Over the past few years there have been many changes in the workplaces, composition and flow of labour force. On one hand, the external pressures of demand-supply and rising manufacturing costs in the parent country have compelled the companies to develop into MNC's, and on the other hand, domestic compulsions of economic stagnation have forced the countries to integrate into global economic system. Today, the man-made national boundaries have no relevance with capital, technology, skills and products transcending across the continents.

The domestic compulsion of a manufacturing cost includes providing healthy and safe working conditions, better wages for the labour force and keeping itself in the right side of the law. The trend which started with the shifting of American companies to Latin American countries is now dominant with companies spreading its manufacturing base across globe. India and China being self-sufficient countries for industrialisation with availability of raw material, cheap labour and market, are the favourite play grounds for Japan, America, Korea, Taiwan and other industrially advanced countries. The psychological barrier in the economic theory of comparing the importance of agriculture, manufacturing and service industry and anticipating their existence only in isolation is also on the verge of breaking. In such a scenario, the designing of product still remains in the domain of the developed countries and developing countries are only used as production base. On the other hand the governments and domestic companies suffering from myopic view of such advantages are undertaking steps to welcome these MNCs. The concepts like Export Processing Zones (EPZ's) and Industrial Parks (IP's) are promoted by providing economic and social advantages.

But in the last few years the ground behavior of some MNCs in relation to labour relations, economic and environmental dealings have raised the concern of citizens' groups globally. As in the case of India, unclear and non-implementable laws, absence of right to information and protection of
trade secrets have made society in general and workers in particular captive of such companies. The publicly expressed inability by the implementing departments has further deteriorated the situation. In such a situation of information mistrust, all the stakeholders are looking for the way out.

The ILO Tri-partite Declaration of Principles concerning Multi-national enterprises and Social Policies (Article 37), says, “Multi-national enterprises should maintain the highest standards of safety and health, in conformity with national requirements, bearing in mind their relevant experience within the enterprise as a whole, including any knowledge of special hazards”. There are rational and genuine MNCs who do definitely look for genuine participation rather than ornamental participation as far as Occupational and Environmental Health and Safety is concerned. Although the number is few but their success will definitely influence the overall behavior of other MNCs and large Indian companies. Following the international guidelines and easy access to information through information technology revolution, there is a demand and tendency to sharpen the national legislations and social exceptions. Time and again in the various developments in legislations and social movements, the management is explicitly made responsible for environmental and occupational health and safety.

The best and rational solution for any visionary MNC, will be to handle this issue at two levels. Every MNC must have its corporate level policy and standards to maintain and communicate at global level and practical implementation and appliance of laws should be done with the national units. Such approach will give scope to utilise the local resources keeping in mind the cultural diversity and national requirements. The safety and environmental audits, and training of staff should be guided by global corporate policy and implemented by the local unit after modifying it. Until such modus-operandi is not made and practiced, the survival of MNC’s will be always challenged by the local and global citizens groups.

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Occupational Medicine at the Mercy of Doctors

Dr. Murlidhar V

Occupational medicine has multiple dimensions attached to it which include the political structures within the industry, the state and the workers union; the socio-economic condition and the literacy level of the workers. This article has sought to highlight the extent to which the doctors throw a spanner in the progressive movement combating occupational health concerns in India. The article has categorised the occupational health concerns and role of doctors based on cases referred to voluntary organizations in Mumbai and Ahmedabad [e.g. The Occupational Health and Safety Center (OHSC), Mumbai].

Occupational Health Concerns

A few cases of workers which we came across in the past would help in highlighting some of the growing health concerns.

- Misdiagnosis

The case of Sampat Tapare of Maharashtra is a typical case of misdiagnosis. He is suffering from Byssinosis and is the first person to get compensation for the same in Maharashtra. Though he had persistent symptoms for the past 15 years, he was misdiagnosed by the doctors at the ESIS hospital as an asthma and bronchitis case.1

The second case is of Ronald who is the first compensated case of Occupational Noise Induced Hearing Loss in India. Before coming to OHSC, for two years, doctors shunted him around, ridiculed him and got angry with him. His illness was not taken seriously and the doctors made a mockery of his problem saying, "He must have suffered injury due to a firecracker." They even referred him to a psychiatrist.2

- Lack of Information

Suresh (name changed on purpose) developed impotence due to pelvic fracture sustained due to work. The doctors who were treating him did not have the slightest clue as to how much compensation he should get based on the percentage disability.

- Ignorance

In a case of R.G. Kusher, he was suffering from Radiation injury due to his work as a helper in the industrial radiography department of X-ray Engineering limited. Because of the injury he acquired vascular disease. The doctors however were not able to assess his disability as they did not have any previous experience of handling such a case.3

In the area of treatment of Occupational diseases, there is no difference from the problems faced by people for health care in general. The union government has decreased the percentage of funds for health from 3.8% of the GDP to 1.9% in the last 15 years. This does not mean that we are spending less on health, only that 80% of the expenditure is in the unregulated private sector. Also pharmaceutical companies by advertisement and bribing doctors create a market. Having an insurance policy or a deal with the management regarding health expenses, does not prevent your body from being violated like unnecessary removal of appendix, uterus and spine surgery, or excessive medication like combined treatment for malaria and typhoid, which is a common diagnosis for any fever, which is usually viral. The middle class, unorganised workers and poor workers suffer equally at the hands of the corrupt health care system which thrives in the sickness of people.

1 Shabnam Minwalla, Textile Worker Wins Landmark Medical Damages Case, The Times of India, Mumbai: April 9, 1995.
X-ray. These doctored reports will only help the general practitioners to collect 50% commission from pathologists, radiologists and consultants. The patient unorganised as he is, rarely complains against the system as per the Consumer Protection Act (CPA).

The expenses for the above is partly covered by insurance schemes or health care deals with the management. Depending on the policies, there is always a limit to the money reimbursed. Some deals have a ceiling on OPD treatment and some on the type of the hospital which he can visit. He is allowed to go to the 'flats turned nursing homes', but not to Hinduja hospital, a five star hospital in Bombay (assuming that there is a possibility of ethical treatment at Hinduja). Similarly if he develops liver disease (jaundice) caused due to virus transmitted by unnecessary injections given by private practitioners, no insurance policy would reimburse for treatment of liver transplant in UK.

There are no treatment centers for burns or major industrial accidents occurring daily in factories situated hundreds of miles from Mumbai, because such centers are not financially viable for the private sector.

**Categories of Doctors dealing with Occupational Health Diseases**

**Factory doctors**

There are hundreds of factory doctors with diplomas in industrial health from the Central Labour Institute (CLI). The fact that they have been basically employed by the management to skilfully, not diagnose any occupational disease is understandable, but what is remarkable is the amount of money made by them. They get contracts to give Hepatitis B vaccine to chemical workers (unindicated) in thousands; similarly they do mass audiogram without checking bone conduction, which is a must to diagnose hearing loss and in case they find an abnormality they do not inform the workers. However their findings are used for presenting in conferences.

**ESI doctors**

Special Occupational disease centers in the four metropolises have been opened with a lot of fanfare in the ESI hospitals. The Mumbai center which caters to Maharashtra, Goa and Gujarat is grossly understaffed and lacking in support structures like a library, secretarial staff etc. It has no specialised equipments like audiometers etc. The ESI class II doctors working in the hospitals are usually new recruits on contract basis of three months and due to prevailing conditions are a demoralised lot.

On the other hand, ESI panel doctors make money by getting a fixed clientele due to their attachment and also earn a handsome amount from the ESI based on the number of workers treated. The workers do not like to go to them, as the attitude of doctors towards these workers is downright rude usually, since the amount of money made is limited. The ESI Class II doctors working in the hospitals are usually new recruits on contract basis for 3 months and are a demoralised lot, waiting to jump into private practice, which many cannot take to initially.

**Discussion**

The reasons for ignorance of doctors are many. One is sociological in nature, i.e., generally, physicians have little first hand experience of manual work in mines, factories, workshops or farms. Another reason is that students are basically taught that most diseases are caused by some organisms and as a doctor his role is to try to remove them. The formal training of doctors includes very less space for teaching the occupational determinants of a disease and to ascertain the relationship of a disease with a person's socio-economic and working conditions. There is hardly any time devoted in medical colleges on Occupational Health. They are only 2-3 lectures during the Preventive and Social Medicine (PSM) posting in the second year. PSM is not considered a lucrative field to be working in as compared to other disciplines of medical sciences. In a universal hierarchy among doctors, it is generally taken as a specialty by people lowest in the merit, the surgeons, being at the top and those of basic sciences at the bottom. In the recent past, due to tremendous amount of money pouring in the NGO sector in environmental health, the PSM jobs are becoming lucrative as a career, albeit to become an epidemiologist.

There are three institutes offering diploma in Occupational Medicine. The Central Labour Institute, Mumbai has a three month course and the National Institute of Occupational Health (NIOH), Ahmedabad and the

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1. P. Anantram; *Journal of Medical Ethics (Bombay)* Vol. 1, No.3:4
2. Marudhir V; *Journal of Medical Ethics (Bombay)* Vol. 1, No. 3
4. **Cullen MR, Rosenstock L; The challenge of teaching Occupational and Environmental Medicine in Internal Medicine Residencies; Arch Intern Med., 1998, 148:2401-4**
Annamalai University, Tamil Nadu offer a one year course. There is no postgraduate teaching department or a MD course in any of the 250 odd medical colleges in India. The failure for this can be attributed to the present system of the medical councils. Before a university sanctions a new degree (say in occupational medicine), the criteria is that the department and the OPD should have been functioning in a teaching hospital for at least 2-3 years. The funds for the same come from the hospital’s budget. The university gives sanction for new degree courses in medical colleges and conduct examinations. The respective state medical councils (an elected body, IMC) recognises these degrees in the state and the National Council then sends an inspection team to assess the feasibility of recognising the degree at the medical level. Though the medical councils have two statutory functions viz. medical education and medical ethics in practice, they rarely have taken suo moto initiative in starting new courses. They have basically encouraged and recognised private (capitation) medical colleges which has received prior sanction for respective universities. Given this scenario, it appears that a degree course in Occupational Health seems a long way off, but atleast an OPD can be started with local doctors initiative.

The Epidemiologist

Multitude of studies are being done by epidemiologists in the government and the NGO sector involving thousands of workers related to their health and safety. But none usually reach the worker. They are presented in conferences. The doctors say that, as epidemiologists they are concerned with the macro-level situation, and the duty of informing the worker of the illness is with the concerned authorities. They rarely inform the worker of his disease even on humanitarian basis. The dehumanised nature of today’s jobs and the increasing alienation makes the doctors insensitive.

Court appearance of doctors

Most of the occupational diseases are not notified by doctors though it is mandatory as per law. During conversations, hesitation to make court appearance has come up as a reason for the same. But in practice the doctor may be called as special witness at later stages of Workmen’s Compensation cases as per the wishes of the judge. Usually the judge accepts the doctors comments on the case. Also a doctor has anyway been going to the courts when he was attached to medical colleges in medico-legal cases as part of his duty, therefore the court is nothing new to him. Hence this is just an excuse for not reporting occupational disease.

Not taking Occupational history

The need for taking proper occupational history was emphasised more than two centuries ago by Bernardino Ramazzani (1633-1714), an Italian physician. In India Occupational history is rarely taken (the space next to ‘occupational’ in the indoor papers in major hospitals is usually left blank). Hence Byssinosis is mistaken for tuberculosis if the occupation is not noted carefully. Another example of missed occupational etiology is that of occupational asthma, if the physician fails to take occupational history.

Future Actions

Many editorial column have appealed to the medical profession to recognise the occupational causes of disease to prevent their recurrence and their future prevention, somewhat like the utopian socialists of nineteenth century in Europe. Such appeals are not likely to work. However interventions aimed at educating the people of their health problems and rights would prove more productive in combating this problem. Collective movements on these lines of thoughts would be an added measure to further the issue of Occupational Health in India.

Till then we have to depend on the few ethical doctors in both the private and especially the public sector to further the issue of occupational health in India. Hence it is necessary to educate oneself on aspects of the human body, as well as certain practices of medicine and to know how to use the health care system (both private and public) in order to prevent physical damage to oneself and also in order to save money (e.g. wasteful activities like injections and tonics)

Short courses could be organised by unions as being thought by the Indian Overseas Bank Employees (IOBE) union. One of the unions in Mumbai named ‘Shramik’ has taken the initiative and conducted a paramedical course of three months for the students community. At later stage unions could think of having control on the treatment itself through it’s own panel of doctors and pathology laboratories, protecting their members from unscrupulous private practitioners which could provide consultation/second opinions and clean pathology reports.

*Author is a member of COEH team in PRIA*

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Hazardous Power Plants of Gujarat
J.B. Patel

Introduction
Electricity is synonymous to light. It is equated with development as without it, industry, agriculture and all sorts of production would come to a standstill. In Gujarat, the Gujarat Electricity Board (GEB) is the biggest producer of electricity. In the years 1995-1996, its installed capacity was 4325 KV per hour out of which 3729 KV was that of the thermal power plants.

The following is a brief report of a study conducted in some power plants in different parts of Gujarat to assess the health and safety conditions prevalent there. The study was conducted by Society for Participatory Research in Asia (PRIA) in collaboration with the People’s Training & Research Centre (PTRC), Vadodara.

Employees of the GEB
It is estimated that there are more than 3 lakh workers in India engaged in the generation and distribution of electricity. GEB employees number about 50,000 out of which 30,000 are in production while approximately 20,000 are in distribution. In plants owned by companies other than the GEB, contract and casual labourers add up to 40,000-50,000 workers.

Departments in a Power Plant
The various departments in a thermal power plant can be classified as Boiler, Turbine, Electric, Coal yard or fuel handling, Coal yard maintenance, Boiler maintenance, Turbine maintenance, Dispensary, General workshop and instrumentation, Laboratory, Housekeeping, Administration, Watch and ward (Security), and Canteen.

Welfare facilities for the workers
There are hardly any welfare facilities for the workers. For example, there are no washing facilities, cold drinking water, lunch room or crèche. The management has provided all these facilities but these are quite far away from the place. It was not possible for the workers to make use of the facilities provided.

Work in night shifts
At times, the work continues even during the night. They have to work in complete darkness during the night shifts. There is no arrangement for artificial illumination for the workers in the power plant.

General Hazards in a Power Plant
Coal Dust
Coal dust is seen in large amounts in the work environment. As per the provision of the Factories Act, 1948, the average exposure to coal dust should not exceed 10 mg/m³. This is known as the Threshold Limit Value (TLV). In many of the areas in the power house, the amount of coal dust is several times the TLV. The dust enters the respiratory tract of those exposed. Ultimately some dust settles down in the alveoli of the lungs. Alveoli with coal dust can not perform their function. Oxygen intake of the body decreases. A worker who has been exposed to coal dust for a long period of time may contract pneumoconiosis. Coal miners’ pneumoconiosis can be diagnosed by X-ray. If the dust exposure continues, the disease turns into progressive massive fibrosis. In some cases along with pneumoconiosis the patient has symptoms of rheumatoid arthritis. This is known as Caplan syndrome.

Coal Ash
Coal ash is the remnant of coal after it is burnt. It contains silica, calcium, silicate, magnesium, aluminium, iron etc. Ash formed due to burning of oil contains vanadium pentoxide and other oxides of vanadium. Use of high sulphur content oil causes emission of sulphur oxide. Air in the turbine and boiler may contain coal dust with carbon monoxide. The workers in the boiler room suffer from conjunctivitis following exposure to vanadium compounds and sulphur dioxide. Workers handling coal ash may suffer chronic bronchitis, rhinitis, and degenerative changes in the long run. Elements like nickel, vanadium and others present in coal ash are responsible...
for skin trouble caused when moist skin is exposed to coal ash.

Coal ash and cinders may retain their heat for a long time. Exposure to these causes serious burns or scalds. Some of the studies suggest that coal ash may cause asthma.

