

## Plight of Asbestos Victims in India

**Gopal Krishna**

*Ban Asbestos Network of India – Toxics Link*

### **Abstract**

*This paper presents the plight of asbestos victims in India. It highlights the governmental role in the continuing import of white asbestos, which has been banned in almost 40 countries world over, and the toll it has taken. The way the Indian Government has sacrificed even the pretence of representing the public interest at the altar of corporate interest's naked lust for profit and at the cost of human life is illustrated through its stance at the World Trade Organization. The Government is meant to represent the public interest, but by its promotion of use, manufacture and import of white asbestos it compromises the very premise of its existence. Transparency, accountability and liability of the Government and Corporations, which are involved in the asbestos trade, assume enormous significance given the incontrovertible evidence against this killer fiber.*

### **Introduction**

The epidemic of illness and death that is plaguing the developed countries with an estimated 30 deaths per day is being repeated in India. But the Government is pretending ignorance about the consequences of asbestos exposure under the influence of industrialists who fund the political parties. The Government has ensured that there is no documentation of the victims of asbestos exposure. It believes that lack of documentation means absence of problem. India is using asbestos in exactly the same way as the developed countries did until about 1980. The Government's own records show that the danger from asbestos was documented in India as early as 1968.<sup>1</sup>

Although there is indisputable evidence that asbestos causes asbestosis, lung cancer, and mesothelioma, asbestos mining, milling, and manufacturing continues. But the asbestos industry sponsored scientific controversy over the role of asbestos fiber types in India has made the experience of asbestos-exposed workers and citizens in asbestos-affected communities invisible, allowing the industry to escape accountability for its practices.

The result of widespread use of asbestos in the European countries, United States, Canada and others has resulted in millions of deaths and over a trillion dollars in personal and property damage. But instead of learning anything from the experience, in order to remain in business the asbestos companies from the developed world have moved most of their operations to countries such as India where there is little awareness about the hazards from asbestos.

The Chrysotile Asbestos Cement Products Manufacturers Association says: "White asbestos is a naturally-occurring mineral with no harmful effect when used in a controlled manner. Asbestos-related diseases are associated with crocidolite or blue asbestos and other amphiboles. Crocidolite is not used in India, since its import was banned in 1994."<sup>2</sup>

The Indian Ministry of Commerce and Industry goes a step further by informing the Lower House of the Parliament on August 2, 2002: "there is no conclusive study conducted by health experts to suggest that manufacturing of asbestos products causes lung diseases and there is no proposal before the government to close down these units."

On August 18, 2003, the then Union Minister of Health and Family Welfare, Sushma Swaraj, made the following statement in the Upper House of the Parliament: "Studies by the National Institute of Occupational Health, Ahmedabad, have shown that long-term exposure to any type of asbestos can lead to the development of asbestosis, lung cancer and mesothelioma."

On 19th July, 2004, echoing industry's opinion Namo Narain Meena, Minister of State for Environment and Forests said: "as no scientific study establishing that the use of white asbestos causes lung cancer is available, it is not considered as desirable to ban the use of white asbestos." The Minister was asked to bend by the industry, one wonders why he is crawling.

### **Indian Asbestos Products Manufacturing Industry**

"The Indian asbestos cement industry is growing with an annual turnover of Rs 20,000 million and has immense potential but there has been opposition from a few sections of society regarding the use of chrysotile asbestos cement products which need to be addressed. In India only chrysotile (white) asbestos is used and most of it in manufacture of cement based products so it is of importance to know the health consequence of this particular usage," said A K Saraf, Chairman, Asbestos Cement Products Manufacturers' Association (ACPMA). The ACPMA Press Release dated 11th November, 2003 said: asbestos cement products are environment friendly and are produced under controlled conditions which are safe for human beings. The low cost, pollution control equipment, progress and limitations of substitute fibres were discussed. That the ACPMA and the Asbestos Information Centre (AIC) are one and the same became evident from their Press Release. But interestingly, the Release says, AIC is a non-profit organization, which was formed in 1980 under Society's Registration Act 1860. The AIC is attached to the Asbestos International Association, USA having 32 countries as its members. In 1985, the members of the AIC manufacturing asbestos cement products formed an association, ACPMA, registered with Registrar of Society. ACPMA has 13 members with 34 manufacturing units located in various states providing direct and indirect employment to 100,000 persons.

