big industries and other smaller industries who are allowed to discharge their effluents in the ECP. On being questioned on pollution and contamination they stated that it was entirely the fault of the farmers who were using the effluent when asked not to do so. At the same time the officers stated that even if the farmers were using the effluent it was not possible that the same was causing pollution and

²⁶ Personal Interview, Chokaari Village, 22nd January 1999.

contamination as alleged. The Tribunal members then suggested that the officer's statements suggested that there would be no harm done if the farmers used the effluent, to which the officers contradicted themselves and gave evasive answers.

On being asked whether the out pouring of effluent on the high tide line was a violation of the Coastal Regulation Zone Notification the officers said they did not know what the CRZ Notification required or whether they were in violation of the terms of the Notification.

The ECP officers mentioned that the effluent tests indicated that all substances and parameters were within permissible limits. However they stated that these test results were not available to the public. The officers were questioned as to how they maintained the quality of effluent and what action they took against members whose effluent contained impermissible levels of contaminants. They said that the members were required to treat the effluent before sending it into the channel and if they found a member violating this condition they would send a fax to the industry asking them to rectify their discharge.

Elaborating on the membership of the ECP the officers stated that industries are given membership on the payment of required fees.

1.3.4 FURTHER FINDINGS ON THE ECP CASE:

- 1) After the site visit and on hearing the various submissions the first impression of the members of the Tribunal is that the ECP is an ill-conceived project which is self-defeating. If the idea of the ECP is to transport highly polluted effluent into the sea so as to minimize its deleterious effect in the villages around the ECP, then this objective has not been fully served. In fact the case of heavy metal contamination in the soils and vegetation around the channel only goes to show that in fact the ECP has managed to spread the contamination and pollution over vast stretches of land.
- 2) It is a matter of grave concern that industries manufacturing various products and discharging various pollutants are allowed to discharge their effluents in a common channel. It is not at all clear whether tests are done to ascertain if the various effluents will react with each other, or what is the effect of this cocktail of effluents
- 3) The fact is that ECP is an independent company discharging the effluent for manufacturing units. The ECP is obviously an entity with limited funds and income, and is therefore likely to be used as an escape route for liability arising out of an accident or contamination. It is therefore important to ensure that the company discharging the effluent is jointly liable for any damage/accident.
- 4) The multiple membership of the ECP is also likely to complicate the question as to who is responsible and liable in case of an accident or contamination. In the present case 150 industries are discharging into the channel, some unauthorized users are also using the channel, in this situation it will be almost impossible to fix responsibility and liability.
- 5) On examining the competing claims of the farmers and the ECP officials, the Tribunal members observed that irrespective of the fact that the ECP officials did not prove their statement that they have made elaborate security and other arrangements to ensure that the farmers do not use the effluent, it is obvious that the farmers have reason to believe they should not be using the effluent for irrigation. At least in one hamlet we have observed that the sources of water have been polluted and contaminated thus compelling the use of the effluent. At this juncture it is important to state that irrigation using the effluent has no doubt caused pollution and contamination, but it is also important to state here that the experiment in Mr. Avnesh Sharma's thesis on columns of soil concludes that there is contamination by seepage and oozing of effluent out of the channel.

- 6) Members of the Tribunal noticed a crane walking along the edge of the pool where the effluent was mixing with the estuarine waters. The crane seemed to be getting an easy catch of fish along the line where the effluent was mixing with the estuarine waters. It would be reasonable to suppose that the fish that came near the effluent or the fish in the mixing area were slower or dying. The ECP's reliance on a statement of the Dean of the Science faculty that the effluent mixing with seawater does not harm aquatic life appears to be belied by this incident.

1.3.5 RECOMMENDATIONS ON THE ECP CASE:

- 1 The Tribunal is of the view that the design and concept of the ECP is flawed and it is therefore important that the proposal to construct an underground closed pipeline to carry the effluents should be considered. This disposal method is less intrusive, and decreases the risk of farmers using the effluent for irrigation purposes and unauthorized use of the channel. The land acquired for the channel can be returned as an underground pipeline will require ECP only to have temporary right of way until the entire pipeline is laid. Once the pipe line work is done the ECP will have only access rights for maintenance purposes.
- 2 Tests should be carried out on the food products that are being grown along the channel and if found harmful for human consumption they should not be allowed to be sold in the market. Although this will cause a loss to the farmer, it is in public interest to arrest the sale of foods containing heavy metals. At the same time steps should be taken to provide alternative irrigation facilities to the farmers.
- 3 It is also necessary to simultaneously start investigations and studies to fix liability and responsibility for the cause of heavy metal contamination.

Chapter 2 VALSAD - VAPI

Paryavaran Suraksha Samiti
Through Michael Mazgaonkar
At Kantidara, P.O. Pipadhara
Via, Rajparadi
Dist: Bharuch – 392 115

Petitioner

Vs.

Gujarat Pollution Control Board
Shed no. C-1B-5501/2, Shed no. 4
GIDC Estate
Vapi – 396 195

2) Gujarat Industrial Development Corporation
GIDC Administrative Building
GIDC Estate
Vapi – 396 195

The Collector
Valsad

Respondents

Paryavaran Suraksha Samiti (PSS), the petitioner, is a network of activists working in Bharuch, Baroda, Surat and Valsad districts. The PSS has been concerned about the impacts of various projects on the lives of common citizens and poor people engaged in primary productive activities and the environment.

Respondent No.2 Gujarat Pollution Control Board is the state authority in charge of monitoring and controlling pollution in the area. Respondent No.2 is the Gujarat Industrial Development Corporation (GIDC) in charge of planned industrial development in various parts of Gujarat. Respondent No.3 is the Collector, who is the administrative head of the district.

Background

Valsad is the southernmost district of Gujarat. Blessed with a good rainfall (around 2000 mm annually), the region has traditionally been the fruit basket of Gujarat. Besides the Valsadi teak and the rice paddies, Valsad was and continues to remain a significant producer of mangoes, guavas, chikoos and coconuts.

Irrigated agriculture has a long history in this region. And, of late, many of the farmers have converted to cash crops such as sugarcane.

Given its proximity to the Arabian Sea and the fact that five perennial rivers empty into the sea within the region, Valsad has also been home to tens of thousands of people who are dependent on marine and riparian resources for a living. Most significant among them are the fisherfolk estuarine, riparian and marine.

However, the industrial boom in the late 1960s has transformed the region from an area of pristine beauty and self-sufficient communities to an industrial wasteland. The Vapi Industrial Estate was set up in 1967 to absorb the industrial investment from neighbouring Mumbai. Today, this estate has more than 1,950 industries in 1,117 hectares of land¹.

Vapi in Valsad district has around 1800 factories, of which roughly 450 are categorised as polluting industries -- 50 paper mills, 60 dye intermediate producing units, 200 dye industries, 100 pharmaceutical factories, 25 textile dyeing units and 10 pesticide plants. In the absence of any infrastructure to safely and adequately contain and dispose the wastes generated in the estate, factories have made it common practice to discharge their toxic effluents into rivers, creeks, streams and open land, and dump their hazardous solid wastes on public land or within the estate.

In fact, the Vapi Industrial Association has allowed its members to dump waste on a 0.6 ha plot within the estate².

These practices have seriously compromised the quality of life of communities in the district, and have damaged the life-support systems the water, the land and the air.

2.1 Development and Livelihood:

Despite the existence of thriving agriculture-based and fisheries-based economies in Valsad, development in the district over the last four decades has meant the setting up of chemical and allied industries. Unfortunately, this has come at the cost of the self-sufficient farmers, horticulturalists and fishers.

Apart from the pollution load placed by the industries on the environment, the sheer magnitude of water used by the industries has robbed other water users of their fundamental right to clean water. According to the Central Pollution Control Board, Valsad district has at least 17 medium- and large-scale paper and pulp mills. These are highly water-intensive and consume as much as 250-450 cubic metres of water per tonne of pulp³ and all of them discharge into the nearby rivers Kolak, Damanganga or Par⁴.

That the industrial model of development in Vapi has ignored local priorities is evident from statements made by local villagers that the state has virtually handed over common resources such as water to industries. Sumanbhai Desai, a fruit grower from Valsad, explains: "the River Par was dammed in the 1950s to provide water for Atul Complex (a large manufacturer of hazardous chemicals). The river is diverted, used by Atul and the effluent released for consumption by the public. The Pariyari Khadi has been dammed by Rohit Pulp & Papers. Part of the water from Damanganga river is diverted to augment the water supply to Vapi GIDC"⁵.

The people living around the Atul complex and those living around Vapi and Sarigam estate have reported a significant loss in both horticulture and farming. According to Sumanbhai Desai, a fruit grower from Valsad, yields have halved since the industries began operations⁶.

¹ Vapi Audyogik Vasahat, EK Najare, GIDC, 1998

² Shankar V., Martin M., Bhatt A. and Erkman S. Who cares where it is dumped? Down to Earth, June 1994

³ TERI, Environmental Considerations and Options in managing Indias Long Tem Energy Strategy, 1996.

⁴ Pollution Assessment, Monitoring & Survey Division, CPCB, Inventory of Large and Medium Water Polluting Industries Volume II (Gujarat) january 1994

⁵ Intervention by Sumanbhai Desai at meeting with Collector, Valsad 23.1.1999, Circuit House, Valsad

⁶ Personal Interview with Sumanbhai Desai and others.

Notwithstanding the damage done to fisheries due to the chemical effluents from the industries in Valsad, the district remains a significant player in fisheries. The 29 fishing centres in the district supplied more than 58,000 tonnes of fish in 1994-95. Fisheries department statistics place the number of fishers at around 25,000⁷.

Kolak, a village on the banks of the River Kolak, sits at the confluence of the river with the Arabian Sea. According to the villagers, the river receives untreated and partially treated effluents from several hundred companies of the Vapi Industrial Estate. "Usually, the river is extremely polluted and red in colour. But the factory owners must have heard that a team is visiting; so they shut their discharge. The water has looked clean these last three days", says Haribhai Tandel, ex-Sarpanch of Kolak village⁸.

The discharge of untreated effluents by the industry into Kolak river is borne out by statements made by a knowledgeable local journalist. The (Vapi) estate receives 18 million gallons per day (mgd) of water, but the CETP which went on stream in 1997 has a capacity of only 5.5 mgd. Most of the effluent is released without treatment and flows through the North storm water drains and water courses and enters the Kolak⁹.

Villagers complain that the effluents have virtually decimated the fish stocks in the river and estuary. Mass fish kills are a frequent phenomenon along the coast. In mid-1998, nearly 150 tonnes of dead fish was washed ashore near Udvada.

"The sea and river used to abound with boi, katla, bombil (Bombay Duck), pomfret and levta (mudskipper). Even as recently as five years ago, we found enough fish in the river to feed the family. Now there is no fish in the river. You can't catch enough for the family even if you fish the whole day, so nobody wastes time with the river anymore", Haribhai explains¹⁰.

Reports from several villagers indicate that at least one fish, the levta (mudskipper) is commercially extinct in the estuaries of Valsad. Its extinction has severely disrupted the way of life of the Mitna Machhi and Mangela Machhi communities who made a living by trapping levta and other estuarine fish. "Previously, my husband used to fish in the creek and would catch enough for the family and for sale. Now we barely catch enough to eat and are often forced to eat plants", says Maku, a Mitna woman from Warkhurd village¹¹. Another Mitna woman explains that due to decline in fishing, people are now going to Bharuch to work in salt pans¹².

The effects of the effluents are not restricted to the rivers. Rather, because the rivers empty into the Arabian Sea, even the coastal fisheries have suffered. Jagdishbhai Vallabh Tandel, from village Kolak¹³ told the IPT members, "the Tandels, who are marine fishers, used to fish close to shore. Now, they are forced to go beyond 10 kilometres. The Kolak and Damanganga rivers are big, so they push the pollution up to 10 kilometres. The poorer fisherfolk, who do not have motorised boats are forced to fish closer to shore. The locals are scared to buy this fish, and unsold fish is often buried. Some of the smaller fishermen who are unable to catch fish near the shore are forced to work as labourers on trawlers for Rs. 40 per day. The women work in the factories for Rs. 30 per day."

⁷ Ayojan Naksha Pothi, Valsad, 1996, Govt. of Gujarat

⁸ Interview with Haribhai Tandel, Ex-Sarpanch, Kolak Village, 23.1.1999

⁹ Comments made by reporter from Sandesh, Valsad 23.1.1999

¹⁰ Interview with Haribhai Tandel, Ex-Sarpanch, Kolak Village, 23.1.1999

¹¹ Interview with Maku, Mitna woman from Warkhurd village 23.1.1999

¹² Interview with Gomti Bakariya and Chiya Mangal, members of Mitna Machhi tribe of Warkhurd village. 23.1.1999

¹³ Interview with Jagdish V Tandel, Kolak village 23.1.1999

The claims of the villagers are consistent with evolving scientific evidence that pollutants of the kind that are known to be released from Vapi's factories can have long-term population level effects on fisheries. Take pulp mill effluents, for instance, Burnison et al report that pulp mill effluents comprise a myriad chemicals that have the potential to cause deleterious effects on aquatic biota in receiving waters¹⁴.

Further, analyses by Greenpeace have revealed the presence of several persistent organic pollutants in the waste streams from Vapi's industries. Although, dioxins were not specifically identified, it is well known that bleached pulp mills (of which there are several in Vapi) are a key point source for dioxins and related compounds to marine and estuarine sediments¹⁵. Also, several studies link dioxin body burdens to decreased male sex hormones in fish; some reports found that fish exposed to bleached pulp effluents have smaller gonads than fish in control sites¹⁶.

Residents of Kolak¹⁷ and Warkhurd¹⁸ villages say that the effluents have also contaminated their groundwater, rendering some sources unusable. According to Kolak fisherman Jagdishbhai Vallabh Tandel, the villagers are drinking contaminated water in the absence of an alternative. The well near the temple in the village, which used to supply water to the village, is now closed because it is too contaminated.

The situation in Daman, a union territory on the banks of Damanganga river, is no different. In both Daman and Kolak, villagers reported that fisherfolk are giving up their livelihoods and migrating to other jobs as labourers on merchant ships or in nearby areas.

Some reports indicate that the pollution has affected even the lifestyle and recreation of the nearby communities. "Our villages had brilliant swimmers. Swimming was a regular event during our festivals, such as the Harrify and Utsav Rakshabandhan. All these celebrations are now closed, and our children no longer swim as well as we did when we were kids", explains Premabhai Tandel, secretary of BJP from Daman & Diu¹⁹. "We used to get dolphins here in the river. Now we only see them 4-5 kilometres away".

Although unquantified, there is little doubt that the pollution-intensive development model adopted in Vapi has actually led to an overall decline in productivity of the region. A 1996 study by the World Bank found that, even with very conservative estimates, the annual losses due to pollution and other forms of environmental degradation were the same as the annual rate of growth of GDP for India²⁰. In effect, losses due to environmental degradation are nullifying the annual economic growth for India.

2.2 Health

Given the widespread and abundantly evident pollution of the air, water and land in Vapi, (see section on Water and Air) it is not surprising that local doctors and residents approached the members of the

¹⁴ Burnison BK, PV Hodson, DJ Nuttley and S Efler. A bleached-kraft mill effluent fraction causing induction of a fish mixed-function oxygenase enzyme. *Environmental Toxicology and Chemistry*, 15(9): 1524-1531

¹⁵ Santillo D., Stephenson A., Labounskaia I. And Siddorn J. A preliminary survey of waste management practices in the chemical industrial sector in India: Consequences for environmental quality and human health. GRL Technical note 96/8, Greenpeace Research Laboratories, UK, 1996, pg.21

¹⁶ Cited in D. Santillo op cit. Page 20

¹⁷ Presentation by Jagdish Vallabh tandel, Kolak Village, 23.1.1999.

¹⁸ Interview with Gomti Bakariya and Chiya Mangal, members of Mitna Machhi tribe of Warkhurd village. 23.1.1999.

¹⁹ Interview with Premabhai R Tandel, BJP Secretary, Daman Diu, 23.1.1999 at 12.30pm.

²⁰ The cost of inaction: Valuing the Economy-Wide Cost of Environmental Degradation in India, The World Bank, 1996.

Indian People's Tribunal with complaints of various kinds of ailments. However, it is disturbing to note the absence of any kind of systematic data on the health effects either by the Government or the industry.

In a candid statement, the resident district collector of Valsad admitted the Government's inability to regulate, or even monitor, the environmental health conditions in Valsad.

Among the reports received by the Tribunal team, a few ailments surfaced repeatedly:

- Cancers (various kinds)
- Skin diseases, including chemical eczema
- Paralysis
- Respiratory disorders, including chemical asthma, general breathlessness.

Dr. Percy Kharas, president of Indian Medical Associations Valsad chapter, provides even more damning evidence gathered from his experience: The contaminated water and toxic wastes are adversely affecting the health of residents in Vapi. The industrial estate has no system of disposal of effluents. Most of the drinking water sources are contaminated. The Class III and Class IV workers are malnourished and therefore more sensitive to occupational health hazards such as chemical asthma. Chemical dermatitis is on the rise in Vapi and so is carcinoma. There is an increase in skin, lung and throat cancer. Women from Maghod Dongri and those residing behind Atul Complex exhibit a higher incidence of spontaneous abortion, bleeding during pregnancy, abnormal foetuses. Infertility is also a frequent complaint. Children suffer from respiratory and skin problems and retarded growth.