Insulation

To prevent heat losses, the tubes and pipes are covered with an insulating material. Asbestos is most popular among various insulating materials. The fibres present a serious hazard to workers' health. They reach the lungs through inhalation. They may cause asbestosis, cancer of the lungs or mesothelioma, a rare cancer. Now, mineral glass wool and other man-made fibres are used in lieu of asbestos. Although these materials do not present as serious a health risk as asbestos, many of them cause lung problems on inhalation. Moreover, man-made fibres cause skin and eye problems.

Heat

At a number of locations in power plants, workers are required to work in elevated temperatures. High temperature can be tolerated only for a brief period of time. Exposure to very high temperatures produce severe discomfort or unbearable pain in the exposed skin surfaces or may affect normal respiration. High humidity along with air temperatures above about 50°C produce severe discomfort in the oral, nasal and oesophageal passages. Transitory polycythemia may also occur during work in over-heated premises. Skin disorders due to heat range from prickly heat to skin cancer. Psychoneurotic disorders due to heat include acute distress in which sudden and dramatic loss of emotional control is observed in exposed workers.

Heat stroke, heat exhaustion and heat cramps are three other effects of heat. Working in a hot environment results in an increased number of errors, slower work rate and lack of continuity at work which may result from minor accidents, sickness and labour turnover. High temperature may cause acute cardiac attacks.

Noise

Different types of pumps, compressors, bowl mills, blowers, ID fans, FD fans, crushers, turbines, tipplers, dosers etc. are the sources of noise in power plants. Working in excessive noise affects the hearing capacity as well as other body functions. Noise-induced deafness is a very slow process. The individual becomes a victim unknowingly. The gradual progress of the disease has four distinct phases.

Hazards of painters

Painters may have to work at heights for which suitable scaffolds or ladders should be used. Falling from heights is very common and results in serious bodily injury. A large amount of dust is generated during the removal of old paint. Chemicals are used to remove old paint, before repainting. A number of solvents are used as additives in paints. The names and hazards of all solvents being used must be known. Skin disorders caused due to exposure to solvents are compensable diseases. Some benzene compounds which are also used as paint removers, may cause blood disorders. Lead is a constituent of metal primers known as red-oxide, while wood primers contain toxic chemicals. Some paints contain toxic pesticides.

Welding - Cutting

Various types of welding-cutting jobs are carried out daily in power plants. Fire is one of the risks during these jobs. For gas welding, acetylene, LPG, hydrogen etc. are used as fuel. Acetylene may cause explosions if present in air in the range of 2 to 80% and if lit by a spark. Ultra-violet radiations are emitted in large amounts during electric arc welding. Painful conjunctivitis known as “eye flash” is caused due to direct exposure to arc flash even for a moment.

During welding-cutting considerable amounts of fumes are generated. Gases like carbon dioxide, carbon monoxide, nitrogen dioxide, ozone, times, are emitted.

Chromium fumes generated during stainless steel welding, may cause nose and lung cancer. Long-term exposure to nickel, chromium and iron oxide can cause pneumoconiosis. Fluoride in flux may cause nose bleeds while nickel oxide poses the hazard of lung cancer.

Foundry

A small foundry is a part of the general workshop of a power plant. Pattern core, sand moulding, casting, furnace, finishing are different divisions of the foundry. Metals are melted at high temperatures in the furnace. Carbon monoxide generated from the cupola is a toxic gas which is colourless and odourless. The molten metal gives out infrared and ultraviolet radiation. Long-term exposure to infrared radiation may cause cataract, which is a compensable disease. Ultraviolet rays emitted from the furnace may also cause a wide range of skin prob-
lems from dermatitis to cancer. Foundry workers may suffer from skin problems like dermatitis following exposure to heat, acids, solvents, calcium oxide, resin, binder etc. Graphite dust may cause pneumoconiosis. A chemical called cresol may cause blindness if it comes in contact with the eyes. If the skin comes in contact with cresol, it causes deep burns and even gangrene. The clothes should be changed immediately and medical treatment should be sought.

Accidents

As per our information in 1997, 70 reportable accidents were registered at Ukai thermal power plant and it lost 635 man-days in the year. Majority of the injuries were burns and bone damage. In most cases, cognisance of accidents involving permanent employees only is taken for official data. The number of accidents involving contract/ causal workers is quite high. They lack education and training, are less experienced and by virtue of being non-permanent employees, are required to perform more hazardous duties, are paid less, have longer working hours, shorter breaks, lack protective equipment and are entitled to lesser holidays. Thus it is this group of people who are usually the victims of industrial accidents. These are not recorded in the official data. Because they are unorganised they get poor treatment and little or no compensation.

Risk of electrocution

Carbon brushes at the end of DC generators need to be changed frequently. This is carried out when the generator is in operation making it a high-risk job. The safe way is to stop the generator while changing the brushes. But that affects production, which is not affordable, hence this high risk is taken.

Repairs in electrical panels are taken up by the electrical maintenance department. Repairing panels is in itself a hazardous work. Short circuit may result in flashes. Workers often sustain burns in such incidents.

Conclusion

From this report, it is obvious that work in a power plant entails a lot of risk at every step. To ensure greater safety in working conditions it is important to have effective safety departments which would carry out regular monitoring of the work situation. While systematic study of the working conditions have been done by the National Institute of Occupational Health and the Central Labour Institute, none of their recommendations have been implemented in the power plants.

In the last 15-20 years some organisations have been established in different parts of India, to generate awareness about safety and health. All these organisations believe that the workplace should be safe and healthy, accidents and resultant injuries should be reduced, legal provisions for health and safety should be implemented, the laws should be updated from time to time and their scope should be widened, just compensation should be paid to the victims of occupational accidents and diseases, research in the field of occupational health and safety should be continued and the central or state governments should make good budgetary allocation to tackle the issue.

All these organisations are active within their limitations. These organisations work independently with trade unions and workers. As a result of these efforts, the level of awareness is increasing, slow progress is seen in implementation of the law and a few workers have received compensation for the occupational diseases they suffer from.

Author is the director of PTRC, Baroda
Victims of Development
Deteriorating state of Lote industrial area

The Konkan region of western India is endowed with a rich natural resource background, in terms of rainfall, soil fertility, lush forest cover, a sea coast and abundant water bodies like rivers and creeks. Along with easy accessibility, all these factors have contributed towards attracting various industries to the region. Among these, chemicals factories are perhaps the most abundant.

As a tool for accelerating development in the Konkan region, the state government of Maharashtra has actively endorsed the influx and growth of industries. Yet, with the onset of rapid industrialisation, the local people have had very little to gain. Not only have they been victims of unfair land acquisition policies, but only a very small percentage of these people have actually found employment in the factories. Those who have, suffer the consequences of bad working conditions in the mostly chemical industries. Pollution-related health effects are evident in those employed by the industries and the non-working local populations alike. Large-scale contamination of the water, soil and air have disturbed the natural ecology of the region and traditional means of livelihood like fishing, farming and cattle-raising have been totally disrupted. With the Maharashtra Industrial Development Corporation continuing to expand its interests in the area, there seems to be no signs of a let-up in the situation.

In 1987, Parivartan Jan Vikas Prakalp started working in the Lote Industrial Area, mainly on issues related to environmental pollution and the concomitant health impacts faced by the local people. In collaboration with FRIA, Parivartan conducted a survey of this pollution-affected region. The following is a brief report on the findings of this study.

Objective of the study
To assess the extent of damage done by pollution in the following areas:
- Public health
- Agriculture
- Livestock
- Fisheries
- Fruit cultivation

Area covered by the study
The study involved 5 clusters, which are at varying distances away from the factories. The purpose was to highlight the differences in the prevalent conditions among the clusters and to co-relate them with the presence of chemical contaminants in the local environment. The clusters chosen were Dhangerwadi, Chaklewadi, Baitwadi, Deowlwadi and a fishing community in Kotwali village.

Methodology
The means of conducting this study was through family surveys, group discussions, questionnaires, personal interviews and through scientific tests to assess the level of pollution.

General information
The general information about this area which pertains to the study relate to the proximity of the areas covered to the chemical factories, number of families covered under the survey, land-ownership patterns before and after industrialisation and the availability of employment for the local people in the factories built in the region.

Effect of Chemical Industries on Health
Health problems of industrial workers
Workers in Lote Industrial Area work under extremely hazardous conditions. Most of them handle chemical substances, coming in close contact with various hazardous liquids and fumes. Since a majority of the workers are contract or casual labourers, they hardly have any protection in case of injury or accident. At their workplace, they are unprotected against any accident, as most of them are not given any protective equipment. Due to this they are prone to many health-related problems.
Health problems of local populations

Besides the workers who are directly handling the hazardous chemicals, the people living around Lote Industrial Area are also affected by the air and water pollution caused by chemical industries. The specific health problems faced by the people living in the area are respiratory diseases, skin diseases, eye disorders and stomach ailments.

The four villages surveyed revealed different trends. Lote village being closer to the industrial belt had more cases of pollution-related diseases, whereas, in Satvin village, which is farthest, the occurrence of diseases is least. This situation, supports the fact that, the occurrence of diseases is mainly due to air and water pollution caused by the industries.

Lung Function Test

A lung function test in the affected villages was conducted during December 1997. The objective was to know the extent of the effects of air pollution. The tests showed that more people living in Chaklewadi and Dhangerwadi settlements (which are in the vicinity of industrial units), suffered from lung problems. In Deolwadi and Baitwadi clusters (which are in Satvin and Asgani villages), the number of people suffering from lung diseases was comparatively less. Deolwadi is farthest (more than 7 km away) from the industries.

Effect of Chemicals on Agricultural Products

Rice and millet are the main agricultural crops in Lote, Asgani, Satvin and the surrounding villages. Most of the families are dependent on agriculture. The agricultural area in these villages has decreased due to various reasons. While the land acquisition policy of the government has seen a lot of agricultural land being sacrificed to support the establishment of factories, agricultural production itself has come down in the region, probably because the land, water and air have been rendered contaminated by industrial chemicals.

| Percentage of people with health problems (age group 18-45) |
|-------------|----------|----------|----------|----------|
|            | Lote     | Asgani   | Satvin   | Kotwali  |
| General    | 63%      | 58%      | 25%      | 27%      |
| Respiratory Disorders | 45%      | 18%      | 10%      | 18%      |

Frequent health problems

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Effect of Chemicals on Livestock

Before the advent of the chemical industries, the local people used to keep cows, buffaloes, bulls etc. in large numbers for agricultural and domestic purposes. With the availability of vast expanses of pasture land, they did not face any problem of fodder supply. But chemical contamination in recent times has taken a toll on raising livestock. Not only have the pasture lands been polluted, but chemicals present in the drinking water used by the cattle, have adversely affected cattle breeding in these villages. This, in turn has hit the livelihood of the people adversely. Many families have stopped keeping even the most essential cattle like cows and buffaloes.

Effect of Chemicals on Fruit Production

Until a few years ago, this area was well-known for its production of Alphonse mangoes, cashew nut and other varieties of fruit. The study shows that in the villages Lote and Asgani, the production of these fruits has decreased considerably during the last 5 years. According to the native people from these villages, air and water pollution caused by the chemical industries are the only possible reasons for this.

Effect of Chemicals on Fisheries

A study of the fishing settlement near Dabhali bay suggests a gradual decrease in fish production taking place over the past 5 years. The effluents and the waste from these industrial units are thrown into the rivers and nullahs. The resulting water pollution has caused not only health problems for the fishermen community, but has also threatened their livelihood, as the fish catch has reduced considerably. While large-scale death of fish in the bay waters was noticed during 1996-97, today, there is hardly any fish in these waters. When, rarely, fish are found, the local people prefer not to eat them, as they
feel these are contaminated. Earlier, a common fisherman family used to earn between Rs. 2500-3000 per month from fishing in the bay, but today their income through fishing is totally gone.

As a result, many of the traditional fishermen are compelled to work in factories as contract labourers and undertake other unskilled jobs.

Water and soil test

In Dabhol creek, three samples of water and one sample of soil were taken. The analyses of these samples showed that the Dabhol creek water was polluted mainly by the following chemicals:

- Phenolic compounds
- Arsenic
- Copper
- Chromium
- Free chlorine

Phenol is acidic in nature. The permissible limit of phenolic compound in discharge effluent is 5-50 ppm. It was found that the samples contained phenolic compounds well above this limit. In one sample, it was as high as 130 ppm and in other two, 60 and 90 ppm respectively.

As in the case of phenolic compounds, free chlorine and arsenic were also found to be way above the prescribed limits.

Further Information based on Group Discussions

Group discussions were held with people living in different clusters and the following information was collected:

1. The water sources (river, well, nallah) of Songoon, Lote, Awashi, Dhanerkunt, Kotwali and Asgani villages have become polluted and contaminated. The water smells badly of chemicals and its colour has changed.

2. Maharashtra Industrial Development Corporation (MIDC) has made arrangements for water supply, for which people have to pay taxes. Earlier, they were using natural water.

3. Cattle have died in large numbers after drinking polluted water.

4. The aquatic life in the creek is almost finished. Even frogs are not seen during the rainy seasons.

5. During the nights, the factories emit poisonous gases. The air is so polluted, that it becomes difficult to breathe near the factory area. People living in the vicinity suffer from giddiness, vomiting and headache.

6. Due to environmental changes, human health, agricultural production, fishery and fruit production are suffering.

Recommendations and Conclusion

It is obvious, that the situation demands that immediate measures be taken for its amelioration. The following recommendations are suggested:

- Make a detailed report on the chemicals used and health problems suffered by workers who use such chemicals.
- Organise workshops for the workers so that they understand the hazards they are faced with and also come to know what must be done in case of any spillage or accident.
- Organise workshops for the managers of factories and industries, so that they can impart some training to their employees, regarding safety measures in the workplace.
- The situation seems to be conducive for conducting Public Hearings. This would provide a common platform for all the stakeholders to come together and voice their concerns and opinions.

The Lote Industrial Area has seen rapid industrialisation in the past few decades. While the industries have had a lot to gain from this region, the local people have lost out heavily. The aim of any development programme should be to support the long-term needs of local resource-dependent communities. In that sense, the Maharashtra Industrial Development Corporation has failed in its attempt to bring about development in the Konkan area. With an influx of industries, people who have no stake in the area, nor any civic responsibility have wielded their influence over those whose land and livelihood they have willfully destroyed. It is now imperative to bring into focus the welfare of the local people, who have so far, been silent sufferers, whose land has been taken away, to whom promises of employment have not been honoured, who suffer the consequences of chemical poisoning of their land, air and water and who, down the years, have lost the right to control the course of action of their own lives.
A hair-raising eco hazard

India

The human hair wholesale market at Jwalapuri in north-west Delhi, India has become a major environmental hazard. Tones of human hair are burnt here every week spewing out toxic fumes, which residents of the adjoining colonies are forced to inhale.

Every day, garbage pickers go from one barber shop to another in the city collecting freshly cut human hair. Dozens of trucks loaded with human hair come everyday. The hair is brought here to be cleaned, a process done entirely by hand. The hair industry employs about 1,000 women who sift through the hair removing pieces of paper and other impurities. They get paid 30 paisa per kilogram of hair cleaned. They work roughly nine hours every day and earn about Rs. 1,200 a month.

The hair once cleaned is repacked and sent to Mumbai. From there it is dispatched to South East Asian countries where it is used for various purposes, including lining of jackets, chemical extraction of keratin and natural pigments and for making cosmetic brushes.

Every evening, hair too small to be of any use is collected and burnt releasing toxic fumes into the air. According to Dr. Iqbal Malik of Vatavarvan, an NGO, 'The keratin in the hair is made of amide and carboxyl group of proteins. When burnt, pungent-smelling gases like ammonia, nitrogen oxides, sulphur dioxide and hydrogen sulphide are released. Also released into the air is phosphene, a highly toxic gas, which was used in chemical weapons during World War II. Hair which had been cosmetically treated, like permed or dyed, before chopping releases lead compounds too. These gases may cause various effects, from mild skin irritation and watery eyes to asthma, suffocation and severe allergic reactions. The lead released may damage vital organs.'