The ACPMA has launched a Public Relations campaign through PR agencies through ads in National Dailies like Hindustan Times, Economic Times and advertorials in magazines. National dailies like Indian Express and The Financial Express carried four page supplements as features glorifying asbestos cement; earlier The Times of India and The Economic Times chose to put profit above public health by carrying features saying white asbestos is safe.

The Ban Asbestos Network of India (BANI) wrote to these dailies, pointing out the medical and scientific evidence against white asbestos. It was only Dr Sanjay Baru, Editor of The Financial Express and Business Standard that responded by carrying BANI's viewpoint.

The Financial Express published the BANI letter saying:

“With reference to the news report ‘Asbestos Cement Products Are Safe’ published in The Financial Express on 5th November, there is concrete evidence both nationally as well as globally which suggests that asbestos cement is as harmful as the cancer causing fibre. The Chrysotile Asbestos Cement Products Manufacturers’ Association (CACPMA)'s claim that raw asbestos would not come into any direct human contact during manufacture of sheets in any factory in India and the raw material was fed into the system with its packing intact is an exercise in sophistry.

The ‘demarcation between asbestos and asbestos cement products (ACP)’ is a myth. In reality asbestos containing products like asbestos cement remain hazardous and lethal throughout their life cycle. The industry will have the citizens believe that it can control wind erosion of asbestos fibres present in the asbestos cement through technology. World Health Organization (WHO) has categorically said, chrysotile asbestos (white asbestos) is cancer causing. The Indian asbestos cement industry has mastered the art of misinformation campaign to the detriment of every citizen's health in general and workers in particular due to asbestos exposure. WHO says all forms of asbestos are carcinogenic.

Worldwide there is a trend towards use of asbestos-free products. Japan went ahead and banned it. The most significant among the three meetings was the one held at Ottawa in Canada from September 12-14. It may be noted that Canada is the world's second biggest exporter of white asbestos (chrysotile), a class one carcinogen. The final resolution stated that by dumping more than 95 per cent of its asbestos in other countries, Canada is ‘promoting occupational and environmental racism.’

The Indian Association of Occupational Health (IAOH) has passed a resolution (in April, 2002) seeking a ban on the use of all forms of asbestos. Occupational health experts also called for banning the material at a meeting of the Bureau of Indian Standards (BIS) called by the Ministry of Consumer Affairs in February 2003. The Financial Express should investigate and publish a full-page report on the dangers of white asbestos in the public interest.”

The Indian asbestos cement products industry has 13 major players, with an estimated production of 1,460,000 tonnes and sales of 1,405,000 tonnes in 2001-02, which represents 80% of installed capacity. About three-fourths of India's asbestos is imported, mainly from Canada. In 1995, Canada exported 509,575 tonnes of chrysotile, of which 42,936 tonnes came to India, making it the fourth biggest consumer of Canadian asbestos. There are some 673 small-scale asbestos factories in India.<sup>3</sup> The major asbestos players formed the Chrysotile Asbestos Cement Products Manufacturers Association (CCPMA) few years ago.

Asbestos cement makers argue that it is a cheap material, ideal for use in developing countries. 50 per cent of the sales of asbestos cement are in the rural sector and 30 and 20 per cent in the industrial and urban sectors respectively. However, its affordability is due in part to favourable government policies. Asbestos attracts only an eight per cent government duty, while steel, for example, attracts 15 per cent. Such incentives are spurring the asbestos industry to expand. Ramco Industries for instance is raising its asbestos capacity at Arakkonam to 120,000 tonnes, from 100,000 tonnes.

The Indian Government has also been reducing the customs duty on asbestos fibre in recent years (from 78 per cent in 1995-96 to 25 per cent in 1999-2000). This is extremely dangerous at a time when more and more countries are phasing out the manufacture and use of asbestos products, as it will lead to asbestos dumping in India.