Some of the more serious instances of pollution-related health effects have gained mention in World Bank documents. One report states that indiscriminate dumping of hazardous wastes, including chemicals containing high levels of mercury in Vapi reportedly caused health problems. Cases of people receiving burns on the feet while walking near the dumpsites were registered at the local hospital at Vapi²¹.

As revealed in previous sections, air and water pollutants in Vapi include a deadly chemical cocktail containing heavy metals, persistent organic pollutants such as polychlorinated biphenyls (PCBs), other organic contaminants including dichlorophenols, chlorobenzenes and chemicals that are indicative of the presence of the most potent poisons -- dioxins and furans.

Samples of sludge waste taken by Greenpeace from the Vapi Industrial Estate revealed chlorinated compounds including chlorobenzenes, chlorinated terphenyls, hexachlorocyclohexanes, and high levels of mono-, di- and trichlorobiphenyls (PCBs).

These are a class of highly toxic, persistent (do not degrade easily) and bio-accumulative chemicals, slated for world-wide phaseout by the United Nations Environment Program as per an agreement contained in Agenda 21 of the Rio Earth Summit to which India is signatory.

A number of sub-lethal effects have been linked to exposure of animals and human populations to high levels of PCBs and related chemicals, including effects on sexual development, altered thyroid activity and related changes in brain chemistry and function, suppression of immune system and impaired bone development.

Foetal exposure to PCBs has been linked to behavioural changes and mild learning difficulties in children. Many of these effects may result from interference with the endocrine (hormone) system,

²¹ Case studies showing impacts on public health, cited in MoEF, India Hazardous Waste Management Project. Sectoral Environmental Assessment Report. Submitted to the World Bank, August 1997.

which plays a central role in development and regulation of a wide range of body functions. The hormone mimicking action of PCBs can exert effects even at exceedingly low doses of exposure because hormones are effective in the body at very low concentrations.

Exposure of the developing foetus in utero to elevated levels of PCBs, and to other man-made chemicals, as a result of transfer from maternal blood, may be of greatest concern, since the foetus is generally more susceptible than later life stages²².

Many of the chemicals that fall under the category of Persistent Organic Pollutants, including hexachlorocyclohexanes, dioxins and furans exert similar effects.

Another analysis by Greenpeace of the combined effluent from Vapi discharging into Daman Ganga river, revealed high levels of toxic metals including lead and mercury.

Lead can poison the central human nervous system, and is a lung and kidney carcinogen. Its effects on brain and behavioural development are particularly evident among young children. Mercury compounds, too, can severely impair the central nervous system, and is a deadly poison²³.

Di- and tri-chlorinated phenols, which were found in the pulp mill effluent in nearby Surat district, also have serious effects on skin, eyes, liver and kidney. There is also some evidence that 2,3-Dichlorophenol may be toxic to the immune system and may harm the unborn foetus as a result of maternal exposure.

The presence of such chemicals in the river water is particularly worrisome because people are known to spend time inside the water either fishing or washing²⁴.

In Kolak village, several residents complained of an increased incidence in cancer among the villagers. "I know of at least six people afflicted with cancer. There are two cancer patients in my immediate family. There may be more, but we do not know because people don't admit for fear of social repercussions. Until now, 25 people have died of cancer in the village in three years. Also, there is an increase in cases of paralysis", says Haribhai Tandel²⁵.

To make matters worse, Government-run primary health care centres are replicates of their counterparts elsewhere in the country no doctors, no medicines. The PHCs do not function, and many of the doctors in the PHCs tend to run private practices. As a result, the poor are compelled to go to government hospitals or quacks, the middle class to the private clinics and the rich go to Mumbai, says Dr. Kharas.

Many of the residents of Vapi town and nearby areas, who are workers in the industrial estates, are subjected to even more intense pollution inside the factories they work in. In a survey of worker health and safety situation in Ankleshwar, occupational health expert C.G. Pandya states that the conditions in Vapi factories are even worse than those at the newer Ankleshwar industries. However, the conditions at Ankleshwar are damning enough²⁶.

Almost 80 percent of workers were not using personal protective equipment, the effects of air pollution, particularly on workers, at present exposure levels include respiratory and irritation troubles

²² Excerpted from D Santillo, op cit. 1996. Page.15

²³ Most of this section is excerpted from Sax NI and RJ Lewis. Hazardous Chemicals Desk Reference

²⁴ Cited in D Santillo. Op cit. 1996. Page 18

²⁵ Interview with Haribhai Tandel, Ex- sarpanch, Kolak Village, 23.1. 1999 at 12.00noon

²⁶ CG Pandya. Risks in Chemical units. 1992, cited in Edwards B. The Stranger. Greenpeace, November 1996

in 77 percent to 82 percent of factories. Adverse effects on skin and eyes were noted in 86 percent of units.

The only mention of a health study in Vapi identified as a pollution hotspot by the Union Ministry of Environment appears in the 1995-1996 and 1996-1997 Annual Reports of the Ministry of Environment and Forests. The study or its status finds no mention in the subsequent Annual Report.

2.3 Air

Train commuters say that they recognise Vapi by the overpowering stench in the air. Air pollution due to industrial emissions is a perennial problem in Vapi, as it is in the neighbourhood of other industrial estates in the country. However, virtually no Government data exists or is made available on the quality of and contaminants in the air in Vapi's surroundings.

The visiting team from IPT personally experienced the stench in the air. At some places, the smell of organic aromatic compounds was evident.

Local people complain that industries store their air emissions in pressurised spheres and release it after nightfall. "The air at night is unbearable. Trains are routinely delayed outside Vapi because of poor visibility at nights", says Deojibhai Tandel, member of parliament from Daman & Diu²⁷.

There is almost no data or systematic information available about the air pollution in the estate. The monitoring done by GPCB under the National Ambient Air Quality Monitoring programme data does not represent what people can obviously feel all the time in the estate. Also the parameters for which monitoring is done are SO_x, NO_x and SPM only. This is obviously inadequate, considering the complexity of chemical combinations in the industrial emissions.

It has been found by various studies in western countries that there is no safe threshold for air pollution below which there are no adverse health effects. This has been found even for the ambient air quality standards in the US for 1996²⁸.

2.4 Water

Members of the Tribunal witnessed the extent and widespread nature of pollution in Valsad district. During visits to Daman, Warkhurd and Kolak villages, various stretches of the Damanganga and Kolak rivers, the minor streams such as Bil Khadi and Pariyari Khadi, members of the Tribunal witnessed streams of varying colours, odours and acidities.

There is no dearth of prima facie evidence that the waters of Vapi are polluted and that the source of pollution is the industrial estate(s)²⁹. Acidity tests done on 23.2.1999 in the presence of the Tribunal members, using the water-testing kit provided by the Central Pollution Control Board, revealed pH levels of various streams as ranging from 3 to 6 severely to mildly acidic.

Villagers at Kolak and Wankhurd were among those who complained that even their groundwater was contaminated. At least one open well in Kolak village has been closed because the water has been rendered unusable due to industrial effluents.

²⁷ Interview with Deojibhai Tandel, member of Parliament from Daman & Diu, 23.1.1999

²⁸ Particles in our Air, Ed. by R Wilson., JD Spengler, 1996, pp.125-126, Harvard University Press

²⁹ Trip reports of members of Tribunal visiting Valsad district.

Villagers are forced to use the water, often even for drinking, because of the lack of alternative sources. However, as the following paragraphs will establish, any contact with such contaminated water can have serious effects on the health of exposed populations.

2.4.1 Complexity of Waste Streams:

The only known study to have attempted to comprehensively inventorise the contaminants in the industrial effluents from Vapi was conducted in 1996 by Greenpeace. The exercise, though limited to analyses of effluents from three sources, clearly revealed the complex nature of industrial effluents, and the sophisticated equipment required to monitor them.

A characteristic common to many of the waste streams analysed was their complexity, a factor which is generally acknowledged but not currently addressed by regulatory authorities. Such complexity has far-reaching implications for the assessment of effluent quality and prediction of the likely impacts of such waste streams once they are released³⁰.

Take for instance the samples of sludge waste taken by a Greenpeace scientist from an open channel adjacent to an operating chemical plant in Vapi Industrial Area. Of a total of 56 organic compounds isolated from the sample, 36 were reliably identified. Of this, 19 were organochlorines, including chlorobenzenes, chlorinated terphenyls, hexachlorocyclohexanes and high levels of mono-, di- and trichlorophenyls (PCBs)³¹. Organochlorines, as a class of chemicals, contain some of the most persistent and toxic substances ever known to humankind.

It has to be mentioned at the outset that even the best of scientists with the access to the most sophisticated technology admit that effects of chemicals on life is not fully understood. Our existing knowledge on the toxicities and mechanisms of action of organic chemicals is extremely limited³². This problem is further compounded by the presence of combinations of chemicals, particularly where effluents from a range of industrial units are mixed prior to discharge to the environment. The resulting combined effluent may have toxicological properties, which are wholly unpredictable³³.

Santillo et al (1996) also report that a number of recent studies have found strong synergistic (i.e more than additive) interactions between chemicals, in some cases enhancing the toxicity of individual components several hundred fold³⁴.

It is known that the monitoring mandated by law which is often not done or done improperly is only for a limited range of parameters, including total dissolved salts, total suspended solids, COD, BOD, pH, conductivity and a few metals. This limitation totally ignores the potential and more serious health hazards that can be caused by the vast range of organic pollutants (including some persistent chemicals), many of which were found in Vapi's effluent stream.

The complexity of the waste stream also has a bearing on the viability of waste management practices. Along with the highly persistent nature of many of the contaminants recorded, effluent complexity also places severe limitations on options for effective waste management³⁵.

³⁰ Santillo D (1996).Op cit. Page 15

³¹ Santillo D (1996).Op cit.

³² Santillo D (1996).Op cit.

³³ Santillo D (1996).Op cit.

³⁴ Santillo D (1996).Op cit.

³⁵ Santillo D., Stephenson A., Labounskaia I. And Siddorn J. A preliminary survey of waste management practices in the chemical industrial sector in India: Consequences for environmental quality and human health. GRL Technical note 96/8, Greenpeace Research Laboratories, UK, 1996, pg.21

Although industrialisation in Gujarat has proceeded at breakneck speed since the 1960s, the infrastructure to protect public health from industrial hazards is medieval at best. The 1996 Greenpeace study, for instance, employs techniques of Gas Chromatography/Mass Spectrometry screening to characterise industrial waste streams. Currently, neither the Central Pollution Control Board, nor regional corporations (state pollution control boards) have the instrumental capability to carry out the type of organic screening analysis which was employed in the current (Greenpeace) study³⁶.

Because monitoring techniques and parameters do not address the presence of organic compounds in waste streams, these pollutants as a class remain largely unaccounted for and unregulated in the waste discharges from industry in India. Santillo et al conclude that parameters such as BOD, total oils and total phenols may give some indication of the extent of organic contamination. This leads to the situation in which, providing some physical, chemical and biological parameters fall within legislative limits, effluents which may still be heavily contaminated with persistent organic pollutants are considered acceptable for discharge.

The Gujarat Pollution Control Board's recommendations for waste management are indicative of this shortcoming in monitoring capacity and the lack of political will to acknowledge the shortcoming. For instance, common effluent treatment plants, incinerators and landfills are proposed as solutions for the highly toxic liquid and solid hazardous wastes from chemical industries.

It can be categorically stated that none of these technologies can be expected to protect public health from chemical exposure. All landfills are known to leak; all incinerators are notorious for air pollution; and common effluent treatment plants fail miserably when it comes to protecting environment and public health from heavy metals and persistent organics.

The reason is simple: When waste treatment plants are in operation, they are commonly designed to address a very limited number of physical (pH, conductivity, suspended solids), biological (BOD, COD, coliform counts) and simple chemical nutrients (nutrients, oil and grease, phenols, some heavy metals) parameters. While such CETPs may well address part of the problem relating to high loading of surface waters with degraded organic material, BOD, solids and nutrients, these plants are fundamentally incapable of degrading or detoxifying the wide range of heavy metal and persistent organic contaminants which are also present. At best, they can achieve a redistribution of these contaminants from the liquid to solid sludge phase³⁷.

The state regulatory authorities have to rapidly move from their now-proven-to-be inadequate pollution control exercises to pollution prevention. Toxic technologies and toxic inputs should be phased out and replaced with non-toxic processes. If this is not possible, that production process or product should be sacrificed in public interest.

2.5 Access to Information

Response Of Government Authorities: Exacerbating the problem posed by absence of quality studies and data is the reluctance of the Governmental authorities to share information with local people. People of Kolak, Magod-Dongri, Daman, Umarsadi have time and again complained of fish kills on their shores but there is very little information available on what is causing these kills, what are the pollutants available and so on.

³⁶ Santillo D. (1996). Op cit

³⁷ Santillo D. (1996). Op cit. Vapi-Valsad

GPCB monitors the pollution and effluent quality of the area but this information is not available to the citizens of Vapi or surrounding areas. A new landfill site is proposed for the Vapi estate, but a personal visit to the village revealed that the people of the village Karvad were not at all informed about what sort of waste was going to be dumped or about the potential adverse health effects caused to it³⁸.

A health survey in Vapi commissioned by the Union Ministry of Environment, and mentioned in their annual reports, is yet to be published or made available to local people in Vapi.

In a sense, with regard to protection of its citizens from environmental pollution, the government machinery has failed. Even the resident district collector admits: We are trying our best with what limited law enforcement machinery is available with us. The Government does not have sufficient manpower for even existing work³⁹.

Data, where available, is highly unreliable and misleading. For instance, in affidavits submitted to the Supreme Court, the Gujarat State authorities have cited self-contradictory figures for the quantum of hazardous wastes generated in the state. The figure varies from 0.4 million tonnes to 3.2 million tonnes per year. Also, the GPCB claims to have identified 1,346 hazardous waste generating units in the State of Gujarat. However, the same agency states in a different submission to the Supreme Court that it has granted authorisation for 1,421 units 75 more than it has identified⁴⁰.

2.7 Recommendations:

1. The environment and natural conditions in Valsad district are most suitable for farming, horticulture and fishing. The area is also known as the fruit basket of Gujarat. No further development should be planned for the district at the cost of these already thriving economic activities. In fact, proper pricing policies for the produce of above said activities would substantially help develop the district.
2. Many common property resources are being diverted to the industries, and they are despoiling much more by discharging effluent and hazardous solid waste into rivers and ground water. Common property resources should not be diverted to or spoiled by industries at the cost of the above said thriving activities.
3. In the short term, damage done to fishstock due to release of toxic effluent into the fishing grounds should be financially compensated to the fisherfolk. In the long term, quantity of effluents has to be reduced enough and be made benign to prevent any damage to fishstocks.
4. Reduced production of mangoes and other fruits, rice, fish and quality of these indicate the effect of industrial pollution on agriculture, horticulture and fishing. Studies on the adverse effect on these activities should be carried out and measures should be adopted to prevent any further loss.
5. Adverse impact on people's health in areas surrounding the industries should be studied in detail and appropriate compensation should be instituted. The irresponsible industries should be made to bear the brunt of the costs. Health services of the government should be upgraded to deal with the effects of industrial pollution on public health.

³⁸ Personal Visit on 19th December 1998

³⁹ Meeting with Resident District Collector, Valsad, on 23.1.1999 at Circuit House Conference Hall, Valsad

⁴⁰ Various affidavits filed by the GPCB in the Supreme Court in the matter of Research Foundation for Science, Technology and Ecology v. Union of India (Citation to come)

6. It has been found that the Ministry of Environment and Forests has been carrying out an epidemiological study in Vapi Industrial Estate. This study should be made public immediately.
7. Many industries operating in the Vapi region are engaged in the manufacture of hazardous chemicals. It is imperative that occupational health surveys be carried out at regular intervals in connection with epidemiological studies and workers of factories.
8. Regular testing, monitoring and regulation of the effluent and hazardous solid waste discharge should be done and results should be made public.
9. Poly Chlorinated Biphenyls (PCBs) have been found in the waste streams. These are extremely toxic and persistent pollutants that have been banned widely by various countries, and a global ban by the UNEP is in the making. The Gujarat Pollution Control Board laboratory needs urgent upgradation and training of personnel capable of testing for these and other extremely toxic chemicals.
10. Industries have caused pollution of the surface and ground water. Hence they should take the responsibility of supplying pure water for drinking and domestic purposes to the villages.
11. Industries should be forced to draw raw water from down stream of their effluent discharge points. This would force them to clean up their act.
12. "Right to Know" for employees as well as common people should be implemented comprehensively and government agencies as well as industries should furnish all information immediately when requested.
13. Ministry of Environment and Forest should publish an annual "Survey of Environment" of this polluted area.
14. The State Regulatory Authorities should move rapidly from the now proven to be inadequate pollution control techniques to more comprehensive pollution prevention technologies.
15. No new industries should be permitted in the area until proper regulation of existing industries can be done and the level of pollution declines.
16. A Regional Pollution Release Inventory, based on the US Toxics Release-Inventory should be enacted by law and monitored properly by the GPCB.