The Hindustan Times, New Delhi, May 6, 1998

Alcohol solution for air pollution

Brazil

Business and government officials have welcomed the results of tests which indicate that air pollution in Brazilian urban areas can be reduced by adding hydrated alcohol made from sugar to diesel fuel. The tests found a 22 percent decrease in carbon monoxide emissions when 10 percent hydrated alcohol was added to diesel fuel. The mixture also yields a 35 percent reduction in particles and a 10 percent reduction in hydrocarbons. These environmental advantages are offset by a 1.7 percent increase in the cost of fuel and a 4 percent increase in fuel consumption.

The industry and government are interested in Brazil using alcohol because the country currently produces a surplus of 1,800 million litres per year, a phenomenon which brings down the prices of alcohol and sugar, both derived from the same raw material.

Indian Express, Chandigarh, June 11, 1998

Sacred cloaks to fend off loggers

Thailand

Environmental activists fighting to protect threatened forests are sometimes referred to as 'tree-huggers', after the Indian women who adopted the tactic in the Himalayas. In Thailand, Buddhist nature-lovers are going one better - ordaining the woods and dressing them in saffron robes. Local people believe that anyone who dares cut a robed tree will be cursed. An area of 225,000 trees over 240 hectares has been targeted in the Pan district of Chiang Rai in Northern Thailand. There are enough people to garland only 2,000 trees, but the heads of nearby villages take responsibility for ensuring that the exercise will continue under the authority of the local forestry officer. Such ceremonies are being organised as part of a religious tree-protection movement that is spreading across Thailand from the North.

News Times, Hyderabad, May 11, 1998
Brain link found

United States

Researchers at the National Institute for Occupational Safety and Health have confirmed the link between certain occupations and the incidence of neurological diseases.

The study says the use of solvents may play a major role in linking some of the occupations where there were more neurological diseases. Workers using solvents were in the top 10 occupations linked with neurological disease. The group includes machinery cleaners, painters, photographic machine operators etc. The NIOSH study involved the examination of death certificates from 27 states during the 1982-1991 period. The group then isolated certificates that showed the deceased had suffered from, but not necessarily died from, Parkinson's, Alzheimer's, presenile dementia or motor neuron diseases such as Lou Gehrig's disease. Researchers then identified and tallied the occupation of those suffering with the neurological diseases.

In addition to solvent users, other top 10 occupations were machine operators, machinists, scientists, teachers, medical personnel, writers, designers, entertainers and support and clerical workers.

Worker's Health International Newsletter, July-December, 1997

Miscarriages up with stress and hours

United States

The risk of miscarriage may increase three fold in stressful jobs with long hours, according to a research study of 600 female lawyers in the United States.

Researchers from the University of California questioned the lawyers, who graduated between 1969 and 1985, about their health and lives. They found a clear link between long hours in the office and miscarriage in the first three months of pregnancy.

Those who worked more than 45 hours a week were three times as likely to have suffered a miscarriage than those who worked fewer than 35 hours. Those women working longer hours were five times more likely to be under stress. The findings follow research published earlier this year which showed that pregnant women who worked full time in high stress jobs were 40 percent more likely to give birth prematurely.

Hazards 59, UK, July-September, 1997

119 industrial disasters after Bhopal tragedy

India

Notwithstanding the various regulatory mechanisms evolved by the Government agencies, industrial disasters continue to take a massive toll of human lives. As many as 119 industrial disasters took place after the Bhopal tragedy, killing over 3,000 people across the country.

The main industrial disasters are listed in the table.

<table>
<thead>
<tr>
<th>Place</th>
<th>Year</th>
<th>Cause</th>
<th>Deaths</th>
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</thead>
<tbody>
<tr>
<td>Kalyan (Maharashtra)</td>
<td>1993</td>
<td>Sulphuric Acid</td>
<td>1,123</td>
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<tr>
<td>Ujjain</td>
<td>1989</td>
<td>Chlorine leakage</td>
<td>820</td>
</tr>
<tr>
<td>Bhainda (Punjab)</td>
<td>1989</td>
<td>Ammonia leakage</td>
<td>500</td>
</tr>
<tr>
<td>Britannia Chowk (New Delhi)</td>
<td>1989</td>
<td>Chlorine leakage</td>
<td>200</td>
</tr>
<tr>
<td>Gola Cokaranath (Uttar Pradesh)</td>
<td>1990</td>
<td>Toxic Fumes Leakage</td>
<td>200</td>
</tr>
<tr>
<td>Jamshedpur</td>
<td>1988</td>
<td>Sulphur dioxide leakage</td>
<td>183</td>
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<tr>
<td>Bhopal</td>
<td>1991</td>
<td>LPG leakage</td>
<td>180</td>
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<tr>
<td>Pune</td>
<td>1987</td>
<td>Oleum leakage</td>
<td>174</td>
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<tr>
<td>Chembur</td>
<td>1985</td>
<td>Chlorine leakage</td>
<td>149</td>
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<tr>
<td>Thane</td>
<td>1985</td>
<td>Chlorine leakage</td>
<td>141</td>
</tr>
</tbody>
</table>

Source: Ministry of Environment and Forests, Government of India
Observer, New Delhi, India, March 9, 1998
RESOURCES

Books

Environmental Pollution and Control, fourth edition
This book is suitable for students and others who seek information on environmental damage, without having to deal extensively with technical terms and complex scientific data. It takes into account the environmental effects due to increasing population, fewer alternatives to waste disposal, the economic cost of preservation and the political implications of environmental issues. The topics covered are pollution and environmental ethics, various aspects of water and air pollution, wastewater treatment, solid waste disposal, resource recycling, hazardous waste, radioactive waste, noise pollution, environmental impact and economic assessment etc. The book also has a chapter on environmental and socio-economic impact assessment.

Authors: J. Jeffrey Pierce, Ruth F. Weiner, P. Aarne Vesilind
Publisher: Butterworth-Heinemann

Gender and Working Conditions in the European Union
Over the past decades, the activity rates for women has increased all over Europe. Yet, they face problems in the workplace to get the same status as men. In 1991 and 1996, the Foundation carried out statistical surveys on working conditions in all member countries. Based on the findings of these surveys, this report has been made. It deals with gender differences in the workplace and discusses them in the light of the ongoing debate on equal opportunities. It is intended for policy-makers to gain a better understanding of the problems to be overcome in order to promote gender sensitive workplaces.

Author: Dr. Kaisa Kauppinen and Irja Kandolin (Finnish Institute of Occupational Health) for the European Foundation for the Improvement of Living and Working Conditions, Dublin, Ireland
Price: ECU 30

The Employment of People with Disabilities in Small & Medium-sized Enterprises
While 12% of the European Union population suffers from disabilities, a very low proportion of these individuals finds employment in the labour force. This is true even for small and medium-sized enterprises, which otherwise have a high potential for employment creation. This report is aimed to find out how and why small and medium-sized enterprises recruit and employ people with disabilities, and how such people could have better access to employment in such enterprises. It also considers the process by which an employer identifies a need to employ someone or a person with a disability seeks employment and a contractual relationship is established and maintained. The data are based on case studies from six member states - France, Germany, Ireland, Netherlands, Spain and the United Kingdom.

Author: Morgan Carpenter (Nexus Research Co-operative, Dublin) for the European Foundation for the Improvement of Living Conditions, Dublin, Ireland
Price: ECU 16

Metalworkers and Working Time in the World
This is a report based on work timing, an issue which has different degrees of priority on unions’ bargaining agenda throughout the world. Among the topics covered are the different cultural and social structures that determine the approach and organisation of working time, overtime, the development of part-time work, the development of working time by regions, reduction of working time and how working time determines the quality of life. The book also includes tables and graphs on issues like annual working hours in selected countries, part-time work in the metal industry, overtime work in Asia, working time in the metal industry of Asian countries etc.

Author: International Metalworkers’ Federation, Geneva, Switzerland

Price: ECU 30
CIS

CIS 97-1475 Managing health and Safety – An open learning workbook for managers and trainers
The workbook provides guidance for managers on the planning & implementation of improved health and safety management. Divided in five main sections the topics covered are: need for health and safety; review of existing policies; planning for improvement; implementation of improvements; monitoring and reviewing the effectiveness of health and safety and management processes.

CIS 97-1483 Vibration solutions – Practical ways to reduce the risk of hand-arm vibration injury
The booklet provides case studies of how industries have reduced the risk of hand-arm vibration injury based on three types of control measures: reduction of exposure, maintaining blood circulation and health surveillance. Also included is checklist for readers on assessing potential problems and information on control techniques.

CIS 97-1502 Protection, In - The Workplace
Topics include review of Personal Protective Equipment (PPE); clothing for work in the cold; protective gloves; international approach to chemical safety; dangerous chemicals.

CIS 97-1544 Women at Work
The article presents a synopsis of relevant issues for working women with emphasis on British situation. Topics include medical advances and their potential effects on women; analyses of specific work conditions; physical, psychiatric and psychological problems; hazards at work during pregnancy; exposure to computer display screens, chemicals and infections.

CIS 97-1751 Gender differences in work and well-being: Effects of exposure and vulnerability
The article presents findings of 993 Canadian employees to assess the differential exposure and vulnerability of men and women to job stressors. Results indicated that women are more vulnerable than men to the effects of perceived job demands and to the degree of routinization in the job.

Kindly contact PRIA for details of above CIS Publications.

Dear Readers,

The Occupational & Environment Health Bulletin comes with a new look from this issue. The changes have been incorporated based on the suggestions of readers received during the self-evaluation exercise done last year. We thank all the readers who took the efforts to help us re-design the bulletin and make it more reader-oriented.

The changes are made in the cover page, contents layout, and the editorial team.

Contents: The two articles i.e. Theme Article and Study Report will be presenting abridged version of the study in simple language from this issue onwards. Readers interested in knowing more about the study can contact PRIA for the same. The View Point comes with a new name “Perspective”. Some of the suggestions received from the readers were that the bulletin should cover the latest developments in this field. So we have merged the National News and International News to a new section titled “Trends & Events”. The CIS section will carry brief description of some selected publications. Details of those can be availed from PRIA.

Editorial Team: Changes have also been made in the editorial team of the bulletin. From this issue onwards the editorial team will comprise of Vijay Kanhu, Dr. Muralidhar V, Sanjeev Pandita and Dr. Archana Dhar. The Editor will be Sunandha Sharma and I will remain the Executive Editor.

We would like to thank you for your ongoing support and appreciation of the bulletin and look forward to more suggestions and feedback.

Harsh Jaiti
Executive Editor
PRIA

The Society for Participatory Research in Asia (PRIA) is an independent, non-profit, non-government organisation registered under the Society Registration Act 1860.

Over the last fifteen years PRIA has promoted people-centered development initiatives within the perspective of participatory research. As the cherished mission, PRIA endeavors to promote people-centered, holistic and comprehensive evolution of society characterised by Freedom, Justice, Equity and Sustainability, by

* creating opportunities of sharing, analysing and learning among formations of the Civil Society (in particular, people's organisation and NGOs);

* engaging in independent and critical analysis of societal trends and issues, development policies and programmes; and

* enabling dialogue across diverse perspectives, sectors and institutions.

The focal aim of PRIA's Centre for Occupational and Environmental Health is to promote and contribute towards making work and living place healthier and safer. On one hand the Centre collects information from networks, organisations and individuals through research studies, documentation and data bases and on the other, it disseminates information through bulletin, publications, training/workshops and information service.

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Sexual Harassment at Workplace

Women workers suffer from innumerable problems at workplace affecting their physical, biological and mental state. While the harm done to their physical and biological self can be measured and ascertained, there is one aspect of their work life that rarely comes out in open. A dark side of the picture that is seldom talked and never rebuked is the sexual harassment which women suffer from their male colleagues. Sexual harassment is perhaps the most common, yet the most pervasive form of sexual violence faced by women at the workplace in all occupations all over the world.

Sexual harassment can range from 'harmless' banter causing mental anguish and go on to violent act of rape. Women rarely speak out against the abuse they might have faced, nor stand up to defend other women like themselves out of fear, shame and the ever-threatening consequences at work. Sexual harassment takes a psychological toll on women, and moreover when in the context of the workplace, violates one's freedom and personal dignity. Women have a right to work in a healthy environment, free from discrimination. Sexual harassment at workplace is an unequal and discriminatory form of behaviour.

The various dimension of this problem remains in all ranks of women workers though the intensity may differ in different strata. Status and authority of an officer do practically very little to ensure her dignity as a woman. Women work with the constant fear of possible harassment. Though the statistical data may not reveal an alarming percentage of women who are harassed, the truth is that there is a deficit of data on the issue. Cases of sexual harassment at any level or any form are rarely reported making it difficult to collect and analyse information. The social set-up within which we operate causes the woman to feel ashamed as she is blamed for the sexual harassment she faces. Taking recourse to any punishment immediately becomes difficult because issues of the woman's morality are raised. Sexual harassment, rife but hidden, coming on top of the frustrations of a society in transition can only be regarded as deplorable.

Recognising that each such incident is a violation of basic human rights, the Supreme Court of India, on 13 August 1997, passed a landmark judgement providing guidelines to prevent sexual harassment of women at the workplace. The judgement is an outcome of a writ petition filed by women activists and organisations following a case of gang-rape of a development worker in Rajasthan. Until necessary legislation is passed the guidelines are legally binding and enforceable. These guidelines make it binding for all government and private sector organisations, hospitals, universities, the unorganised sector to institute certain conduct rules and preventive measures to stop sexual harassment. It
stipulates a complaints committee headed by a woman, and of which half the members are women, should be deputed to look into the complaints of sexual harassment.

Through this judgement, we are assured that at least initial steps have been taken by the legal machinery of this country where before almost nothing existed except Section 509, 354, 375 and 376 of the Indian Penal Code. While under these sections the entire responsibility was on the judiciary to give justice, the new judgement places the onus of providing a safe and conducive working environment for women with the employer.

It certainly is a welcome step by the judiciary though the famous age old concern remains - will it be applicable to the real context. In our society where majority of the women workers are in the unorganised sector, toiling away to earn a day's wage and their very existence is dependent on the conditions laid down by the employer, will it not be a bit naive to think that women would come out and voice their problems. Sexual harassment is as grave a problem as compared to other issues like wages, accidents and injuries, leave, etc., yet it cannot be addressed because of the social stigma attached to it. While problems of wages etc., when raised by women pose a threat to their jobs, can we be assured that they would have the courage and means to come out and lodge a complaint of sexual misconduct against the employer or their supervisor. Studies have shown that the supervisors and employers have exploited women to a great deal in various occupations in both the organised and the unorganised sector.

How do the contract workers or the home-based workers fit within this purview of the Supreme Court guidelines? Where is the mechanism that would ensure that a committee can be formed for these workers as given in the guidelines. These women who are probably still ignorant that the Supreme Court has tried to come to its rescue, have little to rejoice as they know that this judgement too would just go into the law books for academics to boast that India has one of the most egalitarian legal documents in existence.

Until we aim at spreading more awareness on this issue and creating an environment for women to speak-up about the discrimination that they have been suffering for decades, no laws can do anything. The legal approach has to move from the 'protectionist' approach towards women and try to develop more 'enabling' laws for them. As all other labour laws were evolved after the state felt that workers needed to be protected through the judiciary, even these guidelines are an outcome of the rising problem all over. These laws were amended after they were brought into extensive use and through their use the lacunae became visible. Similarly we need to spread more awareness about these guidelines to put them to maximum use so that the application of these guidelines can be ascertained and then used for amendments or developing new Acts.

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The Bulletin

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You are welcome to reproduce any material from the Bulletin with proper acknowledgement and send us a copy.

Contributions

The editors welcome contributions, which should be typed, double spaced, on one side of the paper only. Two copies should be sent. Illustrations (B/W or colour prints or transparencies, line drawings, tables, etc.) should be included where appropriate.

Queries

The Readers are welcome to send their queries on the various issues of occupational, environmental and consumer health. The selected letters will be printed with replies. If they are not printed, answers will be sent by post. Please address your questions to the editor.

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Workers - Know Your Rights!