Chapter 3 ANKLESHWAR

1. Paryavaran Suraksha Samiti (PSS)
Through its activist Anand M.
At. Katindra, Po. Pipadhara,
Via Rajpardi, Dist. Bharuch
Pin – 392 115

2. Taj Bashir Ahmed
Activist of the Samiti staying
Tal Faliya, Chautta Naka
Ankleshwar

Petitioners

Vs.

1. Gujarat Pollution Control Board
Shed no. C-1, 119/3, GIDC Estate
Bharuch – 392 001

2. Gujarat Industrial Development Corporation
GIDC, Administrative Building
GIDC Estate, Valia Road,
Ankleshwar – 393 002

3. The Collector
Near Court Campus Bharuch

Respondents

Paryavaran Suraksha Samiti (PSS), the petitioner, is a network of activists working in Bharuch, Baroda, Surat and Valsad districts. The PSS works on issues concerning the impacts of various projects on the lives of common citizens and poor people engaged in primary productive activities and the environment.

Respondent No.1 is the government authority in charge of monitoring and controlling pollution in the area. Respondent No.2 is the industrial

The petition has been filed to draw attention to the pollution in the Industrial estates and surrounding areas of Ankleshwar.

BACKGROUND

Ankleshwar town is in Bharuch district and is located on the Bombay – Ahmedabad highway. About 78,000 people live here.

The industrial estate at Ankleshwar was established in 1974 and is spread over 1,600 hectares. 1,500 small, medium and large industries are established in this industrial estate. The Ankleshwar Industries Association (AIA) lists 220 chemical, 156 dyes and dyes intermediates, 196 engineering, 11 insecticides, pesticides, 69 pharmaceutical, 81 plastic, rubber and leather and 201 textile units

operating in the estate. About 60,000 to 70,000 people work in the industrial estate and the majority of them work as contract labour.

The land notified has been acquired by the Gujarat Industrial Development Corporation and used for the industrial estate. The surrounding land remaining with the locals has also been adversely affected due to acidic effluent and indiscriminate dumping of toxic solid waste.

Being among the biggest industrial estates, literature churned out by the Industries Association and Government departments may talk about the employment it generates, the products it contributes to the economy and the octroi and excise it adds to the state coffers. The picture is indeed rosy if one is looking for statistics on paper. It is quite another matter if one is to personally visit the estate or harbour the illusion that any environmental law prevails here. An industrial estate functioning for over 25 years would be expected to have the minimum infrastructure required to deal with its air pollution, effluents and solid waste.

3.1 SOLID WASTE

The 1994 figures furnished by the Central Pollution Control Board indicate that units functioning in the industrial estate discharge 123 tons of hazardous waste daily. This solid waste has been dumped since the last 25 years along the roadside, around open water bodies, in open channels, in private fields, etc.

3.1.1 Sites visited

3.1.1.1 Valia Road-dump site

The dump site on Valia Road was very large and covered with thorny bush. Around two hectares of land was being utilised, illegally, for dumping hazardous waste. Numerous mounds of hazardous waste of varying kinds were noticed. Dark brown, ferruginous, carbon black, copper green, violet, azure blue and off gray sulphatic or phosphatic sludges were the predominant colours and forms. Most of the waste is contaminated with heavy metals and used activated carbon was also seen in large quantities. Activated carbon is used to neutralise (or absorb) toxic elements from toxic waste. Therefore the used carbon is a significant cause of concern as it contains the absorbed toxics in high concentrations. This problem is exacerbated by the fine-dust nature of the carbon dust which increases the mobility of the waste through water and air.

This dumping site was totally unlined, and will result in leachates percolating into the ground and contaminating the ground water.

There was also a block of residential apartments in the vicinity. City waste, brought by a tractor twice a day, is also dumped on this site. Women conduct the dumping activity and are paid Rs.30/- per day. The women told the team that they often fall sick and are afflicted regularly by headaches, itching, fever etc. They have been working with the same contractor since the last 5 to 7 years. The team noted that the women were not wearing any protective gear such as gloves, gum-boots or goggles. Raggpickers i.e. women and children were sorting plastic from waste, about 4 to 5 kgs. of plastic is collected and sold at Rs.3/- per kg. Cattle could be seen grazing only a few metres away. Industrial waste dumped indiscriminately proves hazardous not only to the soil and water but also to women and children rummaging through it to recover saleable wastes.

The industrial estate has effluent channels running all through it. The underground effluent pipeline has open manholes at several points; at one such open manhole the team observed red and blue dye

waste. Throughout the chemical zone there is a strong odour of chemicals and the foul smell of pesticides. The team was told that because of recession the industries were not working at full capacity.

3.1.1.2 Heubach Industry

Heubach industry manufactures pigments that are copper or zinc based. The dumping activity was conducted in acquired land inside the factory, but illegal dumping of the same material was also noticed outside the premises. The landfilling operation carried out with lining of the floor with mats, was far from satisfactory as the matting was not found to be continuous, nor the sides of the landfill were covered. With such shabby lining, leaching from the dump cannot be prevented from contaminating ground water. The copper blue colour of the sludge indicated that it was probably rich in toxic copper metal.

The workers involved in the dumping were not given any protective gear such as gloves, gumboots or goggles. The team noticed that the skin of the hands of the workers had turned blue. They were contract workers and were not aware of the hazards involved with their job. A 16 year old worker informed the team that those employed in the handling of waste are seasonal migrant labour the majority of whom are tribal people.

3.1.1.3 Sarangpur nullah

From Heubach Industry to Sarangpur nullah, towards the railway line, the entire land on the bank of the Khadi was a sea of dumps of all colours, shapes, sizes and textures.

Along the trickling water course the team noticed large bags of unused salts and sludges with a pungent smell that caused itching when touched. The riverbed was merely a dark sludge and the soil and the bank in contact with water were also dark black. Part of the dump is on government land and the remaining on private land. In the vicinity of the dump the surrounding fields were observed to have lower crop growth and wilting due to the dumping. Patches of agricultural land supporting pigeon peas on the bank had ricketti weathered growth with sickled beans. The air was loaded with fine dusts from the dumps and the soil around was totally contaminated. The Sarangpur dump site contained dye manufacturing waste, activated carbon waste etc.

The dump site was not lined. An activist with the Pariyavaran Suraksha Samiti then informed the team that the leachate had entered the ground water and that about 15 borewells were seriously contaminated and consequently abandoned. The air pollution was also apparent. The air is polluted, more so in certain directions. The poor bear the brunt of the air pollution. The predominant wind direction is from southwest to northeast. The company officials have their homes in the Southwest direction. Slums inhabited by migrant labourers and poorer farmers are concentrated along the Northeast periphery.

3.1.2 Findings

Unscientific And Illegal Dumping Of Solid Waste: The dumping is done in the most unscientific manner and without any lining. Water getting into the landfill and mixing with chemicals produces a toxic leachate, which is pulled underground by gravity until it reaches the groundwater level. Landfills leak poison into the water supply. Ground water once contaminated cannot be cleaned and must be considered permanently destroyed thereby diminishing the underground water source, which in any case is limited. Intermixing of different waste could lead to influences on the environment that are not known nor anticipated and are unpredictable, to say the least. Hazardous solid waste landfills also emit toxic gases into the surrounding air.

Recently secured landfills have been constructed at Ankleshwar. The highly publicised 'landfill with German technology' developed at the estate and presented as the ultimate solution has but 160 members of the 1500 or so industries at Ankleshwar. 90% of the units are dumping solid waste illegally and in an unscientific manner. The effectiveness of the secure landfill is also questionable. This landfill has been prepared on the basis of German sanitary waste landfill technology that is used in Germany for city waste landfills. In Ankleshwar the same technology is being used for toxic waste dumping.

Various studies conducted in different parts of the world show that all landfills, even those lined properly, eventually leak. A study about landfills was conducted by Geraghty & Miller of Port Washington, NY, one of the nation's leading hydrology consulting firms, under contract to EPA (U.S. Environmental Protection Agency). "This study provides important evidence that all landfills, lined or not, all contaminate groundwater. Lined landfills will contaminate groundwater more slowly than unlined landfills, but the long-term effects will be the same: someone's groundwater will become contaminated whenever municipal solid waste or industrial waste or legally hazardous wastes are placed in the ground¹."

3.2 WATER

A team of Central Pollution Control Board scientists visiting Ankleshwar in September 1994 noted that the industrial estate discharges noxious gases, 7,000 kilolitres of wastewater and 123 tons of hazardous waste daily.

The industrial estate draws water from the Ukai dam though the dam was constructed for irrigation purpose. 60% to 70% of this water intake is discharged as effluent through gutters and canals into the Narmada.

The industries indiscriminately dump solid waste on adjacent lands and liquid wastes are discharged into open gutters. The underground drainage provided by GIDC is used by only 80 industrial units and the remaining industrial units discharge effluent in open road side channels. The discharge has polluted water courses and irrigation canals affecting fields, wells, human beings and animals.

Undoubtedly one of the most serious impacts of industrial pollution is the contamination of surface and ground water

3.2.1 Sites visited

3.2.1.1 Amlakhadi:

The team visited Amlakhadi, which was a natural water course but has now become an effluent carrying channel. There was no lining for the channel and no protection for the banks. The flow was dark brown and the air carried a pungent smell of organic compounds. The effluent was highly acidic and pH ranged between 1-3 (7 is considered normal pH). The team was informed that 6 channels carry the effluent from the industrial estate and 70% of the effluent flows into the river Narmada. Only around 150 industrial units utilise the Common Effluent Treatment Plant.

People working in the area told the team that reports published by the authorities were often misleading. In reports publishing the status of Water Quality of major rivers of Gujarat State authorities deliberately collect water samples from the river upstream to denote that the river is not affected by effluents.

¹ Rachel's Hazardous waste News #71 in Annexe 3

3.2.1.2 Slum Colonies

Bapu Nagar-II and Yogi Nagar area slum colonies mainly housing migrant labour from Uttar Pradesh.

The groundwater in this area is contaminated. The team observed that the water drawn from hand pumps was yellow in colour and smelled of organic chemicals. Previously the Nagarpalika supplied water through tankers but this supply has ceased and the residents are compelled to utilise this contaminated water for drinking and domestic purpose. Women usually walk for 2 kms to fetch clean water from GIDC area but they are often forced to drink the contaminated water. There is no public transport within GIDC.

The water in the bore wells is highly alkaline and may have traces of chromium. Ahmed Ali Khan also a resident of the area showed the team eruptions on his back. These eruptions on his skin were due to bathing in alkaline water.

Bapu Nagar I is on Rajpipla Road. The ground water in this locality is severely contaminated and the colour of the water ranges from yellow to orange. The water when heated had a distinct and strong odour of volatile organic compound. The team was told that the water when exposed to sunlight turned red. This water is not even fit for washing and bathing. Ms. Zarina Yakub told the team that the women had to spend 2-3 hours to get clean water and some of them often returned empty-handed.

3.2.2 Findings

3.2.2.1 Indiscriminate Release of Effluent and Contamination of Water

Untreated effluent is released into 6 channels and more than 60% of this effluent is discharged into the Narmada. Many of the industrial units release effluent into streams on plots of open land which are in the vicinity of agricultural fields. Tankers collect effluent from industrial units and discharge it during the nights. There is no treatment of the effluent prior to discharge. This indiscriminate discharge of untreated effluent has resulted in polluting and contaminating surface water and groundwater. The most basic parameters to test water is to check the pH level. The testing carried out in the presence of the team indicated high pH level i.e. between 2 and 3, indicating highly acidic water.

3.2.2.2 Drinking water

Nihal, a youth from Yogi Nagar told the team that as the groundwater is contaminated, GIDC is to supply drinking water. Only limited quantity is brought to the area by GIDC through tankers. However this water reaches only the financially better off residents and those with friends among the tanker operators. A majority of the residents are forced to use water from contaminated bore wells.

Gadkhol also faces an acute drinking water problem. The villagers have made written representations to concerned authorities for supply of potable water but to no avail. The residents complained of health problems. The water from the bore wells smells and is contaminated even though the wells are dug unto 120 feet below surface. In Gadkhol a lengthy process is followed before the water can be used for drinking. Soni Kaka, a village elder described the process by which the contaminated bore well water is made potable. The freshly pumped water that has a smell of sewage and chemicals is left overnight for the smell to diminish, then cooled in a clay pot and consumed. The residents complained of headache, listlessness, burning sensation in the throat, cramps, diarrhoea. A resident informed the team that some of the factories in the industrial estate probably injected their toxic effluent into the bore wells in their premises and thereby directly into ground water, contaminating it.

Paryavaran Suraksha Samiti conducted a survey of 65 bore wells in one area. Of these 55 of were found to be drawing contaminated water. The team noticed that the residents of slum colonies had no

access to clean drinking water and the women walked long distances to obtain the same from buildings. Also vulnerable were single men, many of whom were migrant labor who worked throughout the day and had no option but to use the easily available contaminated water for drinking and bathing.

Despite repeated complaints the concerned authorities are not taking any steps to remedy this problem. No pipelines are laid to supply residents with clean drinking water. In Sarangpur village a bore well supplies water through pipelines to different parts of the village but the bore well itself draws contaminated water.

3.3 Air

Release of Noxious Gases into the Air

The industrial units release noxious and poisonous gases into the air late in the night or early in the morning. The chemical zone has the strong odour of chemicals and smell of pesticides. Land fills also contribute towards emission of toxic gases into the air. The residents, especially children, are suffering from respiratory ailments. GPCB is doing nothing to check and monitor air pollution.

3.4 Agriculture

Sarangpur village is near Amrawati river and Sarangpur khadi. The team visited the field of Mr. Thakurbhai Patel an agriculturist. He owns over 6 acres of land where tur dal and wheat are grown for consumption and cotton is cultivated for sale. The cotton grown is a hybrid seedless variety i.e. Shankar 8 and is sold at around Rs.2200/- per quintal. Mr. Patel has a well with a pump on his field and this draws dark red water, which is used for irrigation. Vegetables were also grown in this field. The team plucked a baby brinjal which when broken open was black in colour and falling. Mr. Patel told the team that tomatoes, which previously grew on his field, had now stopped growing and that the vegetables grown were tasteless. There has been a sharp fall in the agricultural productivity and yield. Five wells in the village were contaminated and draw water that is red in colour.

Sonubhai, the Sarpanch said that all these problems are due to indiscriminate discharge of toxic effluents by chemical industries at night through tankers into streams and wells.

A 30 feet deep bore well supplies water through pipes to different parts of the village. The water from this well is contaminated and not potable. Gujarat Pollution Control Board had tested this water but the results had not been furnished to the local residents.

The District Agricultural Office has recorded that lands in several villages around Ankleshwar have become infertile because of effluents.

Effect of Pollution on Agricultural Yield

The contamination of underground water has adversely affected the agricultural yield in and around the industrial estate as testified by the farmers. The team noticed that tur dal that was growing in fields near Sarangpur Nullah was badly affected especially in the area closer to the nullah where solid waste had been dumped. In Sarangpur village the team noticed that certain vegetables had stopped growing and other vegetables such as brinjals were turning black and rotten before plucking. The effects of pollution on seedlings and grown plants differ in accordance to the species- pigeon pea and tur dal are very sensitive to pollution whereas wheat and cotton are less so. The agriculturists may soon lose their sole means of livelihood due to contamination of underground water. Bore wells dug 100 feet under

the surface are drawing contaminated water. Ukai dam, which was to supply water for irrigation, is also supplying water to the industrial estate.

3.5 Health

In Bapu nagar II and Yogi nagar the residents complained of boils, skin itching and difficulty in breathing due to the venting of untreated blue gases during the evenings. The residents had no access to health facilities as there was no primary health centre

At Bapu Nagar I the residents complained of severe headaches and itching of the eyes in the evenings when gases are released by units in the industrial estate. The residents suffer from itching, irritation and rashes when they bathe with the contaminated water. Despite the incidence of health problems, many of which are environmentally related, the residents have no access to inexpensive medical facilities. Primary Health Centres are poorly staffed and ill equipped. The Jayaben Modi Hospital, the team was informed, has been established by GIDC and caters primarily to middle and upper management of the units functioning in the industrial estate and is too expensive for the workers and residents of slum colonies.

Some of the industries established in the industrial estate are most hazardous e.g. pesticides industry. The workers employed in the industry suffer from occupational hazards and their skin and eyes are affected. No regular medical check up of workers is being conducted. Reproduction related ills may be caused by chemical pollutants in the environment, traces of these pollutants in the works can interfere with the proper development of the reproductive system. Spontaneous abortions, stillbirth, neo-natal death, premature delivery, birth defects, behavioural and developmental defects have also been attributed to chemical pollutants. 90% of all human cancers are attributable to environmental factors and of these 65% - 70% are attributable to a chemical. In most places the residents complained of respiratory ailments, skin itching and boils.

Migrant Contract Labour Employed by Industrial Estate

The majority of the labour force is employed as contract labour. The workers are tribals who come for work purposes from nearby tribal belts or are migrant labour from Uttar Pradesh, Rajasthan etc. The workers are given no protective gear and are not aware of the hazards of the material they are handling. They have no access to medical facilities. The migrant workers face problems faced by men living alone and are also susceptible to STD/HIV/AIDS. The homes of the workers are constructed in places where the pollution is extensive whereas the management personnel reside in less polluted areas. 60000 to 70000 workers are employed by the industrial estate but no facilities are provided and they are susceptible to occupational hazards.

3.6 Response of authorities

The IPT team members met with Mr. B.B.Swain, the Collector of Bharuch district

The team informed Mr. Swain about the grim situation prevailing in Ankleshwar due to the highhanded attitude of the industry lobby. He was requested to effectively intervene to ensure that laws are enforced and people are able to lead a healthy life. In response Mr. Swain told the team that the situation was worse 10 years ago and today a change in the system had been brought about whereby public hearings are held to consider objections and suggestions of interested persons prior to establishing a new industry. A Public Hearing Committee headed by the Collector considers the objections and suggestions and permission for the new industry will only be granted on being recommended by the Committee. Mr. Swain claimed that there was complete transparency on the part

of the State with regard to new projects and all the information with regard to the proposed project was available for perusal of the public. Mr. Swain said that an Environment Impact Assessment Report was a pre-requisite for granting permission for the project. However he admitted that Environment Impact Assessment Reports were available only in English therefore the villagers were unable to understand the contents thereof. Copies of voluminous technical documents cannot be furnished to interested parties and they are required to take inspection of such documents in some office.

The team was told that action was taken in case of pollution and illegal dumping by the Collector's office only if there was a crisis. Accordingly he has closed a factory in Panoli because he received complaints from both locals and industrialists. Action under Section 133 of criminal procedure code had been taken in appropriate cases. Action was also taken against a scrap dealer who used to deal in drums from the chemical industries as in the vicinity of his property cattle deaths were reported. Mr. Swain agreed to investigate the illegal solid waste dumping by Heubach Colour Limited, to facilitate supply of drinking water to pollution affected villages and to conduct surveys to ascertain health disorders amongst villagers residing in the vicinity of the industrial estate. Mr. Swain said that the concerned authorities are taking a decision whereby a percentage of profit earned by industries will be allocated towards providing facilities and amenities to villages located in the notified area. The Collector admitted that new industries were being set up despite the concerned authorities being aware of the irreparable damage being caused to the environment such as contamination of ground water.

Notices had been sent to Gujarat Industrial Development Corporation (GIDC) and Gujarat Pollution Control Board (GPCB) about the visit of IPT team members. Repeated phone calls yielded no results as all those holding responsible positions were reported to be absent.

3.6.1 Direct Participation of the State in Environment Pollution

The State is aware of the damage being caused by the industries to the environment and consequently to the people, but is taking no steps to check the same. Indiscriminate permissions are being granted for starting new industries and expanding existing ones. The State is bending laws to facilitate the industrial lobby and there is no implementation of existing laws. Despite repeated representations no heed is being paid to the woes of the common man. There is no monitoring of the activities carried on by the industrialists. State is taking no action against industries that are discharging untreated effluent despite high visibility of the violation. The residents are deprived of right to livelihood, right to life, right to decent environment and right to enjoy good health, which are fundamental rights enshrined in the constitution. The state is abetting with the industrial lobby in a manner detrimental to the common man. The State should be made accountable for the deteriorating situation. GPCB which is the monitoring authority should be hauled up for dereliction of its duty to monitor, control and protect the environment.

3.6.2 State transferring it's Duties to the Private Sector

The State has failed in performing its duties towards people and has in fact transferred certain of its duties to the private sector. The team noticed that in many places industrialists were supplying drinking water. Such supply of water is irregular and depends on the whims and fancy of the industrialists. The industrial lobby is being absolved of polluting the environment and adversely affecting the lives of people merely because they promise to use a portion of their profits towards welfare activities. The team did not notice any welfare activity being conducted by the industrial lobby.

3.6.3 Privatisation of Public Resources

Scarce public resources are being exploited by private parties. The water from Ukai dam that was to be utilized for irrigation purpose by farmers is today being supplied to the industrial estate. The streams and river have been polluted by the industrialists. This is an encroachment on fishing rights of people. Locals who were using these public resources for their survival are no longer able to derive any benefit from these sources. The industrial lobby is contaminating and destroying public resources without being made answerable for the rape of the environment and destruction of people's lives.

3.7 RECOMMENDATIONS

1. Blanket ban on (a) starting of new industries and (b) expansion of existing chemical industries in this region. In case of expansion of any other industry the Environment Impact Assessment Notification should be strictly adhered to and Public Hearings should be properly held and objections and suggestions submitted should be considered.
2. Closure of polluting industries in the region. Industries that are not conducting their activities in accordance with law should be immediately shut down. The Environment (Protection) Act, 1986, the Environment (Protection) Rules, 1986, the Water (Prevention and Control of Pollution) Act 1974, the Water (Prevention and Control of Pollution) Rules 1975, the Water (Prevention and Control of Pollution) Cases Act, 1977, the Water (Prevention and Control of Pollution) Cell Rules 1978, the Air (Prevention and Control of Pollution) Act, 1981, the Air (Prevention and Control of Pollution) Rules 1982, the Hazardous Wastes (Management and Handling) Rules, 1989, Manufacture, Storage and Import of Hazardous chemical Rules 1989, should be strictly adhered to. No act in violation of prevailing laws should be tolerated. The Collector should in case of pollution take action under section 133 of the Criminal Procedure Code against the polluting industry. The industries which are ordered to be closed down should be asked to pay proper and adequate compensation to the workers.
3. Strict control on solid waste and liquid effluent discharge (a) No waste, both solid and liquid, should be dumped on public land, private land, near agricultural fields in or near water bodies i.e. ponds, rivers, estuaries or sea (b) Solid wastes, if required to be dumped, must be dumped in protected landfills under proper supervision (c) Leachability studies (TCLP) must be conducted prior to dumping. If leachates are found to contain toxic elements beyond permitted values then facilities should be provided in the dump for neutralization or encapsulation. (d) All solid waste dumps should be surrounded by plantations and later covered by soil and vegetation (e) Industries should be encouraged to reuse solid waste for some suitable purpose (f) Regular inventories should be taken of hazardous chemicals and material stored in factories (g) Industrial waste generated should be strictly monitored. (h) No effluents should be assigned to contractors for transport and disposal. (I) Stringent punishment including closure of industries in case of illegally releasing liquid effluent into water channels or wells either by the industry itself or the contractor. (j) Surveillance squad to be established by GPCB or District Collect to monitor illegal discharge of solid wastes and liquid effluent by industrial units.
4. The air and water quality in and around the industrial estate should be regularly monitored by GPCB. This environmental status report should be made easily accessible to the general public.
5. It will be more effective to utilise, indigenous simple technology for effluent treatment for individual factories instead of expensive imported technology. Factories with belching chimneys must have emission trapping devices, irrespective of size, type and location of factory.
6. Expert advise should be taken to remedy and restore the situation. Massive efforts should be taken to clean the ground water, to heal the damage already caused to the sea coast. There should be restoration by plantation and of estuaries by mangroves.

7. The state should ensure that clean piped water? is supplied to the entire region.
8. For the purpose of transparency about the working of the industrial estate, local inhabitants and villagers should be allowed free entry into the premises of the industrial plants. This will remove the feeling of insecurity from the minds of the local habitats and villagers that any clandestine activities are carried on inside the plants. Social audits should be permitted to be carried out by NGOs and experts working in the field of environment. All the relevant data including environment impact assessment reports, technical reports, feasibility report etc. should be made available to the public.
9. The state should sponsor studies with regard to the effect of water and air pollution upon the health of the public.
10. Inexpensive medical facilities should be made available to the public, Primary Health Centres should function effectively i.e. should be adequately manned and well equipped with Medicare, bandages, etc.
11. The Gujarat Industrial Development Act 1962 is a draconian enactment whereby the State is empowered to acquire land for GIDC and the landholder has no power to challenge the acquisition. The Act should be amended to allow the landholder to challenge the public purpose for which the land is being acquired. Establishing of polluting industrial estates is against the interest of the public as can be seen from Ankleshwar's example.
12. Awareness programmes related to pollution and environmental protection should be conducted so as to spread over a large section of people. Posters, hoardings, meetings, group discussions, street plays, etc. should be resorted to create public awareness.
13. Prosecutions should be launched against the polluting industry under Section 15(1) of the Environment (Protection) Act 1986 whereby if the polluter is found guilty he shall be liable for imprisonment or fine and shall have to stop the contravention. Under Section 17(1) of the Act even the State can be held liable if it has neglected to take sufficient steps to stop the contravention.

Chapter 4 MINING

1) Paryavaran Suraksha Samiti
Through its activist Swati Desai
At Kantidra, PO Pipadhara
Via Rajparda,
Dist. Bharuch – 392 115

Petitioner

Vs

Gujarat Industrial Power Corporation Ltd. (GIPCL)
At PO Nani Naroli
Ta. Mangrol
Dist. Surat

Gujarat Pollution Control Board (GPCB)
Belgium Square, 1st Flr,
Silver Plaza Complex
Opp. Linear Bus Stand,
Surat

The Collector
Athwa Gate Circle
Near Police Commissioner's Office
Surat

Respondent

Paryavaran Suraksha Samiti (PSS), the petitioner, is a network of activists working in Bharuch, Baroda, Surat and Valsad districts. The PSS works on issues concerning the impacts of various projects on the lives of common citizens and poor people engaged in primary productive activities and the environment.

Respondent No. 1 Gujarat Industrial Power Corporation Ltd. (GIPCL) is the company carrying out mining activity in the area. Respondent No.2 is the regional office of Gujarat Pollution Control Board responsible for monitoring and controlling pollution in the area and Respondent No.3 is the Collector of Surat district, the administrative head of the area.

This petition was filed to bring to light the adverse effects of mining carried out at the Vastan mine in Mangrol area of Gujarat.

BACKGROUND

The state of Gujarat is on a massive expansion of its power generation capacity. This expansion is based to a great extent on lignite, as no other fuel is locally and readily available. Coal has to be imported from Central or Eastern India and deliveries are not on schedule, liquid natural gas or other petroleum products have to be imported.

Lignite is currently mined in five leases in different parts of Gujarat, in Kutchh and Bharuch districts. The Kutchh lease is for 2040 ha. and the Bharuch lease is for 725 ha. Now GIPCL has begun mining in Surat district in a lease of 1536 ha. It has also constructed a lignite-based power plant of 250 MW capacity, with a future plan for expansion to 625 MW. This will currently require 2 mn. tons p. a. and in the future will require a total of 5 mn. tons per annum for 625 MW.

4.1 GUJARAT INDUSTRIAL POWER CORPORATION LTD

The current mine under development is called the Vastan mine and is close to the north of the power plant. In future this would be expanded by developing three more blocks north of Vastan mine covering 1220 ha. and 520 ha. in the Mangrol taluka (Surat district) and 350 ha. in Valia taluka (Bharuch district-see map 1). All these areas are continuous and contiguous in the mine plan.

Most of the expanding power requirement in Gujarat is because of the rapid expansion of industries and the new investments coming in. Gujarat is ranked among the top five states of India in industrial investments and around Rs. 1,30,000 crores is in the pipeline, apart from infrastructure investments. GIPCL was incorporated by various industries to meet their power needs and has a power plant operating near Vadodara. The Nani Naroli power plant is mainly for industries of Jhagadia and Ankleshwar as said by one of their senior executives¹.

Irrespective of the mineral being mined, mining as an activity is known to devastate the environment surrounding the mine. Not only that, but also all mines themselves cover huge tracts of land which are destroyed forever and taken out of agricultural production. Apart from this, large amounts of wastes are generated in the form of acid mine drainage, overburden, large amounts of particulates in the air, heavy metal contamination of air, soil and water, deforestation, usurping of common property resources like land and waterways, loss of species and hence biodiversity, destruction of natural landscape and so on.

Proper planning and implementation has been known to mitigate some of the effects, but across the world, the impact of mining is still substantial and various mining associations have accepted that the acceptance of mining amongst communities is low all over the world². This is with good reason.

Most of the times, mining extracts a mineral, uses it to some purpose which benefits far-off places. In this case mining is extracting lignite to generate electricity for industries of Jhagadia/Ankleshwar, while local people around Nani Naroli will bear the brunt of all the devastation for generations to come.

The land acquired by the company partly belongs to tribals in the area, approximately 60 % according to some estimates. These tribals are temporarily employed for construction and as casual labour, while their assets have been lost. Often the tribal economy does not know how to deal with cash and hence whatever compensation they have received has not been put to use which would ensure them a regular income as farming did. Not only that, even if they get a permanent job right now with the company, the next generation may not get a job and hence lose out. On the other hand, farming was something they were good at and this would have gone on for generations to come.

Hence it should be understood that compensating by cash for land, to someone who does not know how to deal with cash, is not appropriate as the disparity increases ultimately.

¹ Interview with Gomti Bakariya and Chiya Mangal, members of Mitna Machhi tribe of Warkhur village. 23.1.1999

² Personal Interview, Nogama, Vastan and Surali villages, 18th January 1999.

The mines are also extremely close to Vastan and Surali villages, which have been transformed from a clean and quiet places into villages in the midst of heavy dust pollution and high noise level. This is due to the fact that though lignite is transported by bucket-excavators, large trucks transport overburden.

Also the mineral to overburden ration is around 1:8 which is quite high and has already resulted in a large overburden dump on the eastern side of the mine pit. While some measures have been taken to prevent run-off like a garland canal, these are significantly inadequate and the resultant situation will definitely be detrimental to the surrounding ecology.

Though the company officials claim that the lignite in Vastan mine is low in sulphur content, local people have reported that during the first monsoon itself after mining began, the small rivulet they used for domestic purposes was polluted by acid mine drainage. Skin irritation and burning feet were reported by people who waded through it or used the water³. If things go on like this, acid mine drainage will probably become a major problem for the local people.

At the public hearing, mining affected people were represented by Shri Jayesh Patel of a farmer's organisation, the Gujarat Khedut Samaj. He talked of his experience of living next to a mine 24 hours a day. Mr. Patel told the tribunal members that the noise from mining and related machinery disturbed people living as far as 3-4 km. Water sources had already started getting polluted. Dust raised by mining is drawn to surrounding villages and settles on houses as well as ponds etc. Surali village is facing a loss of water as subsoil water has started depleting. He also voiced his fear over pollution due to fly ash and that it would harm agriculture. He also talked of inherent corruption in such large industries and that most of the leaders as well as those from local institutions were bribed to convince them to sell their land. He conceded that while the price paid for the acquired land was substantial, it definitely did not reflect the value of the minerals under it and hence the farmers were shortchanged. He also said that while they were losing their only livelihood source, electricity was supplied to industries far away. He demanded that at least a quarter of the electricity be provided to the farmers to meet the shortfall they face for irrigation.

Shri Jayesh Patel also complained that the company officials did not provide proper information even after repeated requests and even though their village was affected by mining activity, the company did little for the village.

4.2 GMDC

People affected by Rajparddi lignite mines of GMDC also narrated their experience in front of the panel. They complained of loss of water due to mining in five villages. Also acid mine drainage polluting two waterways, silting of waterways as well as agricultural land due to overburden run-off and high particulates in the whole area. They also told of accidents in the mine endangering a whole village.

The company seemed open to suggestions and claimed that it was putting some of the suggestions into practice. However, as testified by Jayesh Patel, a local resident, was quite afraid to share even basic information and documents of the company.

4.3 Power Plant

³ Personal Interview, Nani Naroli, 18th January 1999.

Electricity from coal fired power plants has been in existence in India over five decades now and more in other countries. The technology is continuously developing.

However, like mining, power plants are known to be major point sources of various types of air, water and soil pollution. The technological changes have reduced some of the impacts and made them marginally cleaner but still, they are major polluters and many countries like the U. K. are moving away from coal based power generation. In view of new knowledge about global warming and the greenhouse gases, coal based power plants are major contributors to greenhouse gas emissions and thus a major player in global warming.

Coal based power plants are also known to contaminate surface as well as subsoil water with heavy metals, increase particulates in the air, contaminate soil with toxic metals and other compounds.

Fly ash generated by coal fired power plants is known to contain heavy metals like chromium, lead, arsenic, copper, molybdenum, cadmium, uranium, cobalt, nickel etc. Fly ash is generated in large quantities and some is emitted into the air contributing to particulates and the rest is collected in fly ash ponds. Power plants have been known to need around one acre of land for fly ash disposal per megawatt of installed capacity. These fly ash dumps ultimately leach toxic pollutants into subsoil water and indirectly usurp a common property resource like ground water from a large area.

It should be noted that extensive testing for heavy metals in lignite at Vastan and other mines has not been done. When inquiries were made with company officials, they claimed, without any substantive proof that only aluminium might be present in this lignite. Other metals were either not tested for or were not found⁴. Hence proper measures to avoid ground water contamination can not be taken for lack of basic data. Prof. Sahu (of the IPT panel) informed that testing for the traces of heavy metals needs extremely sensitive equipment and is rarely done by such companies even though it is known that these traces become substantial amounts due to burning of vast quantities of lignite and coal. Also in coal or lignite, the metals are in a compound form but after combustion are released into the atmosphere or into the waterways and ground water.¹ In this form they are very toxic to aquatic as well as human life.¹

This is a serious lapse on the part of the company.