*Vijay Kanhere

The increasing rise in the incidence of health problems caused due to work and injuries/accidents at the workplace, demands for more awareness and detailed information on this issue. It has become imperative that each worker should know about his/her rights, the available laws and the means to avail these rights. In this article, an attempt is made to explain the existing Acts for workers in a simple manner. We will carry out this article in two issues of our bulletin. This issue will focus on the Factories Act, 1948. The objective of this exercise is to bring out those aspects of laws that are unknown to us and therefore we are not able to use them for our benefit. Many a time our ignorance of some aspects of an Act leads us to condemn it without actually analysing it closely for our benefit. The analysis is focused around the issue of Occupational & Environmental Health as laid down in different Acts.

The Factories Act, 1948

Who is a worker?

It is a common understanding as well as practice to consider only a permanent worker as the legal beneficiary in the Factories Act, 1948. For instance, a welder who is a skilled and permanent worker is provided with a protective equipment which includes lead aprons and radiation badge. A helper to the welder who is on contract is not provided with a protective gear. Is it right to judge from the situation that radiation rays do not affect contract workers? Many unionists too, while referring to the Factories Act (1948) and its violations, usually refer only to the permanent workers. Do Acts, such as the Factories Act, 1948 differentiate between temporary, contract and permanent workers?

Section 2 (l) of the Act is 2(l) 'worker' means a person [employed, directly or by or through any agency (including a contractor) with or without the knowledge of the principle employer, whether for remuneration or not], in any manufacturing process or in cleaning any part of the machinery or premises used for manufacturing process or any other kind of work incidental to or connected with the manufacturing process or the subject of the manufacturing process (but does not include members of the armed forces).

The above definition is explicit and does not allow any defense by an employer that “as a Director of Company, I was not aware this injured worker was employed by a contractor”. Similarly the nature of work is also fully described by the definition - manufacturing process or cleaning of machines or even premises or any work incidental to manufacturing or incidental to the subject of manufacturing. Sweepers, maintenance workers either permanent or contract are workers under the Factories Act.

The words 'for remuneration or not' are also very important. Many a times contract workers are not given any pay slips. Payments may be done by vouchers, that are in the custody of the employer. Workers do not have any documentary proof that they received wages. Some migrant workers actually do not get wages. They are paid advances in their village.

The Factories Act says it does not matter if you do not have proof of wages, what is important is that you should be able to show that you have worked in or are incidental to the manufacturing process. This may be feasible with statements of permanent workers or the actual observation of the Inspector.

What is a factory?

The factory is defined in the same Act in Section 2 (m) as 'factory' means any premises 'including precincts there of wherein ten or more workers are working or were working on any day of the preceding twelve months and in any part of which a manufacturing process is being carried out with aid of power or is ordinarily so carried.

Or in brief, where in twenty or more workers are working or were working on any day of the preceding twelve months and power is not used in manufacturing.
Significance: If on any single day, ten or more workers (including contract, etc.) are working (with power) it is a factory or if twenty or more are employed on any single day in manual manufacturing. We know of many places where on record it is shown that only nine workers are working but many contract workers are employed and the employer gets out of the ambit of Factories Act. This is a misconception as clarified above. The union or workers only have to show that on a single day required number of workers worked and they can avail of all rights under the Factories Act. Not only the workers but even the citizens around hazardous factories can use their rights.

When it comes to ‘rights’ as per the above Act, rights regarding overtime, hours of work in a week and a day are quite well known. Rights regarding occupational and environmental health and safety are however not well known.

**Well known limitations of the Factories Act, 1948**

a) This act is more violated than implemented,

b) Factory Inspectors are in-efficient, do not have enough number of inspectors or enough number of honest inspectors,

c) Workers or unions can approach the inspectors but cannot enforce the Act by approaching the courts directly. If the inspector does not take any action or takes some wrong action against any complaint lodged, under such circumstances, this law offers no remedy.

d) A remedial measure may include filing of writ petition in high court against such ‘Factory Inspector’ and high court may even direct the Inspector to work as per law, but this whole affair is a costly option.

Yes, the above limitations are truly limiting the use of the Act, but within these limitations or limited framework too there is scope for action. This scope as far as we have observed is not fully exhausted.

**Right to Know**

The ‘right to know’, is a rare right in India provided under this Act. As per the Right to Know under the Factories Act, 1948 Section 111-A (added in 1987), every worker shall have the right to:

i. Obtain from the occupier, information relating to workers’ health and safety at work.

ii. Get training within the factory or get himself sponsored by the occupier at a training centre or institute duly approved by Chief Inspector, where training is imparted for workers’ health and safety at work.

iii. Represent to the Inspector directly or through his representative in the matter of inadequate provision for protection of his health and safety in the factory.

This is a right enjoyed by all workers in all the factories under the Act. Even though the process may not be recorded as a hazardous process, still workers have rights as given in Section III-A. This section also gives right to the representatives of workers (or unions) to approach the Inspector on behalf of workers.

As in other Acts, such as Beedi and Cigar Workers (conditions of employment) Act 1966, the Mines Act, 1952 and the Factories Act, 1948 also provide for proper ventilation, healthy workplace and so on. What we are looking now is the general responsibility on all occupiers to take care, provided under Section 7A(1) and 7A(2) under the Factories Act. 7A (2)-C also speaks about provision of information.

As per this Act, the section describing the ‘general duties of occupiers’ is important because other sections dealing with details of machine guarding or dust may miss out on certain circumstances. Section 7A (1), (2) is designed to ascribe general duties of providing/ensuring health and safety and welfare of all workers when they are at work in the factory. [Please note - it says all workers and not only permanent workers].

7A-C : The provision of such information, instruction, training and supervision as are necessary to ensure the health and safety of all workers at work.

If the process is hazardous, the Act gives further rights, specially added after Bhopal tragedy. The list of industries involving hazardous process is given in Schedule - I of the Act. We will concentrate on the rights of workers and citizens regarding hazardous processes. To have a better idea we will briefly list industries given in Schedule - I of the Act.


Chapter IV-A deals with hazardous processes. Section 41-B is titled Compulsory Disclosure of information by the Occupier.

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1 Kindly refer Schedule I for the complete list
41-B i) The occupier of every factory involving a hazardous process shall disclose in the manner prescribed, all information regarding dangers including health hazards and the measures to overcome such hazards arising from the exposure to or handling materials or substance in manufacture, transportation, storage and other process to the workers employed in the factory, the Inspector, the local authority with whose jurisdiction factory is situated and the general public in the vicinity.

The above Sub-section (i) is clear. The workers and also the general public and the local authority (the Gram Panchayat or Municipality) has a right to get information about dangers and health hazards involved in a prescribed manner. The prescribed manner is given in Rules under this Act, which are drafted by State Government. The DGFASLI’s (Director General of Factory Advisory Services and Labour Institutes) office has published model rules under the Act. Maharashtra Factories Rules gives a detailed format of the Material Safety Data Sheets (MSDS) to be provided by occupiers of factories. 41-B(3) says information furnished under subsection (i) shall include accurate information as to the quantity, specifications and other characteristics of wastes and the manner of disposal.

41-B(7) says occupier shall lay down measures (with approval of Inspector) for the handling, usage, transportation, storage of hazardous substances inside the factory and the disposal of such substances outside the factory premises and publicise them (the measures) in the manner prescribed in the Act, among the workers and the general public living in the vicinity.

The above sections make it clear that right to accurate information exists under the Factories Act, 1948. The groups active on environmental issues, unions and even small groups of worker can get very important information by exercising this right. The local authorities (the Gram Panchayats, Taluka Panchayats, Municipalities and their representatives) have this right.

Violation of Section 41-B, 41-C and 41-H may result in punishment upto seven years imprisonment and fine upto 2 lakh rupees. This fine gets extended by Rs. 5,000 per day if contravention continues after conviction. (Section 96-A). This is a special provision regarding contravention of sections about hazardous process. 41-C refers to health records and health check-ups.

41-C(a) maintenance of accurate and up-to-date health records of workers and these shall be accessible to workers. 41-C(c) refers to yearly medical check-up of workers. 41-H refers to right of workers to be warned about imminent danger.

There are some factories where annual medical check-ups do take place. Workers are given their records too. During our interventions, in two large factories and one medium scale factory, we saw the records of workers showing affected hearing and lung functions. The report of audiograms (hearing check-up) showed dip at 4000 hertz frequency. But the workers were not told that this indicates Noise Induced Hearing Loss.

**DM is a Factory Inspector:**

There is one more important section that we need to point out here. That is Section 8-(4). Every District Magistrate shall be an Inspector for his district.

A factory inspector may be in a far away place and less approachable. However the village Panchayats, village representatives can always approach the District Magistrate or the Collector of the District. Environmental groups also can take advantage of the above sections. (Smaller factories will have less influence over the DM than over the Factory Inspector). The DM may not be knowing technical details but a DM can make sure violation of right to information. For such and other rights DM’s office can be extremely useful.

**A right unused is a right lost:**

There are many rights under this Act, e.g., in Chapter III of the Act regarding health, Chapter-II regarding safety, chapter-IV-A, regarding hazardous processes, that are not used. The rules under the Act in various States also may be useful. Above we have given example of broad rights provided, but experience shows that they are rarely used by workers and citizens.

As said at the outset, there are many limitations but within these limits too, laws can be used. The limits need to be exhausted by public pressure to actually make use of these limited rights.

To be continued in the next issue.

*Author is a member of COEH team in PRIA*
In the Guise of Welfare

The Struggle of Women Workers at the Workshop of Shradhhanand Mahilashram

*Aaloka Kanhere

Introduction

Exploitation comes in several forms. Exploitation may not mean only 'economic' exploitation in terms of employers giving workers less than their due, but also more general exploitation, which uses the characteristics of the weaker sections to weaken it further. This is a common experience with sections like the so-called 'lower caste' people, the oppressed ethnic groups and women, especially destitute or single women.

This penetrates different areas of the lives of people – economic, social, educational, health, etc. These are often inter-related and reinforce each other. One of the most common mask this process dons is that of the so called 'unorganised sector'. The concept of the 'unorganised sector' comprises several very different types of people working in different work-sites under very different conditions of work.

The following is a story of how one such ugly mask of exploitation is gradually being dismantled by the determined efforts of about 150 women. The site of the story is the Parishramalaya of the Shradhhanand Mahilashram, at Matunga, Mumbai.

Legislative provisions may be used to strengthen people; they may also be used to weaken and oppress people, to further exploit them. In this case-study we have a glimpse of how legal provisions and legal structures of various types have played a negative role in the lives of over 150 women workers who have spent their entire youth working for the Shradhhanand Mahilashram.

Methodology

This paper is an attempt to document the problems, including health problems as well as the struggles of about 150 women workers in a workshop attached to the Shradhhanand Mahilashram. It is based on the many meetings and interactions we had with the women workers, the union people and the research workers involved with the struggle. This exercise was conducted by PRIA in June 1998.

We spoke to about 15 of the women and other activists involved in the process of organising. We also saw the departments where the women work and went through most of the documents.

The Shradhhanand Mahilashram (S.M)

The Shradhhanand Mahilashram is run by the Hindu Women's Welfare society. This is registered under the Public Trusts Act of 1950 and under the Societies Registration Act XXI of 1860. The S. M at Matunga, in the centre of Mumbai, was established in 1928. In the year 1967, it expanded its activities to Vasai where an old people's home was established. In 1974 it again expanded to Kurla. Its activities include: shelter to girls, women and the aged; sponsorship and adoption activities; educational activities; marriage related activities including reconciliation and counselling and vocational and employment related activities.

From the annual reports of the S. M it is obvious that the vocational and employment activities, also called the Parishramalaya, are completely separate activities from the rest of the S.M. The Parishramalaya includes the motor winding unit of the large company, Crompton Greaves Limited, and another garment unit of an international garment company. The activity of motor winding began in the year 1967.

In fact, these activities are even physically and in terms of the personnel quite separate. None of the 150 women working at the motor winding unit stay at the S.M., they are in no way connected to any other activity of the S.M., and what it stands for either in reality or in people's perceptions. It is purely an economic activity that yields large chunks of income for the S.M and the Crompton Greaves Company. The company is an internationally acknowledged player in the world market and has the ISO 9000 certification. In order to retain its ISO certification, the
Crompton Greaves Company supplies all the raw materials, tools and machinery for the manufacturing process to the S.M. Besides, the company has its own supervisors stationed at the S.M. to test and ensure the quality of the motors the women in S.M. produce. The Company also employs several thousand workers, mostly men, in its two units at Bhandup and Worli (Mumbai).

A worker who does the same work at the parent plants of the company earns no less than Rs. 10,000/- a month. On the other hand, the women who work for Crompton Greaves through S.M. are paid Rs. 1,500/- on an average. Most of the time they earn less and work more as the payment is piece-rated which is abysmally low. Shradhanand Mahilashram is a registered charity institution. It receives money by cash donations as well as donations in kind and grants. It also gets substantial amounts of money through the income earned out of the toil and labour of women workers. The production work was started to 'help' women earn money. The question that arises here is: Who is it helping in reality? One expects the donations to be large, and the income to the Ashram out of the earnings of the women to be less. The money generated from women's labour should be properly spent on amenities for women workers and appropriate wages for them.

The reality

According to the Annual Report of the S.M., in year ending on 31-3-96 Crompton Greaves Limited paid the Ashram Rs. 52,18,867/- for the completed motors. After the women were paid wages and 'gifts'(sic) (the term for bonus), the surplus was Rs. 24,92,999/-.

This earning of ashram is 253% of cash donations it received and 186% of the grant received. The labour of the women workers actually seems to be rehabilitating the ashram and not the other way.

In the year ending on 31-03-97, the production was curtailed. Crompton's share in receipts of Ashram is Rs. 38,07,433/-. The net earning in this year was Rs. 16,53,852/-. This is 154% of cash donation and 169% of the grants.

The claim by the Ashram that it is not an employer is patently untenable. As an employer it is earning from labour more than its donations as a charity institution.

The work process

Unlike the stereotypical image of a production activity run by a destitute women's home, the women in this Parishramalaya, are not engaged in work like tailoring or embroidering. The work here involves very heavy engineering work of winding of motors, which are used by the main factories of Crompton Greaves Limited for the production of fans and other finished products. The women assemble 120 different types of motors for Crompton Greaves Limited. Given below are the problems women face in each of the department of the Parishramalaya.

The work involves:

1. Winding work: This involves, winding of the cable over the 'former' from the bobbin. This is done with the help of a machine, which the women operate with their feet. The women also have to control the movement of the cable, which is hot. The main problems they face are injuries to their hands, sudden jolts to their bodies when the cable snaps and callousities to their hands.

2. Stator mounting: The work involves filling the empty motors supplied by Crompton. During filling, the women have to cut the wires with the help of clippers. Stator mounting is the most heavy work in this process. The main problems that the women face are pressure on chest and hands due to continuous lifting of heavy weights. Callousities and sometimes cuts are common.

3. Coupling: The coating of wires must be cut with the help of knives and then the wires have to be joined. They have to be cut with clippers. Six women are involved in this work of coupling. Cuts and callousities are important problems they face. The work involves continuous standing which results in pain in legs and feet.

4. Blazing: Soldering and welding of wires and parts occurs here. The place is filled with toxic fumes. Scalding is common. No welding screen, only dark glasses are given to the women as protective equipment. Increasing effect on vision is an important health problem the women face. Breathing problems due to fumes are also common.

Working conditions at the Shradhanand Mahilashram

The type of work women do at the Parishramalaya of the S.M. as well as the numbers of women who do it, qualifies the production unit to be defined as a Factory as per its definition in the Factories Act. This itself should enable them to get basic facilities like overtime payments.
after 9 hours of work, rest periods after a certain number of hours of work every day, paid weekly holidays, paid annual leave, provision of first aid facilities, basic safety provisions, creche facilities, etc. As per other legal provisions, the women are also entitled to medical facilities, including paid maternity leave as per the provisions of the Employees’ State Insurance Act, and to Provident Fund and Gratuity on retirement.