GIPCL claims to have imported latest technology for clean burning of lignite. However upon being questioned by a panelist about applicability of the imported technology to Indian coals, the company official expressed ignorance. It was surprising that neither the company had consulted BHEL, which had tested this technology for Indian coals, nor GIPCL itself had tested this technology itself before making the investment.

4.4 Recommendations

1. The company should institute proper and complete studies before going ahead with any further work. These studies should incorporate the knowledge of local people and should be completed with continuous consultation with the people themselves, and not only the leaders. Independent persons and not the company should prepare these reports. These reports should be put in the public domain and should be reviewed by people.

⁴ For a detailed discussion of heavy metal contamination due to traces in coal, see “power plant pollution, cost of coal combustion”, Prof. K.C Sahu, *The Hindu Survey on environment*, pp.47-51, and “Morphology and Mineral Chemistry of Coal Ash from Talcher Thermal Power Station, India” by S. Tripathy and K.C Sahu, *Indian Journal of Earth Sciences*, Vol.22, No.4, pp.137-148, 1995.

2. Resettlement is not the only obligation of the company, but rehabilitation is as well. It should be borne in mind that the level of living of displaced persons should be higher than their previous place of living. People should be compensated by land for land and not by cash.
3. Moving tribals from agricultural economy to cash based economy creates a myriad of social problems as tribal people do not know how to manage cash. They have no knowledge of how to use cash to get a sustained income etc. Hence social backups should be provided on a long-term basis to mitigate these problems.
4. Basic needs (e.g. groundwater) should not be depleted at all. If something like that happens, the surrounding communities should be compensated immediately and extensively.
5. A proper mining plan should be made with extensive consultation with local people. It should have a detailed ecological management part prepared with the help and agreement of surrounding communities. Such documents should be openly shared with all concerned parties as well as local people. GIPCL has proved itself quite closed on this aspect.
6. In general, information should be openly shared and provided to everyone.
7. An overall review of energy policy and consequently the industrial policy seems in order for Gujarat. The path, on which its industrial development is set, the problems are going to be very big and this has created a large demand for energy. Both need to be properly reviewed.
8. Geothermal, wave and wind powers should be well explored and good fiscal/financial incentives should be given to these sources of power as against traditional coal based thermal power.

Chapter 5
HEMA CHEMICALS
Occupational Health and Safety

1. Vyavsayik Swasthya Suraksha Mandal [VSSM]
Through Jagdish Patel
43, Srinathdham Duplex
B/h. Dinesh Mills,
VADODARA - 390 005

2. Ramkailash Saroj
Activist of the Vadodara Kamdar Union
Working in Hema Chemical Industries
C/o 101, Shree Krishna Apartment no. 2
Opp. Kothi Police Parade Ground
Raopura, Vadodara - 390 001

Petitioners

Vs.

1. Hema Chemicals
13, BIDC, GORWA
Gorwa, Vadodara

2. Sr. Factory Inspector
Kubar Bhavan, Kothi
Vadodara

Respondents

Vyavasayik Swasthya Suraksha Mandal, Petitioner No. 1, is an organization working in the field of Occupational Health and Safety. Mr. Ramkailash Saroj, Petitioner No. 2 is a worker in a factory known as Hema Chemical Industries and an activist of the Vadodara Kamdar Union. Petitioner No. 2 contends that he is a victim of occupational disease.

Respondent No. 1 is Hema chemicals Industries Respondent No. 2 is the Factory Inspector, who is the authority appointed under the Factories Act 1948, concerned with protection of workers health and safety at work.

The Petition has been filed in respect of the alleged failure of the said company to ensure the health and safety of the workers in its factory.

BACKGROUND

Hema Chemicals employs a total of about 250 workers. The said company manufactures Sodium and Potassium Bichromate. The company has two units, (a) Hema Chemical Industries, Unit No.1 & (b) Hema Chemical Industries, Unit No.2 each employing about 125 workers. The process for manufacture requires crushing chromate ore into small pieces and heating it at 1200 degrees Celsius in a furnace alongwith limestone and soda ash. Chrome ore and other raw material is fed at one end of the more than 100-ft. long furnace manually. The material is manually pushed toward another end of the furnace, to be ultimately emptied into handcarts for further processing. A large quantity of dust is generated during this process. Workers are also exposed to elevated temperatures, infrared rays and other hazards.

1.1 MEDICAL CONDITION

The Petitioners submit that bichromate is hexavalent chromium which is a well known carcinogenic which causes chronic rhinitis, chronic chemical pharyngitis and nasal septum perforation. It is also known to cause lung cancer, deep slow healing ulcer which is referred to as chrome ulcer, pigmentation of tooth and perforation of ear drums. It may also cause pulmonary oedema, kidney damage, dental carries, skin sensitization, toxic jaundice leading to damage of liver, and lung fibrosis. A copy of the Certifying Surgeon's report¹, dated 1-5-98 was also submitted to the Tribunal. It confirms that 43 workers have nasal septum perforation and 23 suffer from sensitizing dermatitis. However, it is submitted that a systematic complete examination has yet to be done. The Petitioners submit that the technology employed by the management is unsafe and have relied upon the complaints filed against this Company with the Factories Inspectorate. The Tribunal members were also informed that the Company has a history of very callous attitude in safety issues. Copies of the press articles and interviews with the manager/proprietor Mr. Mahendra Patel were also submitted to the Tribunal².

We visited the factory premises of the company late on the evening of January 21, 1999. At least 60 workers were seated outside the factory. They³ said they were on strike. The workers explained the manufacturing process to us.

They mentioned that they were given bad quality masks and gumboots were not given because the management said they are too expensive. We met Ramkailash Saroj⁴, he showed us a deep slow healing ulcer on his foot. He said that he had this ulcer for the past seven years and was given some treatment but it has not helped him at all. He mentioned that even the ESI Hospital had stopped treating him. He said he was suspended from the Company's services for the past one and a half years. He mentioned another colleague of his Mr. Kiransinh Chauhan, suffering from a similar ulcer, may have to have his leg amputated. Mr. Ramkailash Saroj also said that the ESI Hospital has refused to show reports of medical investigation and treatment. He said, he had at least a right to know what the problem was. The following paragraph narrates the working of the Occupational Disease Centre and the ESI as experienced by the workers and described to the Tribunal members.

The ESI has set up an Occupational Disease Centre (ODC), which works once in a week for two hours only. The so-called Centre does not have any specialist in occupational health. The injured person, i.e. the worker himself cannot go to this centre unless his/her employer or ESI dispensary with which one is attached, refers him to the ODC. Detailed history, which is the most essential part of any occupational disease to be diagnosed of workplace exposure, is not registered. The workers also told us that there is no specific facility for confirming occupational diseases like lead estimation, chrome estimation or ILO pneumoconiosis X-rays. No cases are referred to the NIOH or ESIC Regional Occupational Disease Centre at Bombay. At the end of examination by this Centre, no report is given to the IP and after considerable delay a "Certificate" is posted to the employer. Neither copy of the Certificate is given to the IP nor is he informed separately about issuance of the Certificate. The Certificate reveals the date of examination and vague recommendations like "you are advised to visit Skin OPD for further management." Neither is the diagnosis declared, nor is any clarification made as

¹ The translation of a copy of the certifying surgeon, Dr. SK Varma's report dated 1-5-98, submitted in the Industrial Tribunal is in Annexe 4.

² Copy of the press article is in Annexe 5.

³ Personal interview, 22nd January 1999.

⁴ Personal interview, 22nd January 1999.

to whether the problem is related to the work done. The ESIC local office refuses to process further the claim form for Occupational Disease without the "Certificate" from the ODC.

Some workers⁵ complained of gas trouble and others said that they had vomited blood. Many workers put strings through each of their nostrils to show the nasal perforation. The workers mentioned that they are constantly threatened that if they go to the press or talk about their occupational diseases they will be suspended. All the workers complained that despite several requests complete medical examinations were not conducted and even if some tests were taken of workers who were suffering from some health problem the test reports were not given to the worker.

To illustrate the gravity of the case of unsafe working conditions, the Petitioners submitted the findings of a report of the Gandhi Labour Institute. The survey was carried out by an expert team in 1980, and covered 206 units in Ankleshwar. The team found 61 % units surveyed had unsatisfactory working conditions, 39% fared better and only 1% had the best working conditions. The report further stated 55% stored chemicals in corroded tanks and proper periodical inspections were not carried out, 63% units did not have emergency escape routes, 68% of the units accepted that they polluted air and 80% accepted that they polluted water.

The Gandhi Labour Institute report also stated that 77% of the chemical units used chemicals which can cause respiratory problems, 86% used chemicals causing skin problems and 87% used chemicals causing problems related to vision.

1.2 OTHER ISSUES

During the depositions, the workers informed us that every year they enjoyed "Bhai-Beej" as a holiday. In 1998 the management of the company refused to allow a holiday on Bhai Bheej. The workers mentioned that this was done deliberately and only to antagonize them, since the work load was not extraordinarily heavy at the time. The workers took mass leave to protest the decision. Rs. 500/- was deducted from the salary of each workman as a punishment without any legal notice or inquiry. The workers then filed a case against the company for the illegal deduction. They have obtained a favorable order from the Industrial Tribunal, Vadodara. Yet, the company has not paid the workmen. The Tribunal members inquired what the wages of the workmen were. They said that wages ranged from Rs.1,400 to 2,000 per month.

The Respondents remained absent, despite notice.

5.3 FINDINGS IN THE HEMA CHEMICALS CASE

The situation in Hema Chemical completely shocked each and every member of the Tribunal. The members of the Tribunal state that this is probably one of the worst cases of occupational diseases and callousness on part of the company, that has come to their notice. There is no question that workers have a right to information of the hazards they might face in the course of employment. Workers also have a right to safe working conditions. The Factories Act lays down detailed provisions for safety measures to be adopted at the work place. The Company and the statutory authorities have miserably failed to implement even minimum safety conditions.

⁵ Personal interview, 22nd January 1999.

It also came to the attention of the Tribunal members that the management of the Company is unduly harsh. The Tribunal members have seen the ulcers and nasal septum perforations caused due to the exposure to chromium. The workmen have deposed that they do not have adequate safety gear and more over are not given medical attention as required by Factory Act and Gujarat Factory Rules. Instead of expressing concern or remorse for the predicament of the workmen the Proprietor of the company Mr. Mahendrabhai Patel in a newspaper interview said that the workers have deliberately made holes in their noses. This remark is despicable.

Dichromate manufacturing is a hazardous process as per the provisions of the Factories Act, 1948. The occupier is therefore, required to have periodic medical examinations and maintain accurate and up to date health records for the workmen working in a hazardous process. The Company is required to disclose information regarding hazards, establish safety committee, and make an emergency site plan. The Company should be put to strict proof of having satisfactorily complied with.

It is therefore necessary that the Company should have disclosed information regarding the hazardous process and materials. The Company is also required to formulate a detailed policy with respect to health and safety of the workers employed and formulate an on site emergency plan. The Company should provide copies of these documents to the workmen or their union.

The Tribunal also found that the case of deducting wages at the rate of Rs. 500/- for one day leave on a festival, which was not granted to the workers on request, is just another instance of this company's very harsh and callous treatment of workmen. What was even more shocking was the fact that despite an Industrial Tribunal order in favor of the workers the Company has not paid the workers their dues.

5.4 RECOMMENDATIONS IN THE HEMA CHEMICALS CASE

Although these recommendations are made by the Tribunal it is the impression of the members of the Tribunal that an recalcitrant and harsh management of this company is unlikely to seriously consider the following recommendations. Thus although these recommendations are made in good faith it is believed that the workers may have to initiate more direct and strict action against the management of the company.

1. It is therefore recommended that the workers' union of the company should demand the recommendations made hereafter, and in the event that the management fails to comply with the same, the union should:
 - Continue with all forms of protests and demand that the management take steps to remedy the situation;
 - Make an application under Section 42 D of the Factories Act to the Government to investigate the situation at Hema Chemicals;
 - Launch unfair labour practices complaints in the Industrial Court;
 - File a contempt petition for non compliance of the order not to deduct Rs. 500/- for the Bhai Beej holiday;
 - Annex all the proof regarding Mr. Ramkailash's case and the other case of foot ulcer, alongwith all other proof petitioning various governmental authorities to investigate and implement safety measures, and file a writ petition, or and, a complaint in the National Human Rights Council. The Factories Inspector should be made a party to all the legal proceedings.
2. Wide press and media coverage should be given to the situation in Hema Chemical;
3. Industrial Hygiene Survey should be carried out by the management and take further remedial measures for healthier, safer and cleaner workplace environment.

4. Each and every worker of the Company (whether involved in hazardous processes or not), should be given a complete medical check up in relation to the history of exposure. Medical check ups should be conducted periodically and more often for the workers involved in hazardous processes. The worker and the union should be given a copy of their medical report. The Company should undertake a detailed survey of the ambient air quality within and around the factory premises of the Company and provide a copy of the same to the union.
5. The Company must review the manufacturing process and adopt a more safe manufacturing process. The Company is bound to provide all the necessary protective gear to the workmen irrespective of the expense.
6. Workers who are suffering from deep ulcers should be given compensation as per the law and a minimum additional ex- gratia amount of Rs. 2,00,000/- (Rs. Two lakhs) for pain, suffering and disability. All workers suffering from nasal septum should also be awarded an ex-gratia of Rs. 40,000/- for the suffering and exposure to risk.
7. The company should forthwith give the union a copy of the emergency plan, and details of all the measures adopted for the safety of the workmen, to the workers' union in the company.
8. The Company should set up a workers safety committee and should disclose full information regarding the exposure to hazards.
9. Failing substantial compliance, the Factory Inspector should suspend the factory license granted to the Company.
10. ESI should employ Occupational Health specialists at the ODCs. The ODC should be open for all the days of the week, should have better facilities for specific tests or it should tie up with institutions where such facilities are available. Detailed reports of the all the investigations carried out, should be given to the injured person. It should be open for any injured person to visit the ODC without any interference of his employer. The Centre should immediately employ a Specialist in Occupational Health.
11. The company should undertake a detailed survey of the ambient air quality within and around the factory premises and provide a copy of the same to the union.

Chapter 6
RIGHT TO INFORMATION

1. Vyavsayik Swasthya Suraksha Mandal [VSSM]
Through Jagdish Patel
43, Srinathdham Duplex
B/h. Dinesh Mills
VADODARA - 390 005

2. Ramkailash Saroj
C/o 101, Shree Krishna Apartment no. 2
Opp. Kothi Police Parade Ground
Raopura, Vadodara - 390 001

Petitioners

Vs.

1. Nandesari Industries Association
For their defaulter members whose names are in the petition.
GIDC, Nandesari
Dist: Vadodara

2. Vadodara Employers Organization
For their defaulter members whose names are in the petition
Federation Building
R. C. Dutt Road
Vadodara - 390 005

3. Chief Factory Inspector
Shram Bhavan, Khanpur
Ahmedabad

4. State of Gujarat
Through Secretary
Sachivalaya
Gandhinagar.

Respondents

Vyavsayik Swasthya Suraksha Mandal Petitioner No. 1 is an organization working in the field of occupational health and safety. Mr. Ramkailash Saroj, Petitioner No. 2 is a worker in a factory known as Hema Chemical Industries and an activist of the Vadodara Kamdar Union. Petitioner No. 2 contends that he is a victim of occupational disease.

Respondent No. 1 is the Nandesari Industries Association, which consists of the owners and management of several chemical-manufacturing units in Nandesari Industrial Estate; Respondent No. 2 is the Vadodara Employers Organization, which is an organization of owners of various industries in Vadodara. Respondent No. 3 is the Chief Factory Inspector statutorily required to ensure maintenance of occupational health and safety. Respondent No. 4 is the state of Gujarat.

The Petition has been filed in respect of the alleged failure of the respondents in implementing the provisions of Section 41-A to H of the Factories Act, 1948.

6.1 BACKGROUND

The VSSM and Ramkailash Saroj made a complaint against the non-compliance of the provisions relating to the right to information under the Factories Act, 1948 and under the Environmental Impact Assessment Notification, Notification No. S.O. 318(E), and S.O. 319(E) dated April 10, 1997. The complaint has listed the various provisions that have been enacted under the Factories Act in the aftermath of the Bhopal tragedy. These provisions are specifically applicable to hazardous process undertaken by factories.

It was submitted that Sections 41-A to 41-H of Chapter IV- A of the Factories Act, 1948, provide for detailed requirements concerning setting up of and running factories which involve hazardous processes. These Sections cover all the chemical industries and thus these provisions would be applicable to virtually the whole of the Golden Corridor. It was submitted that those complained against regularly flout these provisions.

The scheme of Chapter IV- A of Factories Act, requires:

1. The State Government to set up a Site Appraisal Committee to consider applications for granting permission for initial location of factories involving hazardous processes. Site Appraisal committee is to make its recommendations to the State Government.
2. The occupier of every Factory involving hazardous process is to disclose all material regarding dangers including health hazards and the measures to overcome such hazards to the workers and also general public in the vicinity.
3. At the time of registering a Factory, the Company has to formulate a detailed policy concerning health and safety of the workers and inform the authorities about this policy.
4. The Company has to also draw up, with the approval of the Chief Inspector, an onsite emergency plan and detailed disaster control measures and make these known to the workers and general public living in the vicinity.
5. The Company is to also lay down measures for the handling, usage, transportation and storage of hazardous substances inside the factory premises and the disposal of such substances outside the factory premises and publicise them among the workers and persons staying in the vicinity.
6. The Employer is required to do regular medical checkup of workers even after they leave the job and maintain up-to-date medical records.
7. Central Government is empowered to appoint an enquiry committee in case safety standards are not being met.
8. Every such factory is required to have a Safety Committee consisting of equal number of representatives of workers and management for maintaining proper health and safety standards.

Jagdish Patel appeared before the Tribunal and stated that in Gujarat most of the industries that are involved in hazardous processes are flouting section 41-B to H of the Factories Act, 1948. He further submitted that on the basis of Section 41 B of Factories Act, 1948, People's Union of Civil Liberties (PUCL), a democratic rights organisation, addressed letters¹ to 350 factories asking for information as required under that provision. Only one of these replied giving a very cursory information. Following this the PUCL filed a Public Interest Litigation² in the High Court of Gujarat. The Gujarat High Court directed the employers to give this information to PUCL but till date no such information has been provided. The Court also directed the factory inspector's office to get implemented the section 41-A to H of the Factories Act, 1948.

¹ Notice of People's Union for Civil Liberties to the factory owners, 2nd November 1996 – Annexe 6

² Public Interest Litigation by PUCL, Special Civil Application No. 2300 of 1997, Gujarat

The order³ of the High Court of Gujarat is annexed herewith at the end of the chapter as Annexure 'B'. The Tribunal was further informed that the Factory Inspectorate of Gujarat has stopped publishing annual reports since 1974.

Shri Rohit Prajapati, of PSS appeared and stated that in respect of public hearings, on the rare occasion when they do take place, reports are not made available. On one occasion, only a 12 page Gujarati excerpt of a 400 page Environment Impact Assessment Report was made available. In response to a query from a panelist doctor, he mentioned that even doctors are not provided with information concerning acute and chronic environmental hazards.

Respondents were sent advance notices of the hearing but none of them appeared before the Tribunal or sent any submission.

We were further informed that the State Government had not yet appointed a Site Appraisal Committee.

6.2 FINDINGS

6.2.1 Violation by the State Government of Section 41A:

The purpose of Section 41-A is very clear and self-explanatory but the State Government has not bothered to constitute the SITE APPRAISAL COMMITTEE.

6.2.2 Gross violation of S.41-B

- (i) The Factories Act was amended in 1987 following the Bhopal Gas tragedy. Chapter IV-A was added to the Act. However, the unfortunate part is that the State Government formulated the rules only late in the year 1995. The provisions in this chapter are for industrial units carrying out hazardous processes as defined by the Act. Sec. 41-B of the Act provides for giving information to the community about process and storage of chemicals as well as the hazards and the precautions to be taken in case of emergency. To exercise this right, the local groups had repeatedly requested the hazardous industrial units in Vapi, Ankleshwar, Nandesari and Vadodara Petrochemical Complex to provide information as per the provisions of Sec.41-B. After waiting for a considerable period, as there was no response, they approached the Factory Inspector of the respective areas and appraised them of the situation in light of the aforesaid sections, but to no avail. Since the petitioners did not receive any positive response to repeated requests, Chief Inspector of Factory, Gujarat was approached who also did not show any interest in the matter.
- (ii) Gujarat is a highly industrialised state. The last decade has seen expansion in the industrial sector at an unbelievable rate. In particular, the Chemical Industry has progressed very rapidly and as a result factories producing hazardous chemicals have come up on the Vapi-Mehsana belt in the Gujarat State. The concentration of Chemical Factories engaged in the hazardous process of manufacturing, transporting, storing and dumping of hazardous chemicals is in Ankleshwar Industrial Estate near Bharuch, Nandesari Industrial Estate near Vadodara, and in and around the city of Ahmedabad. These factories are dealing with hazardous chemicals as listed in the schedule, which is given in the Factories Rules, published by the State of Gujarat in the year 1995.

³ Order of Special Civil Application No. 2300 of 1997, Gujarat, 4th March 1998 – Annexe 9.

- (iii) With the increase in chemical industries engaged in hazardous processes, the number of health hazards has also increased, and its consequences in the form of various diseases as stipulated in the third schedule of the Act. That apart, the potentiality of a major environmental accident endangering lives of thousands of workers and general public residing in the vicinity is always hanging like a Damocles sword. The entire situation becomes even more grave in the light of the fact that the setting up of and concentration of chemical factories in these areas is not preceded by any infrastructural facilities and is done in violation of the requirements of the industrial and environmental Acts. People have come across many incidents in recent years wherein workers of the hazardous chemical factories have died in accidents and people residing in the vicinity have been affected. Moreover, workers suffering severe burn injuries due to accidents taking place in hazardous chemical factories are very common and those responsible have always gone scot-free. Besides, the Petitioners submitted that they had been receiving complaints of pollution created by the factories involved in the hazardous processes. The inaction on the part of the concerned authorities has become a regular feature.
- (iv) The object and purpose of the amendments in the Factories Act in 1987 and insertion of Sec.41-A to H and Sec. 96 was to make the Act more effective and to see that stringent conditions are imposed on the occupiers of factories involved in the hazardous process so as to avoid and/or minimise the environmental hazards. Petitioners submitted that the majority of the factories are not even aware about these provisions and nor have they received any directions regarding implementation of these Sections from the concerned officers. At the same time, some employers, though aware about the provisions and their mandatory responsibility, were not at all ready to comply with the same. When the Petitioners approached the Factory Inspectorate and talked to them in detail about the importance of the right to information, it appeared that the Factory Inspectors themselves were not clear about the provisions of the Act.
- (v) No information about the dangers involved in such processes was disclosed by the occupiers of the Factories involved in the hazardous process. This includes non-disclosure of information regarding health hazards and the measures taken to overcome such hazards arising out of exposure to or handling of the materials or substances in the manufacture, transportation, storage and other process. The information was not given to the workers employed in the factories, nor to the Chief Factory Inspector, the local authority within whose jurisdiction these factories are situated and neither to the general public in the vicinity. It should be noted that the Factories (Amendment) Act 1987 has been a total non-starter and the object and spirit behind this amendment has been frustrated. The Petitioners did not receive any response from the authorities on whom the Act has conferred mandatory responsibility to ensure that the provisions inserted by way of amendment are complied with in its true spirit by the Occupiers of the Factories involved in the hazardous process to avoid another accident like Bhopal.

When the Petitioners met with the Deputy Chief Inspector of Factories, he accepted in principle that the said provisions are required to be implemented by the Occupiers, failing which, they should be prosecuted under Sec. 96-A of the Act. But when it came to giving directions to all these factories, he started making excuses. Non-compliance of the aforesaid provisions on the part of the Occupiers of the Factories involved in the hazardous process and inaction on the part of the authorities towards directing the Occupiers and compelling them to enforce the provisions of the Act, amount to violation of Sec. 41-B to Sec.41-H and violation of Articles 14, 21, 39, 42, 43-A, 47, 48-A and 51-A of the Constitution of India. The apparent inaction on the part of the authorities inspite of the repeated oral and written reminders in the light of a grave situation wherein a major environmental accident can take place at any time amounts to total non-discharge of duties on the part of the authorities and the responsibilities for the same must be shouldered by them.

6.2.3 PUBLIC HEARING:

Due to the heavy concentration of chemical industries and the level to which the pollution problem has reached, the government has declared a procedure for Public Hearing by Notification No. S.O. 318(E), and S.O. 319(E) dated April 10, 1997. However, the unfortunate part is that the procedure is vague and does not include the right to information categorically.

The Notification reads as follows:

“ SCHEDULE-IV

[See para 3, sub-paragraph (2) of Schedule-II]

PROCEDURE OF PUBLIC HEARING

1. Process of Public Hearing: Whoever applies for environmental clearance of projects, shall submit to the concerned State Pollution Control Board twenty sets of the following documents namely: -

- An Executive summary containing the salient features of the project both in English as well as local languages.
- Form XII prescribed under Water (Prevention and Control of Pollution) Rules, 1975 where discharge of sewage, trade effluents, treatment of water in any form, is required.
- Form I prescribed under Air (Prevention and Control of Pollution) Union Territory Rules, 1983 where discharge of emissions are involved in any process, operation or industry.
- Any other information (OR) document or document which is necessary in the opinion of the Board for their final disposal of the application.

2. Notice of Public Hearing: The State Pollution Control Board shall cause a notice for environmental public hearing which shall be published in at least two newspapers circulated in the region around the project, one of which shall be in the vernacular language of the locality concerned....

3. Access to the Executive Summary: The concerned persons shall be provided access to the Executive Summary of the Project at the following places namely: -...”

Thus, under this Notification only an executive summary can be available to the affected persons. The term executive summary is not defined and thus the industries have been misusing this loophole. This notification does not provide any idea about the detailed procedure. The residents and the workers do not have any idea about what the authorities do after the public hearing and what are their rights. This procedure is therefore ineffective.

6.3 RECCOMENDATIONS:

1. The Government should implement Section 41-A of the Factories Act, 1948 within three months time.
2. The Factory Inspector's office should immediately submit the status reports concerning implementation of Sections 41-B to 41-H.
3. The Factory Inspectorate should be directed to submit it's annual reports regularly and upon failure to do so the Chief Factory Inspector should be immediately suspended.
4. The Public Hearing procedure should be spelt out in clear detail and be implemented expeditiously.
5. The State Government should be directed to supply the detailed Environmental Impact Assessment Report in the local language and in English to the concerned persons including local residents prior to undertaking or allowing any expansion.
6. No new industries or expansion of the existing industries should be permitted till all the above procedures are complied with in the given locality.

7. Residents, concerned parties and organisations should be given a right to directly approach the Courts. Presently, this right is not granted under the Factories Act and the Act needs to be amended.

CONCLUSIONS

This kind of investigation by its very nature cannot be exhaustive and only provide an overview. But even the brief interaction we had with the area and its people has led us to the conclusion that the golden corridor of Gujarat is a seminal example of how industrialists, politicians and law enforcement agencies can rape an entire area, its people, workers and environment towards purely profiteering ends.

The problems with the Golden Corridor need to be viewed in the larger perspective of industrialisation in Gujarat and India as a whole. India's rapid economic, population and industrial growth are causing severe environmental degradation and pollution problems with local, regional and global impacts. Urbanization with its concomitant expansion of vehicular transportation, industrialization, high intensity agriculture, and the growing demand for consumer goods, increase pressure for the extraction, procurement, and conversion of natural resources for energy. With a relative progress economic growth, India has simultaneously witnessed a significant deterioration in the quality of its air, water and soil.

Air quality in India's major cities indicate that ambient levels of Nox,SO₂, lead and suspended particulate matter are often higher than World Health Organization and Indian standards. Sulfur dioxide levels in nine of the country's major cities exceed national standards. Other harmful substances such as ozone are not monitored. Major contributors to air pollution problems in India include thermal power stations, Industrial factories, vehicles, and the use of non-commercial fuels such as coal briquettes, animal dung and trash by large sections of the population. The negative environmental effects from increased fossil fuel use will likely increase as India seeks to meet the energy demands of its expanding economy. Coal will play a predominant role in this expansion. The major pollutants from coal exploitation include the principal green house gases (GHGS) particulate air emissions, coal mining runoff and wastes and coal ash solid wastes which pose a large-scale disposal problem.

Most of the rivers, streams, and large stretches of the coastal marine environment in India are highly polluted with municipal waste, waste generated from industry, chemical agents from fertilizers, pesticides from crop protection, and silt from degraded catchments. In the major cities, less than 50% of the total waste water generated is collected and less than one-fourth is treated. The consequence of such pollution is high levels of waterborne diseases which account for two-thirds of all illnesses in India with a significant loss in productivity. Although there is Coastal Regulations Zone Notification designed to protect the coastal marine ecosystems, implementation is weak and marine pollution continues largely unabated.

Soils covering about 20% of the country are partially degraded from animal overgrazing, deforestation, improper irrigation practices, and poor land use patterns. In addition intensive agriculture and over-cultivation has resulted in nutrient-depleted soils. The amount of garbage generated in most India cities is increasing. Per-capita solid waste generation is estimated to be about 350 to 500 gms. Only about 60% of this waste is collected and even then it is irregular (not daily) and disposed of in ways which result in ground water and air pollution.

The situation in Gujarat is no better and if the Golden Corridor is treated as a model of industrialisation to be replicated countrywide, it is not only a scary scenario but an ideal recipe for national disaster. In the Prelude to this Report we have already discussed the Gujarat situation but the following observation from an article published in the Down To Earth by Shankar V., Martin M. Bhatt and

Erkman S., under the title “Who cares where its dumped?” in an issue of June 1994 sums up the situation well:

“Industrial estates are proliferating in Gujarat, however waste disposal has not been a priority consideration for any of them. The Ahmedabad-Vadodara-Surat industrial belt has over 2000 units in the organized sector and more than 63,000 small-scale units manufacturing chemicals like soda ash, dyes, yarns and fertilizers. Besides, the state has two other major industrial estates Ankleshwar and Vapi in the Baruch-Valsad belt.

“The Nandesari industrial estate near Vadodara is a major production centre for highly toxic chemicals like H-acid and J-acid, which are not easily biodegradable. An inventory of waste at Nandesari, done in 1993 puts the daily generation of effluents containing solid waste at 120 tones about 70% of which is from industries manufacturing dyes and their intermediates.

“Vapi in Valsad district has around 1800 units of which about 450 fall in the category of polluting industries – 50 paper mills, 60 dye intermediate producing units, 200 dye industries, 100 pharmaceutical factories, 25 textile dyeing units and about 10 pesticide plants.

Industries in all these areas usually dump their waste in low-lying areas within a 2-km radius. As a result, a major illegal dump yard has sprung up on the banks of the river Daman Ganga. The Vapi Industrial Association has allowed its members to dump waste on 0.6 km plot within the estate.

Apart from, small and medium industries which have contributed largely to disorganized hazardous waste disposal, large industries such as the Indian Petrochemicals Corp Ltd. (IPCL) at Vadodara also appear to have contributed to contamination of the ecosystem through indiscriminate disposal of hazardous waste.

IPCL, which generates waste in all of the 18 categories classified as hazardous by MOEF, dumps 1800 tones of solid waste every month at a site near Nandesari. The company’s onsite waste disposal tract is a semi-open area behind a wall, where waste from its 14 chemical units is dumped as a matter of routine. The IPCL dumpsite is on a hill. Since there is no adequate scientific treatment of the waste, they are washed down into the river contaminating the waters with hazardous wastes.

Pollutants from IPCL include organic acid, hydrocarbons, sulfides, acrylo nitrite and propylene waste. The dumpsite often catches fire in the afternoons. Chemical analysis of the dumpsite leachate shows it contains toxic levels of phenol.

Another large industry Gujarat Alkalis and Chemicals Ltd. (GACL) dumps up to 1 tone of mercury sludge, among other things, every day. The volume of mercury sludge is reported to have been much higher in the past.

As a result of all these above reported activities, land, groundwater and surface water bodies have been extensively contaminated in these industrial areas of Gujarat.”

Needless to say the workers in the chemical units are the worst casualty for they not only work in alarming conditions but they also have to stay close to the industries since they are neither capable enough to find accommodation away in the city nor have proper transport to reach their workplaces. What could best explain their condition is the fact that it took nearly 50 years of successive governments to include them under the Minimum Wages Act. The chemical industry came under the Act in May, 1997 and that too after a sustained struggle by the Unions inter alia through a Public Interest Litigation. Needless to say the wages are far lower than the rise in the cost of living.

At every place that we visited we encountered major pollution related hazards. This is affecting the lives of people not just in one or the other aspect but in every aspect namely, air, soil and drinking water. Apart from this, it has been having visible impact on the health of the residents. Workers of these companies are of course the worst affected. Though we mainly looked at the Chemical industries whatever limited look we had in respect of other industries make us to conclude that the problem is all pervasive. At most of the places there is no pollution control equipment and wherever efforts have been made to provide for control of pollution they have been half hearted and ineffective.

Environmental management is a continuous process that consists of three interconnected steps:

- a) the collection and analysis of relevant data; learning from the best worldwide practices and incorporating these in the planning, formulation and implementation of policy including the setting of standards;
- b) program implementation, monitoring results and active compliance enforcement; and
- c) periodic verification through independent auditing. An assessment of India's environmental management system suggests that weaknesses are evident at each of these three main steps and at every administrative level i.e. center, state and district (municipality and Panchayat).

In brief, environmental management capacity has to be enhanced. This will require more effective professional and technical integration of environmental concerns into policy planning formulation and implementation; changes to, and or enhancing institutional structures to strengthen monitoring, compliance and enforcement of environmental laws and standards; decentralizing center level command – and- control of environmental initiatives to the state, district and community both for local ownership and local relevance, introducing more non-traditional approaches to environmental management including an increased role for community-based non governmental organizations and a recognition that training and upgrading of staff and officials who operate the environmental management institutions and agencies is a sound investment.