However, neither the ashram nor Crompton Greaves gives the women any of the above basic facilities. The ashram does not organise medical check ups though most women face medical problems frequently. The ashram does not provide the women with refreshments. They only get some bananas, groundnuts and tea, for which also they have to pay. They are allowed only one day off in a week, which in reality is not a paid weekly off because women work on piece-rate wages and women are not given an extra day’s wages by averaging out the weekly wage, as should be done. If there are holidays because of some festivals the women are called on Sundays to fill the required number of days. No Provident Fund and pension is given to the women even after nearly 30 years of working. No paid leave is given even if they have to undergo major surgery. Only what they get daily after a long and hard day’s work is theirs.

The ‘youngest’ woman, i.e., the one with the least number of years in the factory, has been working for over 10 years. There are women who have put in more than 30 years of work. ‘All through our youth we have worked, in the Ashram, and what have we got instead? What do we show for our life’s toil?’, the women ask with tears in their eyes. These tears are of anger and rage and due to a feeling of being betrayed. Another important feeling is that their health has been sacrificed at the altar of greed.

Health problems

Health problems at the work place was an issue that at one time galvanised the women. One of the women worker who was pressurised to do one specific type of heavy job fell seriously ill such that she had to leave the job. The other women workers had also begun to realise that all was not well with them. Severe body pain, especially pain in neck, back and shoulder seemed to affect them all.

Other problems included tingling numbness of their fingers, eye and ear problems, callosities on hands and feet and injuries that take a long time to heal. Severe to mild breathlessness, mental stress and head ache was also experienced by a majority of women workers.

Most women working in Shraddhanand Mahilaashram complain of regular chest pain due to heavy work. Many of them complain of lumps in the breasts. They also face many gynaecological problems, such as menstrual problems like irregular periods, increased flow, painful periods etc. There are frequent miscarriages amongst the women. Some women complain of infertility, which they feel is because of the heavy work. Most of the women suffer from eye-ailments. Many of them have undergone eye operations.

According to the women, ‘We are paid according to the number of motors we assemble. The job is highly technical and involves a great deal of concentration. Many of us have health problems simply because we have to do a high-pressure job without any breaks. Even the much-needed weekly off is not paid for. If we have enough holidays and paid leaves, it is possible for us to recover from some of our illnesses.’

Miscarriages occur due to heavy work, especially if it continues up to the third trimester of pregnancy. Callosities heal if rest is given. If maternity leave is not paid, women will have to continue to work whatever the situation or problem. If women do not have access to paid sick leave, women have to continue to work with their scars and with the scalding and unhealed wounds.

Conclusion

To begin with the S.M, management had succeeded all these years in not letting the women organise themselves by deploying several ways. One was the entire atmosphere of a charity institution, where even asking for ones rightful dues is not only frowned upon, but one is made to feel guilty for ever doing it.

Secondly, they tried their best to create a feeling that the place of work was not a factory or any commercial establishment, by deliberately using terms like ‘gifts’ instead of the much accepted ‘bonus’. The term ‘gift’ has several connotations. It implies a relationship of not rights but favours and there is also a connotation of servility.

Also, throughout the several decades that the women were working there, the women seemed mortally scared of the supervisor. The relationship between her and the women workers was more like a head-mistress and students at best, or like a slave-driver.

* Author is a student who did the study for PRIA. Kindly contact PRIA for detailed report.
Mismanaging Hospital Waste

Study conducted by PRIA in Mumbai
*Sangeeta Malshe

Introduction

In recent years, the mis-management of hospital waste has become critical in urban areas. At present, there is no operational policy on hospital waste management at the national, or local level. According to a survey by SRISHTI, about 93% of the hospitals in Delhi have no disposal system of their own. The danger of exposure to infectious hospital waste is particularly acute for rag-pickers who try to salvage any discarded material from dumping sites. Certain initiatives have been taken at all levels to counter this problem, but they have not been very successful. Some hospitals have installed incinerators, but incineration done in an improper manner has further compounded the problem.

A study was conducted by PRIA to assess the means and quality of hospital waste management at various hospitals in Mumbai. A detailed study on hospital waste management is not possible without the co-operation of the management. Since the management was very evasive about their waste management strategies in the hospitals approached, the report is based only on the information which we could gather on the basis of informal discussions with the employees. The following report presents first some general aspects of hospital waste management as relevant to the study and then the findings of the study.

General information relevant to the study

Large heaps of what is termed as "clinical waste" are a common sight near hospitals. Unlike most household wastes, this category of waste is potentially hazardous and infectious and thus requires special treatment and disposal facilities. The Ministry of Environment and Forests has framed draft rules called Biomedical Waste (Management and Handling) Rules, 1995. According to these rules, biomedical wastes are to be handled following prescribed procedures that specify authorisation, responsibility of generators and operators, segregation, packaging, transportation, storage, treatment, disposal, maintenance of records, accident reporting and follow-up and import and export methods.

Colour-coding system

Hospital waste begins to pose a threat to human welfare when mixed with municipal waste. As per the provisions and powers conferred under Sections 6, 8 and 25 of the Environment (Protection) Act, 1986, the Central Pollution Control Board recommended some guidelines regarding this issue. One of these is that hospital wastes are to be segregated in different categories and then collected in colour-coded bags or containers so as to avoid mixing up of wastes.

Incineration

Incineration has been recommended for infectious wastes. Hospitals that are not in a position to install incinerators of their own have been asked to collectively install common incinerators. Theoretically, incineration is simple - solid waste is burnt at high temperatures and converted into mostly carbon dioxide, water and 10-12% of its original solid volume. In reality, due to proper protocols not being followed, incineration actually ends up doing more harm than good. Because waste is not segregated effectively, all kinds of waste find their way into incinerators. Burning of certain materials releases lot of toxins into the atmosphere. What is ironic is that many of the incinerators are located in the hospital premises and thus pollute the very places they were meant to keep clean.

Study of waste management in Mumbai Hospitals

A study was conducted to see if the hospitals in Mumbai were following the prescribed protocols and if there were differences in waste disposal methods between government and private hospitals. Of the four hospitals studied in Mumbai, two were private hospitals and two were municipal hospitals. As a result of this study, it was revealed that most hospitals were not bothered about the effects of incinerators. They were also not aware of what hap-
pened to the products of incineration - whether the ash generated was sterilised, etc.

In most of the hospitals having more than 50 beds, there is a colour-coding system. The following is an example of non-uniformity in practice in Hinduja Hospital and King Edward Memorial Medical College and Hospital in Mumbai:

<table>
<thead>
<tr>
<th>Table: Colour-codes recommended in two hospitals in Mumbai</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hinduja Hospital</strong></td>
</tr>
<tr>
<td>Red: Bed-sheets, clothes etc. that are stained with blood, body fluids. Fate: Sent to laundry.</td>
</tr>
<tr>
<td>Black: Household and non-infectious waste - pantry wastes, paper napkins, packing material, unsoiled paper. Fate: General (Mumbai Municipal Corporation) incineration.</td>
</tr>
<tr>
<td>Blue: Used for sharps, container with biohazards, sign - needles, scalpels, blades. Fate: Separate incineration.</td>
</tr>
<tr>
<td>Yellow: Clinical infectious waste - gloves, syringes, stained gauze, dressing cotton, blood transfusion sets, thoracotomy bags. Fate: Incineration.</td>
</tr>
<tr>
<td>Green: Plastic items for recycling - intravenous sets, vials, tubes, respiratory tubing, plastic wrappers etc.</td>
</tr>
</tbody>
</table>

**Findings based on discussions with Non-Managerial Staff at a Municipal Hospital**

In a major municipality hospital, interviews were conducted, discussions were held with members of the Infection Control Committee (ICC) and with other staff members. As per the discussions held with the watchmen, the information gathered was as follows:

- There is one bin present behind the hospital which is meant exclusively for sharps like needles, scalpels, blades etc. However, due to improper management, other garbage is also put into this bin.
- A bin near a gate is meant for collecting garbage generated in the hospital. The garbage should be placed in the bin before the arrival of the municipal van at 10 a.m. If the garbage is brought after the municipal van has passed by, it should be taken back into the hospital premises. Instead, it is dumped outside even if it means that it must lie outside the gate until the next morning when the van comes around again.
- The garbage is rarely collected in the proper bags at the proper time.
- The bags are often loosely tied.
- The watchman whose duty falls outside the collection gate must put up with the foul smell of the garbage bags. Some watchmen also complained to the management about the risk of infection, but no steps were taken to improve the situation. As a result, the watchmen rarely complete their 8 hours of duty outside this gate and instead, spend much less time here.
- One watchman noticed a private vehicle collecting

A nurse who was interviewed revealed the following facts:

- She was active in the previous Infection Control Committee (ICC) and feels that it was more active than the present one. The present committee is not doing justice to the work and given policies of the hospital - the colour-coded bags are rarely used efficiently and the hospital wastes are mostly not separated.

The information obtained from the ward-boys and Ayahs was as follows:

- The use of colour-coded bags is irregular.
- Glass bottles which are to be recycled are washed with care but are not sterilised.
- Most of the ward-boys and Ayahs get plastic gloves,
even though these offer inadequate protection. But in spite of demanding rubber gloves, none has been given to them. As recently as three years ago, they were not even given plastic gloves.

- Body parts of rabbits, dogs etc. after conducting experimental surgery are thrown into the municipality bins without disinfecting first.
- Expired medicines are thrown into the municipal drains and the bottles are collected in the bins.
- The ward-boys feel that the Infection Control Committee has remained ineffective. The workers' union has also demanded effective functioning of the Committee, but the hospital management has given no reply. The union has kept up its struggle to provide safe working conditions for the workers. While the management has always blamed the ward-boys and Ayahs, it has not given proper facilities to them.
- Most of the ward-boys have no idea of the incineration plant where the hospital waste is taken. They also do not know anything about the ash generated after incineration.
- One woman working as an Ayah said that while it was necessary to perform any kind of duty assigned to them, the management did not provide any safety precautions to them. Often women with AIDS come to the hospital to deliver babies. While the doctors and nurses are given rubber gloves, the Ayahs are given plastic gloves. Ayahs are also not given any plastic aprons as are given to the doctors and nurses. Yet, it is the duty of the Ayahs to clean up the labour room after a delivery has taken place. The chances of contracting an infection are extremely high for them.

Observations in other major municipal hospital in Mumbai

- A colour-coding system is not followed.
- There is no Infection Control Committee. A Health Committee is present and it is this body that decides and delivers the policies on hospital waste.
- A nurse working in the hospital informed us that clothes and bed-sheets of the patients are taken to the laundry without sterilising first.
- All liquid waste is collected and disposed in the municipal drainage. There is also no division between hazardous and non-hazardous waste. All wastes are collected together in a common garbage bin and then the hazardous waste is incinerated.
- Sharps like needles and blades are sent to the common garbage bin after breaking into small pieces, usually without sterilisation. When sterilisation is done, it is not carried out properly.
- Plastic waste generated in the hospital is sold to waste dealers. The Brihanmumbai Municipal Corporation (BMC) always demands tenders from the dealers and the dealer who quotes the least price for disposal takes the plastic-ware. While it is the responsibility of the municipal corporation to know what is to be done with the plastic waste, the dealer does not share this information. This opens the way for unscrupulous recycling and thus increases the risk to the public.
- Test bottles used for pathological tests are re-used after washing and sterilising them. However, sometimes such precautions are not taken by the staff, thus raising the chances of infection. Test samples of stool, urine and blood are thrown into the municipal bins.
- The Pathology Assistant informed us that the hospital waste is collected in the municipal garbage. Rag-pickers always go there to pick up the waste, and the management is ineffective in controlling this practice. The Health Committee is unable to facilitate relations among doctors, nurses and other staff members, so a proper waste management system cannot be established. The Central Pollution Control Board released an ideal system for hospital waste management, but this is not applied here.

Conclusion

After the discussions held, it was clear that the situation as portrayed by the management was not a true one. The official information and guidelines which the management released to the public were very different from the unofficial information gathered from paramedical and other staff. An ideal system of waste management is a dream for hospital employees like the ward-boys and Ayahs. They live in constant fear of contracting deadly infectious diseases like AIDS. Even basic safety precautions and welfare facilities are not provided to them.

* Author is a researcher and consultant

Kindly contact PRIA for detailed report
80,000 polluting units back in Delhi

Indira Gandhi

In what seems to be an environmental and commercial disaster in the making, over 80,000 industrial units that were closed down for operating in non-conforming areas in Delhi will be relocated to a new site, west of the city. The site for relocated industries has been chosen following a Supreme Court order in December 1996 asking the Delhi administration to move non-polluting small scale units from the non-conforming areas to another location. The new industrial units are being developed on a total of 4,500 acres of land. So far 51,000 industrial units have applied for relocation to the new area. The environmental impact of these industries has not been assessed as yet.

Financial Express, New Delhi, July 12, 1998

The human cost of gold

South Africa

Mining is one of the most dangerous jobs in the world. According to ILO, mining causes more than 15,000 deaths each year. Of these South African and Chinese gold miners feature at the top of the casualty lists. According to South Africa’s Minister for Mineral and Energy Affairs, “each tonne of gold mined in the country costs one life and 12 serious injuries”.

Small scale miners also have to contend with dangerous working conditions. The small scale gold-miners carry out a practice handed down from classical times to separate the gold from the earth. Liquid mercury is poured over crushed ore in a pan or sluice to form an amalgam which is pressed by their hand through a cloth to remove the excess mercury and then lit up. Mercury’s toxicity is well known. It enters the body through inhalation, ingestion and skin absorption. Chronic poisoning can lead to insomnia, severe tremors, brain damage and even death. And by entering the placenta, it can cause birth defects.

National Herald, New Delhi, September 23, 1998

Gujarat chemical factory gives workers a punctured nose in gas chamber

India

42 workers at Gujarat’s only basic chromium sulphate factory, Hema Chemicals, suffer from ‘nasal septum perforations’ or simply stated, holes in the nasal wall, splitting the nostrils. Continuous exposure to hazardous emissions has punctured their noses. The company employs over 250 workers.

Punctured nose is only one of the several problems afflicting the workers of this unit which manufactures about 6,000 kg basic chromium sulphate, over 2,000 kg sodium bicarbonate and as much sodium sulphate every day under hazardous conditions, resembling a pressurized container waiting to explode. Other problems include ulcers, dermatitis, weak lungs, affected kidneys and variety of other ailments. Many workers have become physical and mental wrecks.

The only ventilator the factory had till a week ago was the main gate. But it remained closed, to enforce discipline. The workers used to file out of the gate to breathe some fresh air when emissions became too much to bear. Now they do not have even this luxury.

As per a health check-up conducted by the certifying surgeon of Vadodra factories Inspectorate there were 43 cases of nasal perforation and 27 of dermatitis. Many workers are yet to have a check-up. The factory has no full time medical officer and no regular check-ups.

Indian Express, New Delhi, July 10, 1998
Pregnancy test

Mexico

To avoid the costs of legal measures to protect pregnant workers, Maquiladora (Export Processing Zone in Mexico) employers are testing female job applicants for pregnancy. In Mexico, more than half the Maquiladora work-force, particularly in assembly plants, is female.

They hire a lot of young women because they have a reputation for hard work and being anatomically and emotionally more suited to assembly work. According to Mexican law, enterprises are supposed to protect pregnant employees from any task that may represent a threat to their health or that of the foetus. To avoid the costs of these legal measures employers make their workers take pregnancy tests, particularly when hiring. If a woman falls pregnant soon after beginning work in a Maquiladora, she may be forced to resign because of her pregnancy.

Trade Union World, ICFTU, Belgium, March 1998

Inside Radiation Zone

India

Jaduguda's Uranium is the lifeline of India's nuclear programme, but its callous keepers have made life hell for the tribal population of this mining belt in south-eastern Bihar. The Uranium Corporation of India Limited has also admitted that 31 people may be victims of suspected radiation.

Jaduguda, where India's only active uranium mines are located has about 4,000 families who owe everything to the uranium found in its belly - their jobs, their children's jobs, medical facilities, schools and everything else surrounding their lives. The woes of the villagers from six most affected villages have come to light in recent times. A visit to these villages reveals children with deformed limbs, serious blood disorders, congenital deformities and physical handicaps. In the worst village, Tilatiband, there is not a single house where the occupants have not been affected by some sort of weird disease. Jaduguda's residents tell similar tales - of the head of family being a miner and his offspring being born with congenital defects; of more and more cases of impotency and infertility being reported; of old men suddenly collapsing and dying soon after retirement. The incidence of tuberculosis, thalassaemia and blood cancer were rising sharply in the region. Children are dying at a rapid speed.