Law concerning environmental pollution is one of the fastest growing branches of law in India. In the last thirty years a number of laws have been passed to check environmental degradation. Some of the more important laws are the following:

1. Water Pollution Act, 1974;
2. Air Pollution Act, 1981;
3. Environment Protection Act, 1986;
4. Indian Forest Act, 1980;
5. Notification concerning Coastal Zone Regulation,
6. Amendments to the Factories Act,
7. Hazardous Wastes (Management and Handling) Rules, 1989;
8. Public Liability Insurance Act, 1991

Legally, it is virtually impossible for any industry to start or expand without prior environmental clearance. Environmental Impact Assessment Report and Environmental Management Plans are an absolute precondition to start an industry and public hearings have become necessary for factory expansions. The law frowns upon any kind of pollution whether it is air, water or noise, it also controls dumping of hazardous wastes and does not permit ravage of coast lines or trimming the forest cover. On paper it looks as if we have won the battle against pollution.

Maybe the existing laws are not sufficient to deal with the drastic situation. But even if the existing laws are implemented in their letter and spirit, a large amount of problems can be alleviated. Besides, the Supreme Court has in recent years laid down four major principles which are to govern environmental law and even if these principles are implemented much improvement can be achieved.

- Precautionary principle;
- Polluter pays principle;
- Doctrine of public trust;
- Transgenerational equity principle.

Much of the environmental pollution is irreversible. By the time pollution is noticed and action taken, it would have already taken its toll. Bhopal is a living example of this. It is internationally well accepted that emphasis has to be on prevention of pollution rather than wait for it to take place and then adopt fire fighting measures.

Another problem which arises in pollution matters is the question of proof. At times, though it is easy to see the effects of pollution it becomes very difficult to conclusively prove that these effects are a result of the activities of a specified industry. The problem becomes more acute when a number of similar industries are operating in the same locality, for example chemical industries. Under the normal law, the person making the allegation is required to prove the allegation. Thus, if the pollution control authorities or a citizens' organisation makes an allegation that a particular industry is the cause of environmental hazards it is for the authority or the group to substantiate such an allegation. This becomes a very difficult task for the citizens because access to data, scientific analysis, etc. is very difficult. At times, even for the authorities (even assuming they act honestly and diligently), this is a difficult task because of inadequate and partial access to the plant, outdated equipment, manipulation of records by the industry and regulated emission of pollutants during site visits by the officials of the authorities.

The Precautionary Principle requires that the State Government and pollution control authorities take preventive measures for stopping pollution. According to the Supreme Court, this principle has three dimensions-

- Environmental measures- by the State Government and Statutory authorities- must anticipate, prevent and attack the causes of environmental degradation.
- Where there are threats of serious and irreversible damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- The 'onus of proof' is on the actor/ developer industrialist to show that his action is environmentally benign.

The consequence of this principle is that the State Government and pollution control authorities are required to play an active role in identifying potential pollution hazards and take preventive measures. Thus before any industry is allowed to set up its plant, the authorities are required to assess the likelihood of pollution hazards and not allow the industry to commence operations unless appropriate pollution control measures are adopted. In fact this is the principle behind the present requirement of submitting Environment Impact Assessment study and Environment Management Plan before permitting new activities. What is however needed to be done on an urgent basis is an Area Impact Assessment Study- a specific study predicting not just the isolated impact of the proposed industry on the locality but a study which would take into account the existing pollution in the area and taking into account the additional and synergetic pollution load which the proposed industry would cause. In fact this flows logically from the precautionary principle, whose very core is not the individual industry but the impact on the locality.

Polluter Pays Principle lays down that the cost of pollution, whether on the environment or on people has to be paid by the polluter. Polluter should be made to pay for the damage caused because of his activities. Thus, he should not only be made to install pollution control equipment but also pay for restoration of the environment and compensation to the victims of his activities.

Public Trust Doctrine lays down that all common resources such as rivers, forests, mangroves, air, etc. are owned by the State not for itself but in trust for all the citizens in common. Every citizen has equal access and rights to these and they cannot be misused or trampled with by either the State or by private parties to the detriment of others. The State is obliged to protect these resources.

The Transgenerational equity principle provides that formulation and implementation of environmental laws has to be based not merely on how the present environment will be affected by a given activity but also how the future generations will be affected. Whether a particular industry should be permitted to be set up or expand or not will thus depend not just on whether the industry causes any present damage to the environment but also whether it is reasonably likely to cause any damage for the future generations.

Application of all these principles and laws can go a long way in ameliorating environmental problems but to a large extent this would depend on the diligence and honesty of the authorities. Unfortunately this is presently in short supply. One of the ways of getting round this problem would be for the Supreme Court to personally penalise by fines and imprisonment not just the industrialists but also the personnel of the pollution control authorities in all cases where the authorities have failed to implement this principle by design or by negligence.

But the reality is entirely different. In every big city we can actually smell the pollution increasing, more and more complaints are coming of lands becoming infertile due to pollution, villages having to do with polluted drinking water are multiplying and forests are depleting at a faster rate than ever before. We should also not forget that the greatest industrial disaster in the world- the Bhopal tragedy occurred during this 'pollution sensitised law' era and to compound the calamity hardly any of the affected persons have received any compensation. This tragic trend is likely to increase with India's efforts at wanton liberalisation and increasing presence of multi nationals who will use India as a dumping ground for hazardous waste and manufacturing ground for products banned in their parent countries.

Like with many other branches of laws, the environmental laws in India also suffers from the dualism of being progressive on paper and ineffective in practice.

A good example of the failure of environmental laws is the Golden Corridor. The unbridled and uncontrolled expansion of industries in this area, in the midst of one of the most highly industrialised states in the country, in complete disregard of the legal provisions is clearly a shining ensample of travesty of justice.

Fish are dying by the thousands, hardly any potable water exists in the area, people are increasingly falling sick because of the pollution and the whole area is soon likely to become unlivable. This in the midst of a legal regime which the Government prides in proclaiming to be one of the most progressive in the world.

The width and depth of the pollution and the repetition of the same story every where leads us to conclude that the industrialists are least bothered about the pollution and the pollution control boards, the Factory Inspectorate and the Government are acting hand in gloves with the polluters.

The hazards of groundwater pollution are as serious and sometimes more serious then surface pollution because people dependent on wells, borewells or hand pumps have neither the information nor the means to test such water nor any other alternative.

A description of the conditions of contract labourers in their work places is also a catalogue of exploitation. An increasing number of large companies (including multinational companies) are taking labourers from labour contractors who are denied even minimum dignity in their working conditions.

The attitude of the employers and the Government authorities to this Tribunal also needs deprecation. All the concerned parties were served in advance, they were invited to hearings not only at the site but also at the common public hearing at Vadodara. However, only a select few employers and officials appeared before us. Their attitude also leaves much to be desired. If this is their response to a Tribunal consisting of multidisciplinary experts one well imagine the way they treat the woes of local population and workers.

FURTHER RECOMMENDATIONS:

Each chapter of this Report ends with specific recommendations concerning the problem at issue. We believe that these recommendations should be implemented in full throughout the Golden Corridor. Apart from those recommendations we believe that the following additional measures should be taken by the authorities:

1. Using environmental audits, independent experts and baseline and current state studies, liability of industry should be established and proper evaluation should be done of the extent of damage to the environment. This should form the basis for an interim compensation to the affected population. Such a compensation should also be for the short term as well as for the long term. The environment also has to be compensated to offset the impact on it to the maximum extent feasible. Responsibility for this should be squarely on the industry and no subsidy- direct or indirect-should be given by the government.
2. Toxic Release Inventory is a concept under implementation in various western countries where they have more and prolonged experience of regulating hazardous substances manufacture. Toxic Release Inventory (TRI) is a database of information about releases and transfers of toxic chemicals from manufacturing facilities(factories/industries).Facilities must report their releases of a toxic chemical to TRI if they fulfill certain criteria. Not all pollution is reported under TRI as it exists in the USA. However it can be appropriately adapted for India and be made more comprehensive and exhaustive say like a National Pollutant Release Inventory. One of the more important aspects is that it should be widely, publicly available and mandatory on the behalf of factory.
3. There is a proposal to design and implement Toxic Release Inventory databases in India, the current status of which is not yet known. However the database should be widely available and exhaustive. Those who do not report toxic releases under this should be appropriately fined or punitive measures taken against them to prevent such practices. In the USA, those (facilities) who fail to report as required are subject to civil penalties of upto (US)\$ 25,000 a day. There is no reason why such action cannot be taken in India.
4. Most of the industries in the Golden Corridor have been set up through the provision of major tax concessions and soft loans. Such concessions should be withdrawn for any company that is found to be polluting.
5. No company that is found to be polluting should be allowed to set up any other plant in any other part of Gujarat, and preferably in no other part of the country, unless its polluting practices are stopped.

ANNEXES

ANNEX 1

Compilation on the basis of Laboratory Report received from the Civil Engineering Department,
Faculty of Technology, M.S. University of Baroda
Our Estimate of Total Quantity of Heavy Metals in approximately 50 Lakh m.t. of Total Dump of
G.S.F.C. Ltd., Fertilisernagar, Vadodara.

Dr. K.K. Shah, c/o VADPRAN, Baroda.

Ref.: NIL

Source: Solid Waste Sample from G.S.F.C. Ltd. Chalk/Solid Waste Dump

Collected by: Dr. K.K. Shah c/o Vadpran.

Ref. No: CE/PHE/T-2257

Parameters	Heavy Metals	Max. Permissible Limit as per Hazardous Waste Act	Total Qty. [M. Tonnes]	Percentage
Arsenic				0.0
C.O.D.				3.01
Chloride				0.0
Calcium			2,43,000 MT	4.86
Cadmium	Waste Category 4	5 kg/yr.	100 MT	0.002
Copper	Waste Category 3	10 kg/yr.	35 MT	0.0007
Chromium Hexa .				0.0
Chromium Total				0.0
Cobalt	Heavy Metal Waste	0 kg/yr.	80 MT	0.0016
Fluoride			5,000 MT	0.1
Iron			15 MT	0.0003
Lead	Waste Category 3	10 kg/yr.	305 MT	0.0061
Mercury				0.0
Manganese			120 MT	0.0024
Nickel	Waste Category 3	10 kg/yr.	350 MT	0.007
T.D.S			1,57,800 MT	3.156
Phosphate			40 MT	0.0008
Sulphate			33,000 MT	0.66
Silica			2,850 MT	0.057
Zinc	Waste Category 3	10 kg/yr.	300 MT	0.006
CaCO ₃			4,80,500 MT	9.61
CaSO ₄			46,750 MT	0.935

10 % Leachate Analysis:

pH	6.0
Total Hardness	880 mg/litre

NOTE: All the results are on the dry basis of the sample. The above analysis is based on only 10 percent Leachate Analysis at 6.0 pH, which will increase as and when pH is more acidic as shown by the experiment done by NEERI, Nagpur, for By-Product Gypsum Analysis Report.

For Gypsum:

CHARACTERISTIC OF BYPRODUCT GYPSUM

CONSTITUENTS	% & for * mg/kg
Moisture	13-19
Combined Water	19
pH	3.2-3.6 i.e. (Highly Acidic)
Calcium (Ca)	22-23
Magnesium (Mg)	0.01-0.09
Sodium (Na)	0.16-0.71
Silica (SiO ₂)	1.76-3.04
Sulfate (SO ₄)	48-50
Total Phosphate (P)	0.08-1.33
Fluoride (F)	0.15-0.54
Cadmium * (Cd)	1.25-18.00
Chromium * (Cr)	1.72-8.00
Copper * (Cu)	4.00-5.11
Lead * (Pb)	3.42-176.00
Manganese * (Mn)	5.47-184
Radioactivity	29 pci/g

Reprint of:
RACHEL'S HAZARDOUS WASTE NEWS # 71

**“DECADE OLD STUDY REVEALED THE POLLUTING EFFECTS OF
LANDFILLS**

A careful study of 50 landfills in 1977 concluded that 43 out of 50 (86%) had contaminated underground water supplies beyond the boundaries of the landfill. At the other 7 sites off site contamination was measured but could not be attributed to the landfills by the strict criteria used in the study. In other words, the study of 50 landfills found groundwater pollution at all 50 sites, but the contamination could be definitely traced to the landfills in only 43 cases (86%).

The study was conducted by Geraghty and Miller of Port Washington, NY one of the nations's leading hydrology-consulting firms, under contract to EPA (U.S. Environmental Protection Agency). They looked at 122 sites in 15 states and finally selected 50 sites in 11 states for careful evaluation. They studied 7 in Wisconsin, 6 in Illinois, 5 in Indiana, 5 in Michigan, 2 in Pennsylvania, 5 in New York, 9 in New Jersey, 3 in Connecticut, 5 in Massachusetts, 2 in New Hampshire and 1 in Florida.

Criteria for selecting sites were strict: no site was selected if it was already known to be contaminated or if there were reports of bad taste or bad odors from drinking water near the site already sites were selected to be include various geologic settings (various rock and soil types) and various climatic conditions sites were selected to include different kinds of dumping (landfills and lagoons) and different kinds of wastes. Some of the wastes would be termed “hazardous” today but many of the wastes involved were not “hazardous” by today's legal definition and are still allowed in municipal landfills today. Sites had to be at least 3 years old.

The criteria for determining whether a site was contaminating groundwater were strict.

- (1) Contamination had to be measured in groundwater beyond the perimeter of the site.
- (2) The concentration of contaminants downstream of the site had to be greater than the concentration of the same contaminants measured in an uncontaminated background well.
- (3) All wells used had to be tapping the same aquifer.
- (4) Geologic interpretation of the data by hydrologists had to convince them that the landfills were the source of the contamination.

In 43 out of 50 cases the landfill was confirmed as the source of contamination. In four other cases, contamination was confirmed but the area of contamination was so great that sources besides the landfill were also suspected; at three more sites, contamination was found but data could not be gathered from uncontaminated background wells. So contamination was confirmed at all 50 sites but in 7 cases the projects criteria could not be met for deciding that the landfill was the culprit.

The term “landfill” was used to mean a dumping ground that accepted garbage, demolition debris, municipal and industrial solid wastes, sludge's or liquids. The investigation “concentrated on those landfills with a major component of industrial waste”.

Some of the landfills had liners others did not. Since publishing this study the EPA has published its opinion several times, that all landfill liners will eventually leak. (See

RHWN # 37). Thus this study provides important evidence that all landfills lined or not all eventually contaminate groundwater. Lined landfills will contaminate groundwater more slowly than unlined landfills, but the long term effects will be the same: someone's groundwater will become contaminated whenever municipal solid waste or industrial waste or legally hazardous wastes are placed in the ground.

The study makes some interesting points worth remembering about landfills: "The intermixing of inorganic and organic wastes, wastes of high and pH, and wastes having different physical properties in a common disposal area, may lead to influences on the environment not anticipated from any single waste material". This is important because landfill liners are selected to be compatible with the wastes that will be placed in a landfill. However as this statement says, the mixing of wastes in a landfill will produce unanticipated chemical combinations with unpredictable results. A landfill liner selected to withstand attack from chemicals X, Y and Z may not withstand attack from chemicals X and Z in combination or Y and Z in combination. The more chemicals involved the greater the number of possible combinations the more complex the interactions will be and the less predictable the results become.

The study makes another valuable point: "The wastes that are deposited continue to weather and 4 each for years". The chemical interactions within a landfill do not cease when the dumping stops. In the case of inorganic materials (arsenic, lead, chromium and so forth) the duration of the hazard is essentially infinite — toxic metals will never change into anything besides toxic metals. (The Geraghty and Miller study found toxic metals at 49 of the 50 sites and found they contaminated groundwater off-site at 40 out of the 50 sites.)

When anyone proposes a new landfill and says that liners are being selected to prevent contamination of the environment you should ask:

- (a) How can they possibly predict all the possible combinations of chemicals that will attack the liners?; and
- (b) What is the expected duration of the hazard inside the landfill vs. the expected duration of the liners that have been selected?

If the proponents of a landfill project are honest, these questions will force them to admit that they are not able to predict the chemicals that will come in contact with the liner (especially since the chemicals used by industry change from year to year and an average of 1000 new chemicals go into commercial use each year); and they will be forced to admit that the duration of the hazard (in the case of metals at least) is very great (thousands of years or longer) whereas the expected lifetime of any human created material (including packed clay liners and all FMLs [flexible membrane liners]) is much shorter than the expected hazard. Leakage is inevitable.

Common sense and available data combine to force a single conclusion: all landfills will eventually leak. Landfill liners may slow the release of contaminants into groundwater but they cannot prevent it. There is no such thing as a secure landfill.

The Geraghty and Miller study is *The Prevalence of Subsurface Migration of Hazardous Chemical Substances at Selected Industrial Waste Land Disposal Sites (EPA/530-SW-634)* first published by EPA in 1977; still available from National Technical Information Service [NTIS] Springfield VA 22161; phone (703) 487-4650; order No. PB 275103."

TRANSLATED IN ENGLISH FROM ORIGINAL GUJARATI DOCUMENT.

Ex. 24

Ref. (IT) Demand no.108 of 1995

Dr. Sushikumar Sunderlal Varma

Age: 48 years, Service, Vadodara.

Examination in Chief: Shri Sudhir Biniwale, Union Representative,
Vadodara Kamdar Union

I am performing my duty as Certifying Surgeon in Factory Inspector's Office since 6 years. As a part of my duty, I have to examine the workers, working in the Chemical Factory, with regard to occupational health, its effect and side effects on the workers health and the changes that take place in the body of the workers. I had often gone to Hema Chemicals to examine the workers with regard to occupational health and those workers who approached me I have examined their physical health.

While examining the workers I have generally found Hyper Acidity, Dry Dermatitis (Side effects on skin). Nasal Septum Perforation – Hole in the curtain of nose, etc. First two diseases, which I have mentioned, cannot be said to be serious. But Nasal Septum perforation can be said as a serious and a disease of permanent nature.

Vadodara Kamdar Union had sent Complaint Petition to the Factory Inspector. I had gone to the Factory site and had also examined (the workers). Before that with the co-operation of the Vadodara Kamdar Union, I had surveyed about the health problems of the workers. On the basis of that survey, I have prepared a report. I have informed the Director of the Company to send the workers of the Company for further treatment and intensive examination to occupational centre Gotri (ESIC Hospital). I will produce the report of that survey.

Further chief in examination by the Representative of Gujarat Kamdar Panchayat Shri K. T. Trivedi. The Company is mainly produces Sodium Bichromate. Over and above, it produces other chemicals, which I had examined. I have taken into consideration the effects on the body of the workers due to the temperature of Furnace (Heat Stresses). Without record, I cannot say the temperature of the furnaces. It is true that the temperature of the furnace is high. Due to that (Electrolyte Imbalance) taken place (in the workers) i.e. the change in the proportion in the body. If he remains in continuous contact of the temperature that happens. I have recommended the treatment for the peace of mind for food and medicines; cleanliness is necessary for the diseases of skin.

Cross-examination: By the Representative of the Company Advocate Shri Kiran Shah.

If worker do not take bath with soap after the duty hours, it is possible that the disease will further increase. For the treatment of nose the Company should keep-provide "barrier hem" which I had not found. Sodium Bichromate was also kept there. If hands and feet are washed with it the possibility of ulcer is negligible.

Cross-examination adjourned on request.

Dt.

27.3.98

Sd.

Illegible,

Member, I.T.

The witness was present for cross-examination. Again Affidavit for cross-examination.

Company's representative Advocate Shri Kiran Shah does not want to cross-examine the witness.

No re-examination.

Sd.
Illegible.
Member I.T
Dt. 17.4.'98.

Editorial in The Indian Express
July 15, 1998

**“The invisible people
Those who are forgotten from birth to death**

A recent report in this paper describes the utterly inhuman responses of an employer and the Gujarat government machinery to the continuous exposure of workers to hazardous chemicals. To the proprietor of Hema Chemicals, conditions in his unventilated factory outside Vadodara are no worse than what is produced by vehicular pollution on Indian roads. Judging by its performance, the Factory Inspectorate agrees. Emission levels within the factory have not been measured even though the Inspectorate's own medical officer certified an incriminatingly high incidence of cases of nasal septum perforations and dermatitis after examining some of the factory's 250 workers. The workers themselves report gangrene and lung and kidney ailments as well. The normal response in such a situation would be to shut down the factory until the working environment was brought into conformity with legal standards. But who is going to do that? Government agencies are not made accountable to anyone. Proprietors will remain indifferent as long as regulations are not enforced and unions are ineffective. So, as long as there are more poor, illiterate people outside the factory gates looking for jobs, those inside will be treated as expendable, as a subhuman species for whom no one need take responsibility.

It has taken the cyclone disaster at Kandla to prove just how invisible Indian workers can be to state agencies. Even one month later, no one knows for certain how many people, mostly migrants from UP and Bihar, lived in the Shirwa labour camp and worked in the salt-pans, or how many died in the tidal wave. The Gujarat government's total figure is 1000 dead but unofficial estimates are ten times higher. Many of those cremated on the beach have no names. Neither the bureaucracy nor salt-pan owners maintained records. If survivors want to claim compensation for their lost relatives, they have to prove their lost relatives, they have to prove their identities from the ashes and bones on the beach. According to a new study, more than half the children born in India are not registered at birth. In UP, Bihar and Rajasthan as few as 20 percent is registered. One can follow their movement from there to migrant camps in more enterprising states where they continue to remain invisible to those who employ them and those required to regulate their workplaces and living conditions. At every conceivable point where the state can intervene to give these people a chance for a better life, there is abysmal failure. The backward states are falling behind on every count from education and health care to the welfare of women and children. Prosperity in states like Gujarat is not accompanied by a greater concern for those at the bottom of the ladder who tend more and more to be people from outside the state. The eternal question is why a country with great technical, organisational and financial resources is unable to cope with rudimentary issue of giving its poorest people a decent life. As always, the answer is that the fault lies with a political class which is second to none in its callousness, hypocrisy and obsession with power.”

PEOPLE'S UNION FOR CIVIL LIBERTIES

81, Sahayog Apartment,
Mayur Vihar 1, DELHI - 110 091
Founder : JAYPRAKASH NARAYAN
Advisor : V. M. TARKUNDE
President : K. G. KANNABIRAN
General Secretary : Y. P. CHHIBBAR

PUCL
C/O Shishu Milap
1, Shri Hari Apartment,
Behind express Hotel,
Alkapuri, BARODA

Date: 2nd November 1996.

To,
The Director/Partner/Proprieter/Manager

The People's Union For Civil Liberties [PUCL] is a voluntary human rights and civil liberties organization founded by late Shri JAYPRAKASH NARAYAN and Justice V. M. TARKUNDE and presently headed by supreme court lawyer and leading human rights activist Mr. K. G. KANNABIRAN.

Since PUCL recieved number of complaints from the community residing around industrial area about ill health allegedly due to industrial pollutants. It has also been noticed in recent years that number of serious accidents take place in industries posing serious injury and environmental hazard to the community and public institutions around. The PUCL has set up a COMMITTEE to go into this matter. A section 41-B of the Factories Act provide for disseminating various process & environmental hazards to the community.

We therefore, request you to furnish us following information at the earliest :

- [1] List of all the chemicals handled by you.
- [2] Type of processes and operations carried out in your industry.
- [3] Storage details for important raw materials, intermediates & finished products.
- [4] Probable health & safety hazards posed on the workers & community as visualized by you.
- [5] Action taken by you for monitoring and controlling these hazards.
- [6] Existing facilities for disposal of chemical wastes.
- [7] Your future plan in the direction of the better environmnet.

Please note that after receiving the information, the PUCL expert committee would suggest steps needed to be taken, if any.

We are sure that you will agree with such an intervention by the PUCL for a pollution free society. Expecting your full co-operation and quick reply from your side within a Week.

Your sincerely,

(ZIYA PATHAN)
PRESIDENT
BHARUCH.

(TULSI BODA)
PRESIDENT
Baroda.

PEOPLE'S UNION FOR CIVIL LIBERTIES (PUCL)

C/o Shishu Milap
1, Shri Hari Apartments
Behind Express Hotel, Alakapuri, BARODA

Date: 1st February, 1997

To,
The Factory Inspector
Bharuch.

Sub : Regarding Implementation of the 41-B of the Factories Act 1948.

Respected Sir,

The People's Union For Civil Liberties [PUCL] is a voluntary human rights and civil liberty's organization founded by late Shri JAYPRAKASH NARAYAN and Justice V. M. TARKUNDE and presently headed by supreme court lawyer and leading human rights activist Mr. K. G. KANNABIRAN.

Since PUCL received number of complaints from the community living around Ankleshwar industrial area about ill health allegedly due to industrial pollutants. It has also been noticed in recent years that numbers of serious accidents take place in industries posing serious injury and environmental hazard to the community and public institutions around. The PUCL has set up a EXPERT COMMITTEE to go into this matter. A section 41-B of the Factories Act provide for disseminating information regarding various processes & environmental hazards to the workers and the community. A letter, demanding the basic information about the industry's product, its impact on the environment and health of the workers and community nearby, was sends to most of the hazardous industries attached with the letter but some of the industries refused to take the letter after reading it. The letter accepted by the industries is attached with the letter but till today there is no response from the industries.

We came to your office number of time and once meet Factory Inspector Mr. D. G. Panchmiya but we were told that in presence of Factory Inspector Mr. R. M. Gosai discussion can take place. After number of reminder to your office we are sending you this letter. The copy of the letter that was sends to the industries, was given to your office. Then also we are sending you the copy of the letter with this letter.

We want quick action from your office to proceed with the matter of non-implementation of the 41-B of the Factory Act 1948 and take action against the industries under section 96-A of the Factory Act 1948. Kindly also supply us the list of the industries registered as hazardous in the Ankleshwar area.

If you will not do needful regarding most serious urgent matter within 10 days than we will be force to go for legal action against you and industries both together.

We are hopping quick positive response from your office.

Your Sincerely

ROHIT PRAJAPATI
Coordinator of the Committee

Copy to

The Chief Factory Inspector
Ahmedabad

With a request to quick further follow up.

PEOPLE'S UNION FOR CIVIL LIBERTIES

PUCL
c/o SARDAR BHAVAN,
Behind Jubalibaug,
Baroda.
Phone / Fax No. c/o 0265 - 412499

Date: 21st July 1998.

MOST URGENT

To,

Shri A. V. Dhimar
THE DEPUTY CHIEF FACTORY INSPECTOR
KUBER BHUVAN,
VADODARA.

Shri B. P. PARMAR
THE FACTORY INSPECTOR
KUBER BHUVAN,
VADODARA.

Shri R. M. GOSAI
THE FACTORY INSPECTOR
BHARUCH.

SUB: With reference to our letter dated 23rd July 1998 and then after your Barod office letter dated 4/15/23-4-98 and no letter form your Bharuch Office. Our meeting with Baroda office on 4-5-98.

Respected Sir,

It looks like that your office is not accountable for even High Court Order with reference our Public Interest Litigation Sp. C. A. no. 2300/1997. We are talking to your office time to time but there is no specific reply to our letter dated 23rd July, 98. The Bharuch office had not replied our letter at all.

When we had the meeting with your official on 4-5-98, we were told that you would write to us about our letter in detail in a week. This was decided because you were not prepared to reply our questions by saying that be practical and all most all industry are implementing 41-B, C, E, F, G, & H of the Factory Act, 1948 and we can not provide you these details as they are secrets of our office. We are very disturb with your reply "Go wherever you want to go? Who are you to advise us about our duty?".

We do not understand why you are not prepared to provide us the information. What is secret in it? Why you are not replying our letter? Even about complain against the GSFC's, your office told us that they are implementing it since long but when we asked you about the information you found out some excuse in the name that we will reply your letter. The meeting and your no response to our letter indicates that you are not serious about the implementation of the High Court order. This amounts to Contempt of the court. This is our last and final letter to you with reference to High Court order. Now we will be forces to go for contempt of the court against you.

For this subject please kindly do corespondent at the following address.

Rohit Prajapati
PUCL, 101, Shree Krishna Apt. no. 2, Opp. Kothi Police Parade Ground, Raopura, Baroda – 390 001
Rohit Prajapati, Coordinator of the committee

In the High Court of Gujarat at Ahmedabad

Special Civil Application No: 2300 of 1997

1. People's Union for Civil Liberties
Rohit Prajapati
Shishu Milap,
1, Shri Hari Apartment,
Alkapuri, Vadodara
Petitioners

Vs.

1. State of Gujarat
Chief Secretary,
Sachivalya,
Gandhinagar.
2. Commissioner of Industries
Block No. 1 and 2,
GH – IV, Sector 11,
Gandhinagar.
3. Chief Factory Inspector
Shram Bhavan,
Khanpur,
Ahmedabad.
4. The President,
Ankleshwar Industries Association,
K1/205, GIDC Estate.
Ankleshwar.
Respondents

CORAM: The Chief Justice Mr. K. Sreedharan and Justice A.R. Dave

Date of Decision: 04/03/98.

C.A.V. Judgement (Per A.R.Dave)

Service of rule is waived by Learned Government Solicitor Shri D.A. Bambhania for respondents Nos. 1 to 3 and Learned Advocate Shri Kamal Trivedi for respondent No. 4. With consent of the learned advocates, the petition is finally heard today.

2. By way of Public Interest Litigation, the petitioner – People's Union for Civil Liberties has approached this Court with a grievance that the provisions of Sections 41B, 41 C, 41 E, and 41 G of the Factories Act, 1948 (hereinafter referred to as 'the Act') are not being enforced by the respondent Government Authorities. 3. Leading Advocate Shri Girish Patel appearing for the petitioner has submitted that number of factories manufacturing chemicals and involved in hazardous processes have been set up in industrial area of Ankleshwar and Nandesari in Districts Bharuch

and Vadodara respectively. It has been submitted by Shri Patel that as said factories involved in hazardous processes are a menace to not only workers of the factories but they also adversely affect environment and health of persons living in the vicinity. He has submitted that so as to see that there is a strict supervision of the government authorities on the factories having hazardous processes, Chapter IV-A has been included in the Act in 1987. By virtue of insertion of the said chapter, sections 41-A to 41-H have been enacted with a view to seeing that information referred to hereinabove, the respondent government authorities can have a vigilant eye over hazardous processes and can also ensure safety measures in the factories involving hazardous processes.

4. It has been submitted by Shri Patel that though the said provisions were enacted in 1987, the respondent authorities concerned with enforcement of the said provisions have not acted properly and, therefore, they should be directed to enforce provisions of sections 41 B, 41 C, 41 E, 41 F, and 41 G of the Act. It has also been prayed that if the said provisions are violated by any of the factories, the respondent authorities should take appropriate action under provisions of sec. 96A of the Act so that the purpose with which the said sections have been enacted can duly be achieved.
5. In pursuance of notice issued by this court, Id. Government Solicitor Shri Bambhanja has appeared for respondents Nos. 1, 2 and 3 and has placed on record a report of the Chief Inspector of Factories, Gujarat State, respondent No. 3 herein. It has been submitted by Id. Govt. Solicitor Shri Bambhanja that, in fact, the respondent government authorities have already taken appropriate action for enforcement of the sections referred to hereinabove. He has also placed on record names of factories involved in hazardous processes set up in industrial areas of Nandesari and Ankleshwar. The said report reveals that officers functioning under respondent No. 3 have already taken appropriate actions for enforcement of provisions of the sections referred to hereinabove. It has also been submitted by Id. Govt. Solicitor Shri Bambhanja that in fact factory inspectors had visited several factories involving hazardous processes and appropriate legal actions have been initiated against occupiers of factories who were found to be not complying with provisions of sections 41B, 41C or 41G of the Act. So as to substantiate his submissions, he has placed on record a list giving names of 22 defaulting factories situated in Nandesari which were inspected during May, June and July 1997. Appropriate legal actions are being initiated against the occupiers of the said factories. It has also been submitted by Shri Bambhanja that due efforts are being made by respondent No. 3 and his subordinate officers to see that the provisions of the sections referred to hereinabove are being enforced and legal actions are also being initiated against factories which are not strictly complying with the provisions of the said sections. He has, therefore, submitted that as the respondent authorities have already taken appropriate actions, the petition deserves to be rejected. 6. On the other hand, Id. Advocate Shri Girish Patel has submitted that actions taken by office of respondent No. 3 are not adequate and they had become active only after filing of the present petition. It has also been submitted by him that several representations made to respondent

No. 3 or his officers were not looked into by the said officers and appropriate steps had not been taken care for non-compliance of the sections referred to hereinabove.

7. After hearing the Id. Advocates and upon perusal of the report submitted by respondent No. 3, we are prima facie satisfied that actions have been taken by respondent No. 3 to see that the provisions of section 41 B, 41 C, 41 E and 41 G are enforced. We, however, feel that still office of respondent No. 3 should become more effective and should take appropriate action against all defaulting factories. It has been suggested by Id. Advocate Shri Girish Patel appearing for the petitioner that there are certain factories which are still not complying with the provisions of sections 41B, 41C, 41E, 41F and 41G of the Act and therefore, respondent No.3 should be more vigilant in performance of his duties.
8. Though we note at this stage that respondent No. 3 and his office has taken action for enforcement of the sections referred to hereinabove, but, if any non-compliance of any of the sections referred to hereinabove by any of the occupiers has escaped his attention and if such a fact is brought to his notice by the petitioner, we are sure that respondent No.3 shall take appropriate action to see that provisions of sections 41B, 41C, 41E, 41F and 41G are strictly enforced so as to see that the purpose with which the said sections have been enacted is duly fulfilled.
9. In the circumstances, we direct that if the petitioner draws attention of respondent No. 3 to any violation of provisions of sections 41 B, 41C, 41E, 41F or 41G, respondent No. 3 shall look into the allegations or averments made by the petitioner in that behalf and shall take appropriate action after causing necessary inquiry within a period of 3 months from the date of receipt of such an intimation by him. He shall also inform the petitioner about the actions taken by him in pursuance of the information given by the petitioner.
10. In view of the above direction given to respondent No. 3, the petition is disposed of accordingly. Rule is made absolute to the above extent with no order as to costs.

(K. Sreedharan, C.J.)

(A.R. Dave, J)