With so much destruction on the rise, the Uranium Corporation of India Limited is still apathetic to the situation and trying to wash off their hands by claiming that the radiation level is closely monitored and is 'well within' the safe limit of occupational exposure of 20 millisieverts per year.

Indian Express, Bombay, June 21, 1998

Agricultural jobs are twice as deadly

A recent report from ILO has found that agricultural workers run at least twice as high a risk of dying at work as workers in other sectors. The study found that 170,000 workers in the sector die each year as a result of work hazards. Millions more of the global agricultural workforce of 1.3 billion suffer serious injuries, or poisonings from pesticides or agro-chemicals.

The agricultural mortality rates have remained consistently high in the last decade, which is in stark contrast to other dangerous occupations such as mining and construction where fatal accident rates have decreased.

World of Work, Switzerland, No. 22, December 1997

Occupational & Environmental Health Vol. 5 No.2, September 1998
Books

**Child labour in India - a study on magnitude dimensions and determinants**

The book has examined the problem of Child Labour in association with the general complexity of socio-economic and demographic situation of the country. The book envisages the origin of child labour and its detrimental effect on the growth and development of a child.

Author: Dipendra Nath Das
Publisher: Sane Publications - Delhi
Price: Rs 300
Year of Publication: 1996

**A manual for training in workplace health promotion**

This manual is culmination of four year development programme involving a Europe-wide network of training centres. It provides a framework for developing educational and training programmes in workplace health promotion; it is designed flexibly to be appropriate for any occupational group who may be involved in the area. The manual is underpinned by a comprehensive and integrated view of how to improve worker health.

Author: Richard Wyne
Publisher: European Foundation for the Improvement of Living and Working conditions
Price: ECU-40
Year of Publication: 1998

**Visual ergonomics in the workplace**

This is an easy-to-read introduction to the role of visual system in the workplace. It is an authoritative but accessible account which is well illustrated with both humorous drawings and technical figures. It also contains up-to-date look-up tables, guidelines and a discussion of related legislations across the international spectrum. It is a valuable reference for professionals, an authoritative source for employees and a one-stop introduction for students of vision in the workplace.

Author: Jeffrey Anshell
Publisher: Taylor and Francis Ltd. - London
Year of Publication: 1998

**The ISO 14000 EMS audit hand book**

The book provides comprehensive strategies for conducting all phases of the EMS audit, including the effective assessment process for determining improved environmental performance, commitment to prevention of pollution and continuous improvement. The audit concepts, techniques and methodologies presented meet the requirements set forth by international accreditation bodies for training and certification of EMS auditors.

Author: Gregory P. Johnson
Publisher: St. Lucie Press - Florida
Year of Publication: 1997


The Fact Finding Commission on the Plight of Workers was founded by a labour support group and trade unions in West Bengal. The Commission formulated its observations on the issues at stake and the specific cases of workers' plight. The aim was to have an objective assessment free from all bias. Well-documented cases, along with supporting facts and figures were presented before the Commission by workers, trade unions and other representatives from various industries. Of these 64 cases are presented in this book. They cover employees in textile mills, chemical factories, cinema halls, engineering works, jute mills, metallurgical companies, hotels, restaurants, tanneries, transport companies, canteens, stone crushers etc.

Publisher: Linobyte, 55 K K Mazumdar Road, Calcutta 700 075
Price: Rs. 160 (US$ 32)
Year of Publication: 1997
CIS 97-1836 A guide to heat stress in agriculture
This guide outlines the nature and cause of heat stress and describes a programme for protecting agricultural workers from heat illness. The programme involves assigning responsibility for heat problems, training workers and supervisors, acclimatising of workers, evaluating work assignments and the risk of heat illness, managing work activities and rest breaks; provision of cool garments and first aid to ill workers.

CIS 97-1875 Occupational exposure and risk of female infertility
The case-controlled study examined the association between occupational, chemical and radiation exposures and risk of infertility (diagnosed medically). The crude odds ratios of risk were 2-3 times higher in women exposed to these factors than in those not exposed.

CIS 97-1878 Occupational asthma
The causes, clinical features and management of occupational asthma are reviewed. Common causative agents are listed and pathological changes resulting in the airway, inflammation and hyper-responsiveness are outlined. Primary prevention measures are included.

CIS 97-2508 Infectious risks for the health care workers
Topics covered include: health care and associated workers at risk; risk modification; measures (training, safe disposal methods, immunisation); legal requirements; precautions for special diseases (hepatitis, HIV virus etc.)

CIS 97-2109 Alcohol in the workplace; results of an empirical study
The report presents the survey of alcohol consumption among employees in a sample of 45 firms in Great Britain. Results are discussed in relation to drinking behaviour, effects of alcohol on work performance, sickness and absence due to alcoholism, alcohol related attitudes, workplace culture and alcohol politics.

Reader's Query
Q. In India, under the scheme, what is the accepted criteria for establishing a case of Occupational Dermatitis (Contact or Irritant)? Is patch testing or photo-patch testing mandatory or optional? How to prove that the exposure has taken place at the workplace, and not somewhere else? (Dr. J. Das, Howrah)

A. Occupational Dermatitis can be caused by a variety of chemicals. It is therefore, necessary to point out the chemical or chemicals that the affected person is handling at the workplace. The next step includes checking the literature regarding the chemical from various text books and confirming its property (of causing dermatitis). Skin diseases caused by physical, chemical or biological agents, are included in the Schedule III at B-13 of the ESI Act, 1968. When a worker is affected by any disease listed in Schedule III the important factor is to note the occupational risk involved. For the working person, it is only needed to prove that the risk is involved in the occupation and that the working person is affected due to the listed diseases. There is no need for the worker to prove anything except that the exposure has taken place at the workplace which can be proved by the mere presence of the chemical in the work-area. The third legal component is necessity of proving sufficient working period, which for skin disease included in Schedule III-B is six months (Section 52-A of ESI Act, 1968).

Patch tests may be positive in allergic patients. Patch tests are not fool proof as false negative results are possible so it is better to rely upon the occupational history and knowledge that there is a chemical at the workplace which is causing the problem.
PRIA

The Society for Participatory Research in Asia (PRIA) is an independent, non-profit, non-government organisation registered under the Society Registration Act 1860.

Over the last fifteen years PRIA has promoted people-centered development initiatives within the perspective of participatory research. As the cherished mission, PRIA endeavors to promote people-centered, holistic and comprehensive evolution of society characterised by Freedom, Justice, Equity and Sustainability, by

✦ creating opportunities of sharing, analysing and learning among formations of the Civil Society (in particular, people's organisation and NGOs);
✦ engaging in independent and critical analysis of societal trends and issues, development policies and programmes; and
✦ enabling dialogue across diverse perspectives, sectors and institutions.

The focal aim of PRIA's Centre for Occupational and Environmental Health is to promote and contribute towards making work and living place healthier and safer. On one hand the Centre collects information from networks, organisations and individuals through research studies, documentation and data bases and it on the other, disseminates information through bulletin, publications, training/workshops and information service.

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Hearing People's Voice

In any democratic society, state or business, workers and community play a very important and distinctive role. Their contribution becomes more important in the development process when it is going to effect all of them. Industrial development is one such process where industrialists enter an area only with technological knowledge and capital. The other required ingredients, like natural resources and labour are extracted or acquired from the local community with the direct or indirect intervention of the state. The unplanned process of industrial development with the ultimate aim of profit maximisation creates conflict among the key stakeholders. The significance of industrialisation cannot be denied, however, there is a need to rethink “the process” which is involved.

There is a need to recognise that for any industry to survive in an area, collaboration and partnership among stakeholders involved becomes essential. Further there is a need to create space for the local community to voice their views and concerns.

For the past few years, ‘Public Hearing’ has come up as an important mechanism for conflict resolution among community, industry and state. Today in India, public hearings have become mandatory for approval of any major project. As this method is still in its infant stage there is an absence of fool proof method where all the stake holders can take part and contribute. The public hearing is perceived as a common platform where community, industry and state can exchange views and work for a common agreeable future. A future where loss is minimised and benefit is maximised for all. Every one has a small piece of the large complex puzzle and together they can solve it. Public
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The Bulletin

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The editors welcome contributions, which should be typed, double spaced, on one side of the paper only. Two copies should be sent. Illustrations (B/W or colour prints or transparencies, line drawings, tables, etc.) should be included where appropriate.

Queries

The Readers are welcome to send their queries on the various issues of occupational, environmental and consumer health. The selected letters will be printed with replies. If they are not printed, answers will be sent by post. Please address your questions to the editor.

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Hearings are not to confront the extremes but to put together energies of all for common benefits. We must appreciate and value the diversity and join hands in search of common grounds.

The Public Hearing reinforces the faith in people’s capacity to shape their own future and can be successful only if we engage all the stakeholders in open dialogue. On one hand, industry and state are in an advantageous position with direct or indirect control over epistemological instruments. Information is collected and knowledge is built to prove their perspective. Whereas, on the other hand people’s voice, which has been the secret mantra for a successful statecraft, is negated. Even the emergence of first industrial process had the societal sanction on the basis of a promise for a better life. Ironically somewhere in the complex development of an industrialised society we forgot people and they in turn lost their voice in the decision making process. The concept of Public Hearing reiterates the fact that it is ordinary people who constitute the real world and are extra-ordinary source of knowledge.

The foundation of a successful Public Hearing should be built on empowerment of the marginalised groups. This could be done through participatory research surveys, educational events and leadership interventions. PRIA is undertaking a similar learning exercise in Chiplun, Maharashtra. The Public Hearing that is planned in early 1999 would definitely help in searching a way out in this complex scenario. Through this editorial we invite suggestions and experiences of readers on this issue. Jointly we can put the process of industrialisation on the right track where feelings and aspirations of the marginalised are given due importance.
Workers know your Rights!

Vijay Kanhere*

Introduction

This is the concluding article of our attempt to explain the existing labour laws in a simplified way. In the previous article, The Factories Act, 1948 was discussed. The objective of the whole exercise is to spread awareness of the prevailing legal provisions for the workers so that they can make best use of it. In this issue the focus is on the unorganised sector. The two Acts, the 'Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996', and the 'Beedi and Cigar Workers (Conditions of Employment) Act, 1966', are of great importance to the workers in the informal sector, especially those involved in construction work and house-hold units of Beedi manufacturing.

The analysis of the Acts highlights the issue of Occupational & Environmental Health.

Building and other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996

Who is a Worker?

The definition of a worker as given in Section 2(e) of the Act, defines a 'building worker' as one who is employed to carry out any skilled, semi-skilled, unskilled, manual, supervisory, technical or clerical work 'for hire or reward', 'whether the terms of employment be expressed or implied', in connection with any building or other construction work but does not include any such person-

i) who is employed mainly in a managerial or administrative capacity; or

ii) who, being employed in a supervisory capacity, draws wages exceeding 1600 rupees per month or exercises, either by the nature of duties attached to the office or by reason of the powers vested in him functions mainly of a managerial nature.

Please note the words 'for hire or reward' and 'whether terms of employment are expressed or implied'. The implication of employment can be drawn from circumstances, usual methods of employment and traditions. The definition does not demand a written proof. In Section 2(d), building or other construction work is defined, covering a large number of activities such as - construction, alteration, repairs, maintenance or demolition of, in relation to - buildings, streets, roads' railways, etc. Airfields, irrigation, drainage, embankment, navigation work, water works, generation, transmission of power, installation of TV stations, telephones, dams canals, etc. (Except which is covered by The Factories Act 1948 or The Mines Act 1952). This is a wide ranged definition that covers all type of construction activities.

As per the Act for Construction Workers, NGOs and Unions can sue employers for violating health and safety sections. Section 54, "Cognisance of offence" says that no court shall make cognisance of any offence punishable under this Act except on a complaint:

a) Made by or with the previous sanction in writing of the Director General by the Chief Inspector; or

b) Made by an office bearer of a voluntary organisation registered under the Societies Registration Act 1860; or

c) Made by an office bearer of a concerned registered trade union.

In the last article we had seen how most of the Acts allow only the Government Inspectors, to sue employers in case of 'health and safety' violations. This Act enacted in 1996, after a long struggle was certainly a welcome step. The NGOs and construction workers' unions consistently campaigned for years together as earlier there were no special provisions for 'Construction Workers'.

Individual workers cannot directly go to the court. They have to obtain written permission of the Director General or the Chief Inspector. Also the workers have limitation (Section 55) that they can go to the court within three months after the violations. This is too short a period considering the lack of information about the act. The workers are supposed to approach through the union or an NGO office bearer.

Right to information:

There is no right to information or right to get trained (safety & health) under this Act. In case of violations of
other sections, NGO or union can approach the courts and during the court process can try to disseminate some information. This is an indirect and a very slow way of getting information. On the lines of Factories Act, 1948 Section 7 and Section III, new sections need to be added in the Construction Workers Act, 1996.

Welfare Boards are envisaged in this Act. These Boards will collect funds by a cess on employers and contributions from employees or workers. Workers will be registered as beneficiaries.

Before ending this part on Building Construction Workers Act, we will give just one example from the Act. Section (39), is about 'Notice of certain accidents'. Section 39(c) defines reportable accident (an accident injury that results in 48 hours of absence from work). It says, when necessary, authority may order enquiry. Section 39(3) is about fatal accidents.

39(3) - when notice given under (1) refers to an accident causing death of five or more persons the authority shall make an enquiry into such an accident within one month of the receipt of the notice. The irony of law is that the death of one person has no value but only when a minimum of five persons die, would it lead to an enquiry. This Act says within a month that too after receiving a notice. Who gives the notice? Only the employers give the notice. Why the workers cannot give the notice? Why the workers cannot give a notice of a fatal accident to a single worker? "No they cannot," says this Act. Again the State Governments will have to prescribe rules regarding format of the notice.

**Beedi and Cigar Workers Act, 1966 (Conditions of Employment)**

Under this Act, no court can take cognisance of any violation unless the complaint is made by the Government Inspector, or is made with approval of the Inspector [Section 36(1)]. The Court has to be of equal level or above a presidency magistrate of first class [Section 36(2)].

In this Act, no workers or union can approach the court without getting approval of the Government Inspector. The time limit is 3 months. If an Inspector does not act within three months the courts will not hear the complaint at all.

This is what is called real Inspector Raj. Even if an employee is suffering due to violation of an Act, he cannot ask for the court to intervene. Employee has to take permission of the Inspector to approach the court. What can be the basis of such provisions? One basis must be to curtail 'trivial' cases filed by employees and to curtail 'harassment' caused to 'poor' employers. The Inspector will see if there is any ground for the complaint to allow it to reach a court of law. We know how such Inspectors act. If the Inspectors under any act had been sincere, we would not have seen pathetic conditions at work in so many occupations. Still the laws of this, sovereign country do not permit the workers even the time consuming redressal through courts by simply denying them access there. Such aspects of these laws need to be challenged by action as well as legally by a concerted action by Unions workers and NGOs. The organisations working for public interest and fundamental rights need to look into this aspect of laws.

**Who is a Worker?**

Section 2(f), define employee under this Act through any agency, whether for wages or not in any establishment (or go-down) to do any work, skilled or unskilled, manual or clerical and includes

(a) Any labour who is given raw materials by an employer or a contractor for being made into Beedi or cigar or both at home (referred to as 'home worker') and

(b) Any person not employed by an employer or a contractor (or both) but working with permission of under agreement with employer or contractor.

This may be the only Act that takes into consideration 'home workers'. This Act was passed in 1966, after a strong wave of agitation in many states. The result is 'home workers' in the Beedi industry in many states got legal recognition as employees.

We saw a similar result in case of Construction Workers Act, which gave right to Unions and NGOs to approach courts. May be no other act covers home based workers apart from the Beedi and Cigar Act, 1966.

Mark the words 'for wages or not' again in (11), even if the employer says, "this worker is not employed by me", if
the worker is working in the establishment by permission then the worker is entitled for the rights under this Act.

Rights Regarding Health and Safety

Section 8 (cleanliness), "every industrial premises shall be kept clean and free from effluvia arising from any drain, privy or other nuisance". The standards for cleanliness are prescribed by the state governments under this Act. Section 9(1) ventilation for protection of health of persons working, standards as prescribed should be maintained regarding lighting, ventilation and temperature.

9(2) - In case of dust generation by the manufacturing process, authorities may ask employers to take action to prevent inhalation of dusts, fumes or other impurities and accumulation. Section 10, 11, 12 are about over crowding, drinking water and provision of latrines. 13 about washing facilities, 14 about creches and 15 says first aid box as prescribed has to be provided.

Exemptions:

Section 41 says the state government may exempt any class of industrial premises or class of employers or class of employees from all or any of the provisions of this Act and rules made under it. Except in case of women employees regarding sections about annual leave with wages, maternity benefits, creches and night work.

The Government is curtailed from right to exempt employers regarding some sections beneficial to women. Otherwise the state government has a blanket right to exempt employers or premises from any section of the Act. Why such provisions of exemptions, right given to state governments for exempting are retained in almost every act. Such provisions may make the whole purpose of such an Act meaningless.

Conclusion

Until 1996, there was no special Act for construction workers. Various organisations spread all over India came together to campaign for the rights of construction workers. The sustained campaign is based on and draws its strength from the local activity in various states. This campaign proposed a draft bill to the government. The government proposed its own draft. This was criticised squarely by the campaigners. In 1996, the Act in its present form became Law of the land. It is not a satisfactory Act, though it has given rights to the NGOs and Unions who can sue employers for violations. Court cases take years and workers get bogged down in long drawn legal hassles. The result is uncertain. The law may be clear but how it gets twisted, how facts are presented or interpreted decides the result and the time consumed/wasted. And corruption in implementation and many times even in legal machinery is a serious drawback.

What is the use of laws? Law has an important role in stating expected conditions and (moral) legal duties of concerned strata. Minimum wage laws are more violated than implemented. Does it mean we should not have minimum wage laws? Does it mean we should not inform workers about their rights or that they are not receiving minimum wages? Many workers are unaware about the prescribed minimum wages. If they know the wages as per the law, it does not change anything not immediately, may be not even later. They know they get less wages. They come to know one more fact that it is an illegal act by employers. They may come to know the risky remedies. If a single worker complains to Inspector s/he may lose job and even at places there is risk of physical attacks.

We firmly believe that what to do with any knowledge is the decision of the affected persons. To know one's rights or even to know that "one has very limited rights", is the fundamental right of every person. The more the persons know their rights the possibility that remedial action may take place increases. We can only facilitate the process. As we know many educated college/school teachers sign the receipts of larger amounts than they actually receive. They are obviously educated, but not organised enough to resist the above exploitation. They know that they are deceived. Many workers know they are less paid but they may not be aware about their legal rights such as laws regarding minimum wage, right to know about chemicals and their effects.

One phase in the remedial process is knowing legal rights. It is in a way a minor but important phase. We are attempting to contribute in a small way in the above long drawn process of remedial action regarding health and safety.

*Author is a member of COEH Team in PRIA
Sewerage Workers of Patna
Sanjeev Pandita*

Introduction

Waste generation is a fact of urban life; with every house, industry and other establishments generating a certain amount of liquid waste. This sewage is poured into an underground sewerage system that more or less traverses the entire city. Once the filthy waste is drained out of the houses and the industries, nobody bothers about what happens to it. It bothers only when some sewer gets blocked and unbearable odorous sewage oozes out.

There are some people who make a living by working in these sewers. Commonly known as 'sewerage workers', they are primarily employed or contracted by the Municipal Corporations. The maintenance of the sewerage system is no doubt a dirty job. It involves regular monitoring, removing of garbage and other solid wastes which block the sewers. Worse, these workers are also expected to dive in to the sewer to remove the blockage. Regular working in such an atmosphere makes them prone to contracting dreaded diseases. To make matter worse, they have to work with primitive equipment without any protective measures. Of course, the sewerage workers’ status is among the bottom-most of the social rung.

In its effort to highlight the problems faced by sewerage workers across the country, PRIA and the OHSC (Mumbai), have already carried out a detailed study on the sewerage workers of Mumbai1. Present documentation, carried out by PRIA in July 1998, in association with AITUC, Patna, deals with the working condition of the sewerage workers of Patna.

Sewerage workers of Patna

The Patna Municipal Corporation (PMC), regulates the area of over 110 sq. kms with a population of about 20 lakh. The city has an underground sewerage system that was constructed decades ago. Originally it was designed to cater to the needs of only 5 lakh people. Since then Patna’s population has increased many fold and the sewage generation has exceeded the existing capacity of the sewers. PMC employs just 3000 workers for the overall maintenance of the city. They include safai karamcharis and sewerage workers. Safai karamcharis, mostly the women, broom the streets and collect garbage.

There are some 200-210 sewerage workers for the maintenance and cleaning of the sewers. Of these, 110 belong to a group known as 'Calcutta Gang'. The name comes from their origin as they were called specially from the Calcutta Municipal Corporation in 1976 for cleaning the sewers. The rest are local people. Almost all of them are Dalits and have been doing similar work for decades.

Work Process

In general, there are three types of sewerage workers:

1. Machine operators: They do not go inside the sewer lines and operate machines that remove debris from the clogged sewers.

2*Detailed report is available with PRIA

Occupational & Environmental Health 4 Vol. 5 No. 3, December 1998
2. Manual workers: They go inside the sewer lines for cleaning during clearing operations when machines fail to work.

3. Divers: They actually swim through the sewer pipelines to find the blockage and clear it.

In Patna, such categorisation is not visible. Any sewerage worker may have to do all sorts of jobs e.g. operating machine, going into the sewer and cleaning it or even diving through the dirty water.

There are no fixed hours of work for these workers, they may be called for work anytime and for any number of hours. They have to work even on Sundays or any other holiday if the situation demands. Most of the work is done manually. Workers generally work in the group of 3-6, the number can increase if the problem is severe. They are provided with some basic instruments like rod, bucket, rope, shovel, spade, etc. They are not given any protective devices nor even the basic facilities like gum boots, hand gloves, torches or PVC suits. Any respiratory equipment is out of question.

A worker enters into the sewer through a manhole. He has to take out his clothes and descents merely in an undergarment. The diameter of the manhole is too short and the worker has to creep to get inside the sewer. As soon he enters the sewer, he is exposed to toxic chemicals and hazardous waste. Due to bio-degradation of the waste, formation of many harmful gases takes place inside the closed sewer. These include Carbon Monoxide, Methane, Ammonia and Hydrogen Sulphide. Usually the concentration of these gases is above the safer level. The workers are not provided with any instruments to test the concentration of these gases inside the sewer. Besides, the workers are also exposed to many harmful chemicals and toxins. Once into the sewer, worker is at the mercy of God. Many workers have died in the process.

### Socio-economic Condition

The workers of the 'Calcutta Gang' live in Patna without their families. Their families are in West Bengal. They have been provided quarters by the PMC, on a monthly rent of Rs 150. These quarters consist of one small room without any windows. They cook in a corner of the room. The workers who have not been allotted quarters live in the adjoining slums. The maximum wages of a permanent sewerage worker is Rs 2911. They receive no overtime even though they work for more than 12 - 16 hours each day. They do not receive any reimbursement for working on Sundays or any other holidays. During the survey it was discovered that due to financial crisis in Bihar, the PMC had not even paid them wages for the previous two months. In spite of this, the workers were working overtime.

### Hazards at Workplace

Given below is the graphic representation of the hazardous gases, chemicals and toxins that exist in sewer and their effects on health:

<table>
<thead>
<tr>
<th>Gases</th>
<th>Effect on health</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Ammonia (NH₃)</td>
<td>Causes skin and eye irritation. Long term exposure damages the skin. Repeated exposure even in small levels leads to impairment of lung.</td>
</tr>
<tr>
<td>b) Chlorine (Cl₂)</td>
<td>Causes irritation of eyes and upper respiratory tract. Higher concentration causes dyspnea, anxiety, vomiting, cyanosis and even death.</td>
</tr>
<tr>
<td>c) Hydrogen Chloride (HCl)</td>
<td>Causes conjunctival irritation, superficial corneal damage. It also affects respiratory system.</td>
</tr>
<tr>
<td>d) Hydrogen Sulphide (H₂S)</td>
<td>It is both irritant and an asphyxiating gas. It causes irritation of whole respiratory track. At higher concentration it exerts an immediate paralysing effect on respiratory system and causes death.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Metals</th>
<th>Effect on health</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Arsenic</td>
<td>Causes skin lesions as well as skin cancer. Impairs blood vessels. Inhalation may cause lung cancer.</td>
</tr>
<tr>
<td>b) Chromium</td>
<td>Causes skin ulcers, perforation of nasal septum and lung cancers. Chronic bronchitis is a very common effect.</td>
</tr>
<tr>
<td>c) Lead</td>
<td>Causes anaemia, damage to our nervous system.</td>
</tr>
<tr>
<td>d) Mercury</td>
<td>Causes tremors, anxiety, distress, damage to kidney.</td>
</tr>
</tbody>
</table>

Source: The Sewerage Workers of Ahmedabad City, Published by KSSM and UNNATI, 1997

Occupational & Environmental Health Vol. 5 No. 3, December 1998
Health & Safety Measures for Workers

- The workers do not have access to any of the basic health services, not even proper drinking water. There is no safety officer in the corporation. The workers are also not given any training on safety. There is no health check-up for the workers.

- Often the walls of the manhole are slippery and often cause injury. Sewage often has some sharp objects that cause injuries to the workers.

- The predominant cause of accidents among the workers is the presence of poisonous gases in the sewers. Due to the lack of any testing equipment the workers are quite unaware of their presence. Some gases like Carbon Monoxide are odourless resulting into deaths. In 1996, when a worker who had gone inside the sewer did not return for a long time another worker went down to look for him. When he too did not return, the other workers became suspicious and asked for help. Both the workers died of suffocation. There are many such cases, most of them go unreported. The gas concentration in the sewers may not always be at the critical level so as to cause death or unconsciousness but may be concentrated enough to cause chronic effects like respiratory disorders, gastro intestinal problems and other cardiovascular troubles.

- Working in such unhealthy conditions makes workers more susceptible to various diseases and infections. During the survey it was found that almost every worker suffered from one or other disease related to his work environment. Respiratory disorders are common. Skin diseases are also very common as all of them work without any protective equipment. Many harmful pathogens are present in the sewage and when worker dives into it, the pathogens enter into his gastro intestinal tract and cause many infectious diseases like typhoid, cholera and dysentery.

Other Problems

The woes of poor sewerage workers do not end here. When a worker dies due to any accident, PMC does not pay proper compensation to his family. A meagre sum of Rs 3000 is paid which is not even sufficient to perform the last rites.

The salary increments, bonus and other benefits that are due to workers as per the law have not been paid to them. As per an estimate by the union of the PMC staff worker, PMC owes each worker approximately Rs. 50,000.

Conclusion

The above mentioned problems are only few of those suffered by these workers. Besides what is apparent, other problems like the social ostracization of these workers as they are considered to do ‘dirty work’, the loss of family life as they usually work at nights and sleep in the daytime remain unnoticed. Due to lack of education and unawareness chances for any change in occupation are few. Our observation in different cities reiterates the fact that their plight is similar everywhere, despite the fact that the city will go paralytic if they stop working even for a single day. The irony of the situation is that the group which spend its whole life doing dirty and risky work is not even recognised for their work, far from being remunerated properly.

*Author is a member of COEH.*

Wishing you a Safe and Healthy New Year
Workers in Destitution
A Study of Coir Workers in Kerala
G. Placid*

The Coir industry, the most ancient and also the largest employer in terms of the number of workers involved, is the second largest source of non-agricultural employment for the poor in the state of Kerala.

Traditionally, it has been the occupation of women from the Hindu low-caste families and it continues to be their major occupation till date. However, the coir industry here is yet to undergo modernisation and mechanisation, which the workers feel would pose a severe threat to their survival. Coir sector in the state is already suffering from unemployment, lower productivity and the lowest wages.

Major fibre extraction and yarn-spinning units are concentrated in the coastal districts of Thiruvananthapuram, Kollam, Alappuzha and Ernakulam. And hence 80.8 per cent of the Coir households and 82.7 per cent of the Coir workers are located in these districts. Manufacturing units are mostly concentrated in Alappuzha, Chertalai and Vaikkom. Production of coir mats is done by and large on handlooms. Use of traditional methods in processing and manufacturing of handlooms are the main characteristics of this industry in Kerala. Of the two varieties of fibres i.e. white and brown, Kerala monopolises in the production of white fibre that is superior to brown in quality.

Out of the total annual production of 1.55 lakh tones of Coir in India, Kerala contributes 70-80 per cent. During 1996-97 alone, 45,540 tones of Coir and Coir products worth Rs. 210.57 crores were exported from India, and Kerala contributed 96 per cent to it.

Another feature of the industry is the prominence of co-operative sector. Co-operatives play a decisive role in the industry. The main contribution of the co-operative movement in the coir industry has been to assert the rights of the workers by correcting the market forces. The private sector is forced to revise its wage structure on the model of the societies. Coir co-operatives share the problems of corruption, politicisation, inefficiency and losses with co-operative movement in the state.

With an immense scope of development due to the presence of natural and labour resources, irony is that the coir industry is one of the most neglected industries today. If the resources are properly pooled up so as to revive the industry, it has the capacity of boosting the state’s economy.

Nature and Structure of Production:
Coir is made from the fibre extract of coconut husk. White fibre extracted from retted husk is superior to the brown fibre, which is extracted from dry husk; generally by machines.

The production of Coir is somewhat a complex process and can be divided into seven stages, i.e. retting, extraction of fibre, cleaning, drying, pith removal, spinning and manufacturing of various products. Retting consists of immersing the bundles of raw husks in pond, canal or backwater for a specific period (three to eight months) to loosen the fibre-binding material of the husk. The retted husks are taken out of the water and beaten by the wooden or iron mallets to pull out the fibre. The extracted fibre is cleaned by washing and then dried in the sun. The dry fibre is again beaten up by long sticks in order to remove the pith from it.

The fibre is then ready for spinning into yarn. Spinning is done either by hand or with the help of simple tools called 'rett'. Beside using the traditional rett (89.45 per cent), motorised rett (10.5 per cent) and automatic spinning machines (0.05 per cent) are also used for spinning. The yarn is used to make various articles like rope, mat, geo-textiles, etc. Mechanisation has brought in some modification and reduced the length of the process as well as its drudgery.

The coir industry can be classified into five sectors such as household sector, co-operative sector, private coir yarn products, factories and coir establishment units. Traditionally, the coir manufacturing at homes by women is identified as the household sector. In 1995-96, there were 1,91,656 households in this sector. Members of households used to buy raw husks and rett from nearby waterlogged places and extract fibre or buy fibre from other sellers and produce yarn with the help of the family members. The household sector consumes more than 49 per cent of the total available fibre. Later, individual entrepreneurs started small Coir yarn units.
Co-operative movement, started in 1950s, has played a very important role in the coir sector. The co-operative movement in Kerala has its beginning in the coir sector. The aim behind starting co-operatives in the coir sector was to check the exploitation of the workers by the private owners and safeguard their interests and rights by increasing wages, improving working conditions, avoiding commission agents and middle men, etc.

Though the wages and working conditions of the workers in the societies are comparatively better than those in the private sector, many problems are yet to be solved. These include the non-availability of husk, low priority, market fluctuation, debts, etc. As a result of these, most of the societies are running in losses. None of these societies is capable of paying the statutory minimum wages. Many societies are dysfunctional and some of them face the imminent threat of liquidation.

**Coir Workers - A General Scenario**

Coir workers can be classified into three categories i.e.:

- **Primary worker** (a person whose main income comes from coir industry);
- **Secondary worker** (one whose income from coir industry is only a secondary source of livelihood) and
- **Ancillary worker** (a person having more than one occupation but works for some time in the coir industry)

According to a survey of coir industry in Kerala (Kerala Statistical Institute, 1997), out of the total 3,62,440 coir workers in the state (1995-96), 84.4 per cent are primary workers, 12.8 per cent ancillary workers and the remaining are secondary workers. Among the 3,15,980 primary and secondary workers about 91 per cent are in the spinning sector and the remaining in the manufacturing sector.

The total number of coir households (every house has at least one coir worker) in the state (excluding ancillary workers) being (1995-96), the average number of workers per household comes to 1.65.

The majority of workers (82 per cent) are women. The reasons being the low wages, work requires a lot of patience and because the craft of coir manufacturing was started by women as their leisure occupation. These are the older women who dominate the industry, the highest number being in age group of 45 and above (38.4 per cent), followed by the group between age of 35-44 (23.2 per cent). There is a growing tendency among the younger ones (men or women) to keep away from the occupation.

In fact, the number of workers has been dwindling for past few years. Figures of the sector-wise employment indicate that while the product sector employs more men (75 per cent), the spinning sector employs more women (88 per cent).

Till the establishment of the trade unions the treatment meted out to the workers by the private owners was abhorral. The workers survived at the mercy of owners. Thanks to the trade unions and the co-operative movement, the situation has considerably changed. However, compared to the workers in the other sectors, the coir workers are at a terrible disadvantage in regards to their wages and other rights. The wages are very low, varying from place to place and depending upon the nature of work. The average wages for a coir worker prior to 1990s were around Rs. 20. Today it ranges between Rs. 30-35 although the minimum wages fixed are Rs. 60 - 65. But nobody pays minimum wages fixed for the workers, not even the co-operatives.

**Trends in the 1990s**

The 1990s witnessed a change. With the trade unions and the co-operatives becoming stronger, the private owners found it hard to satisfy the demands of the workers. They found an easy way out by hiring workers on contract basis. The workers worked under a contractor in their own homes as casual labourers. The employers resorted to this tactic mainly to avoid paying fringe benefits to the workers.

As a result of the influence of the co-operative sector, some of the positive changes like hike in wages and bonus were adopted in the private sector. But comparing the socio-economic condition of the coir workers prior to 90s, it was observed that the situation has deteriorated in the 90s. Despite the rise in wages upto Rs 40, comparing the changes of the wage structure in other sectors and the price fluctuations, the wage level in real terms only declined. The average daily wages of a male coir worker was Rs 70, while the female worker was given only Rs 28 for the same period. Discrimination in the wages between male and female workers and different sectors is conspicuous. For instance daily wages for male workers varies from Rs 50 in spinning co-operatives to Rs 98 in factories. The rate for female workers varies from Rs. 24/- in spinning co-operatives to Rs. 50/- in factories. This indicated that the spinning sector offers the lowest rate. Further the survey (coir industry, Kerala) data reveals that 51.6 per cent of the coir households have an average monthly income of Rs 1,000 or below (11.2 per cent having only Rs. 50.1) and only 3.8 per cent have more than Rs 3,000.
Severe poverty and indebtedness continue to be the major issues of the families of the Coir workers. Owing to the low level of wages (Minimum Wages Act is yet to be applied in this sector) and irregularity of work, the workers find it hard to meet even their subsistence needs. The food they consume is low in nutritional values. Condition of those employed under private owners is even worse. Market fluctuations have devastating impact on the self-employed in the household sector. Those who run home-based units too are suffering due to high raw material cost and low price for finished products, both of which increases their debt burden.

Health Hazards

Health hazard is another important problem of the sector. The working conditions are far from healthy. The workers in the retting section have to stand in dirty water for hours. The beating, cleaning and spinning operation are done mostly in the open ground subject to sun and rain. Women working for long hours in the hunched sitting position develop health problems. While spinning with the traditional rett the workers walk forwards and backwards for up to 15 kilometres a day on slushy and dirty ground.

Due to unhygienic working conditions the workers are prey to a variety of health hazards such as filariasis, asthma, dermatitis, prolapsus uteri, fungal infections, backache and premature ageing. A substantial portion of their income goes into the treatment of ailments.

Impacts of economic reforms and the response of coir industry

The 1990s witnessed a number of developments in the coir sector. The major change was in the mode of production. Modernisation was introduced both in the spinning and weaving sectors of the industry. One of the welcome factors of 90s is the positive response of the political parties, trade unions and even workers towards mechanisation. With a view to modernising the coir industry, the government of Kerala initiated an Integrated Coir Development Project, with the assistance of the government of India. The major objective of the scheme was to establish 100 mechanised de-fibering mills and 200 motorised spinning units in the co-operative sector. Units started getting commissioned from March 1996 onwards. This was a positive step initiated by the government towards modernisation and mechanisation.

The first technological change was introduced in the area of spinning. Traditionally spinning was done manually by hand with the help of a 'rett'. In the changing scenario work had to be made less arduous and more productive. After several experiments the treadle 'rett' was introduced. Later it was motorised. It helped reducing the drudgery and improving the quality and quantity of the yarn. The drawback of the mechanised 'rett' is that it has reduced the engagement of the workers, rendering many jobless. Also the high cost of the 'rett', which now is around Rs. 1,10,000, is beyond the reach of many. Only about two per cent of the spinning is mechanised today. Despite the inhibitions to adapt mechanisation, efforts are on to introduce newer technologies in order to compete in the global market. The Coir Board is at present offering two-month training for the women for improving their skill in using motorised 'rett' and also providing 'rett' at subsidised rates to those who have successfully completed the training.

The next change was introduced in retting process. Traditional retting in ponds and backwaters took as long as six to eight months. The process was also laborious and unhygienic, the workers had to stand in polluted water for depositing and retrieving the husks. A series of experiments in improving the retting process using bacterial cultures in R.C.C tanks led to quite positive results. The retting time was first reduced to three months and then to three days. This was a big achievement since not only time could be saved, the work could be made lighter and relatively pollution free. However, these innovations have remained more or less confined to the laboratories as the new method has yet not been adopted by the workers. They either follow the old methods or depend on mechanically extracted brown fibre from Tamil Nadu, which for want of water, had recourse to the process of extracting fibre from the 'unretted' fibre through mechanical means. However, this fibre is inferior in quality. Though the mechanisation has been introduced in the product manufacturing, the traditional handloom production dominates the scene.
Recognising the coir industry as a big source of revenue from the national as well as the international market, the government has also introduced different schemes to make it an organised sector. Some of these schemes are: the establishment of a welfare fund; old-age pension; family pension; medical care; scholarships for the coir workers and their families. An innovative step by the government was the establishment of model Coir village, which included the construction of houses for SC/ST workers, construction of sanitary latrines, smokeless chullahs, 'rett' sheds, beating sheds. This scheme, started already in 1998 was extended during the 90s. However, the scheme has suffered a setback in the recent years.

An important step towards the welfare of the female workers has been the constitution of the Mahila Coir Yojana in 1994. The members of this scheme are eligible for privileges like the free supply of Coir-retts (facility for retting the husks).

A very interesting, but sad, fact is that now-a-days nobody is interested in organising the Coir workers and conducting struggles for them, because there is very little income in the sector. For instance only a few agitations were organised during the 90s in the co-operative sector and that was only for demanding more monetary benefits. For the workers getting the lowest (and insufficient) wages, there is no incentive for the organisers. Another reason is that most of the workers are women. In fact most of the trade union members are men. One reason why there are fewer agitations in the Coir sector is that the trade union leaders are easily influenced by the factory owners and traders.

CIS

CIS 98-596 Yearbook of labour statistics 1997
The topics covered in this yearbook include accident absenteeism; agriculture and forestry; banking and insurance; coal mining; commercial activities; construction industry; fatalities; frequency rates; hotel industry; manufacturing industries; mining and quarrying; occupational accidents; office work; power generation and distribution; public water supply; services; statistics and report.

The study analyses the accident pattern of female assembly workers in the Swedish automobile industry. The topics include accident proneness; age linked differences; assembly-line work; causes of accidents; location of injury; motor vehicle industry; occupational accidents.

CIS 98-721 Occupational risk management: Lead at work
The documentation was done in Australia. The focus being on the effects of lead; it describes the health hazards of lead; determination in blood; hazard evaluation; implementation of control measures; medical supervision; permissible levels; plant health organisation; and transfer to other work.

CIS 98-779 Reproductive effects of paternal exposure to chlorophenate wood preservatives in the sawmill industry
The study conducted among the sawmill workers in Canada, it describes the antifertility effects; chlorophenols; dioxins; exposure evaluation; parental exposure; sawmilling industry; teratogenic effects; and effects of wood preservatives.

CIS 98-795 Diesel fuel and exhaust emissions
The topics include information regarding the health hazards of carcinogens; diesel oil; criteria document; diesel engines; exhaust gases; functional respiratory disorders; ILO; IPCS; irritants; literature survey; renal diseases; skin absorption; skin diseases; toxic effects; toxicology; UNEP; WHO.
Work Related Fatalities and Injuries

The Ministry of Labour, Japan has released official statistics 1997, on the number of work-related fatalities and injuries. The total figure for 1997 was 156,726, a decline of 6,136 from the previous year's figure of 162,862. This figure represents the lowest level of fatalities and injuries ever.

The highest number of fatalities and injuries occurred in manufacturing (47,054; 30.0%), construction (41,688; 26.6%), and overland freight hauling (16,455; 10.6%).

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<th>Industry</th>
<th>1997 (Jan-Dec.)</th>
<th>% of Total</th>
<th>1996 (Jan-Dec.)</th>
<th>% of Total</th>
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<td>Total</td>
<td>156,726</td>
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<td>162,862</td>
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<td>53,884</td>
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Polluting Companies will be made to pay

The Supreme Court of India has ordered the Medak District Judge to frame guidelines for industry to pay compensation to farmers for damaging their land through the disposal of untreated effluent. One thousand and one hundred farmers in the Pattancheru, Bollaram and Nakra Vagu basin, will be paid a total of Rs. 32.38 crore.

This order has shaken the industry. It is expected to put in place a mechanism that will make the polluting industry directly responsible for the pollution they cause. According to the Central Pollution Control Board, industrial sites across all states are heavily contaminated particularly with mercury and cadmium. Cleaning up of these sites involves thousands of crores of money. Since the state will not be able to meet such costs, industry will have to cough up the funds.

Economic Times, Delhi, November 15, 1998

Pollution costs India $80 billion annually

India loses a whopping $80 billion annually, on account of sickness and death from pollution and economic costs attributable to resource degradation, according to the World Bank. The loss due to poor environment is pegged in excess of $20 billion a year by conventional calculations and nearly $80 billion in purchasing power parity (PPP) terms, according to the World Bank’s Annual Environment Review.

Deteriorating water quality due to poor sanitation, industrial effluents and pesticide runoff; lack of clean water, poor solid waste management and air pollution are the key environmental problems in South Asia, it said. Dwind-
ling forests, coastal wetlands and freshwater bodies and poorly managed protected areas; soil degradation in agricultural lands; energy-related damage from commercial sectors and the impact of global climate change, particularly in low-lying areas like Bangladesh were some of the other problems.

*Killer disease on loose at workplace*

India ranks among the highest in the world as far as occupational deaths are concerned. Though there is no dearth of statutory provisions to deal with this issue, huge gaps in the legislation, leading to their non-

implementation result in work conditions that seriously harm the worker's health. Every year over 5,000 people die in India due to diseases picked up at their workplaces.

*Observer, New Delhi, January 12, 1999*

Air Pollution threatens life

A recent UN report on the environment and health says that nearly four million children die annually of acute respiratory infections from air pollution. Asthma has been on rise in the industrial world by 50% during the last 20 years.

Another World Bank report says that Indian cities are choking with industrial and vehicular pollution. The number of deaths in 1995-96, due to air pollution has increased by 28% from about 40,000 in 1991-92. Vehicles, thermal power plants and industrial units in Delhi are the major toxic air pollutants. Delhi is ranked fourth among the 41 polluted cities of the world monitored for air pollution. Delhi is at the top in lung diseases with 30% of its population suffering from respiratory problems due to pollution by poisonous gases.

*The Tribune, Chandigarh, December 30, 1998*

Chip Industry Raises Environmental Concerns

One of the greatest myths about the computer industry is that it is not as harmful to the environment as the belching, oozing industries of the past. Indeed, the chips that power sleek new PCs are extremely clean. But it takes large amounts of water and toxic chemicals to get them that way.

Computer chips were first produced in large numbers in Silicon Valley, an affluent area in South of San Francisco, stretching 50 miles to San Jose. The region is home to pioneering companies, such as Sun, Apple, and Intel.

Silicon Valley was the first to benefit from the computer industry's success, but it was also the first to have to deal with accompanying problems. The chip industry uses thousands of chemicals, many known for causing cancer or birth defects; many others are still not fully understood. In 1982, a number of birth defects in South San Jose, were blamed on a nearby Fairchild Semiconductor plant. The plant was found to have leaked chemicals deep into the surrounding land, sparking a government investigation that found a majority of computer-related manufacturing plants in the area were suffering similar leaks.

The chips used in desktop computers are tiny, especially in comparison to the 10 gallons of purified water needed to create it. According to the SVTC, manufacturing one 8-inch silicon wafer requires more than 3,000 gallons of water, 27 pounds of chemicals, and leaves nine pounds of hazardous waste. Intel's plant in New Mexico turns out 5,000 such wafers each week.

The chemical-exposure accidents have also occurred at chip plants. A 1995 accident at the Teccor plant in Irving, Texas, sent several employees to the hospital after they inhaled fumes from spilled acids. The following year, 30 workers at a Zilog plant in Idaho, settled out of court for $2.25 million after suing their former employer. The workers said chemical exposure caused miscarriages and other health problems.

Resources

Books

Data Management for Occupational Health and Safety

An integrated occupational health and safety computer system is an invaluable tool that enables professionals in occupational medicine, industrial hygiene and industrial safety to share information. Such a system requires sophisticated database design and technology, skilled programming, and software design experience.

This book underscores the importance of a partnership between software specialists and health and safety workers in the development of the product. It emphasizes the importance of sound record keeping as a way of protecting the data vital in the company.

It features:

- information that enables user to be part of the development process,
- an overview of details for system development that requires user decisions and understanding,
- lists technical concepts in easy-to-understand language

Author: Constance P. Wrench
Publisher: Van Nostrand Reinhold - New York
Year of Publishing: 1990

Solid Waste Management - Models, Assessment, Appraisals and Linkages in Bangalore

This book deals with 'formal' and 'informal' handling of solid waste in Bangalore, India. The municipal services and the plight of thousands of people who earn their living from the waste are analysed. It also probes into the extensive trade and manufacturing of re-cycled glass, paper and plastics in Bangalore.

Editors: Isa Baud & Hans Schenk
Publisher: Manohar Publishers and Distributors, N. Delhi
Year of Publishing: 1994
Price: Rs 200

Health and Safety Awareness - A Complete Package for One-Day Training Workshop (A Set of Two Volumes)

This package offers trainers a cost-effective and professional alternative to sending managers to off-site seminars. The book contains all the necessary training material, which takes care of the time-consuming process of compiling in-house.

Each set includes:

- A Trainers Guide - complete with timetables, full lecture notes, master for handouts and transparencies.
- A Participants Guide - Contains course notes, practical exercise and worksheets.

Editors: Phil Lowe & Kim Kennedy
Publisher: Koyan Page India Private Ltd, New Delhi
Year of Publishing: 1996

Preventing Absenteeism at the Workplace

This is the first study of workplace absenteeism and ill health to cover all member states of the European Union. The report describes and assesses national regulations and statistics, documents the perspective of government and social partners and reviews strategies to reduce workplace absenteeism. The main focus of the study is upon analysis of experiences in leading companies with measures to address the causes of absenteeism related to ill health.

Authors: R.W.M. Grundemann, C.V. van Vuuren
Publisher: European Foundation, Ireland.
Year of Publishing: 1997
Price: ECU 34

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