Given its wide range of applications and the fact that it has been in use for so many years, there is today a substantial asbestos burden in India. It is estimated that there are some 3, 000 products in daily use which contain asbestos. Some examples from “establishments primarily engaged in manufacturing asbestos textiles, asbestos building materials, except asbestos paper, insulating materials for covering boilers and pipes, and other products composed wholly or chiefly of asbestos” are<sup>4</sup>:

- Asbestos cement products: e.g., siding, pressure pipe, conduits, ducts
- Blankets, insulation for aircraft: asbestos
- Boiler covering (heat insulating material)
- Brake linings, asbestos
- Brake pads, asbestos
- Building materials, asbestos
- Carded fiber, asbestos
- Cloth, asbestos
- Clutch facings, asbestos
- Cord, asbestos
- Felt, woven amosite: asbestos
- Floor tile, asphalt
- Friction materials, asbestos: woven
- Insulation, molded asbestos
- Mattresses, asbestos
- Millboard, asbestos
- Pipe and boiler covering
- Pipe covering (insulation), laminated asbestos paper
- Pipe, pressure: asbestos cement
- Roofing, asbestos felt roll
- Rope, asbestos
- Sheet, asbestos cement: flat or corrugated
- Shingles, asbestos cement
- Siding, asbestos cement
- Table pads and padding, asbestos
- Tape, asbestos
- Textiles, asbestos
- Thread, asbestos

- Tile, vinyl asbestos
- Tubing, asbestos
- Wick, asbestos
- Yarn, asbestos

### **Minerals and Metals Trading Corporation (MMTC)**

Under the provisions of the Import and Export Policy of the Government of India the Minerals and Metals Trading Corporation (MMTC) is designated as a canalising agent for the import of raw asbestos from foreign countries. The MMTC imports the raw asbestos in bulk, purchasing the same from foreign sellers. It then enters into sale agreements on what is known as a high seas sales basis with the various users of raw asbestos to cater to the needs of the users of raw asbestos.

### **Hyderabad Industries Limited**

Hyderabad Industries Limited (HIL) of the CK Birla group has proposed to set up a Rs 250 million project at an undisclosed location in northern India to produce fibre cement sheets and accessories. It has not yet secured environmental clearance for the project.

In May 2003, HIL had secured environmental approval to expand its plant at Kondapally in Krishna district from the present 30,000 tonnes per annum to 45,000 tonnes per annum at a cost of Rs 30 million.

More than twenty years ago, Hyderabad Asbestos Cement Products Limited (now known as Hyderabad Industries Limited), used to mine asbestos Abandoned in 1983, the Roro mine, a white asbestos mine some 20 km from the district headquarters Chaibasa, West Singhbhum district, in Jharkhand State of India supplied asbestos to the asbestos cement industry. During its operations, around 4-500,000 tonnes of asbestos were produced annually. This was one of the largest asbestos mines in India, employing about 1,200 workers, mostly tribals. It's not known how much profit the company made from the asbestos produced at the Roro mine, but the company's current annual turnover is around US\$ 67.4 million.<sup>5</sup>

The mine's closure was preceded by a period of labour unrest and intense trade union rivalry. Issues of occupational safety, exposure and the health of workers were raised. According to an old issue of *Singbhumi Ekta*, a weekly from Chaibasa published between January and August 1981 by the late P Mazumdar, leader of the United Mine Workers Union (AITUC), 30 workers from the Roro mines died of asbestosis (a debilitating lung disease caused by asbestos fibres). The issue was raised in the Indian Parliament by then Member of Parliament Indrajit Gupta, but no action was taken against the company.

In December 2002, a fact-finding team visited the area to carry out a preliminary assessment of the asbestos waste and its impact. The team followed this up with an indicative health survey, in January-February 2003, whose findings suggest that the careless closure of the mines and the unscientific disposal of toxic asbestos by the company posed a serious threat to the health of the local community and the environment. The cross-sectional health survey of 14 villages around the Roro hills (45% of respondents were former workers at the Roro mine)

indicated a probable link between working in the asbestos mines and various persistent health problems.<sup>6</sup>

A public hearing for those affected by asbestos wastes failed to break the frozen passivity of the Government. There has been no response to the fact-finding report or the public hearing from Hyderabad Industries Limited. The company now imports most of its asbestos from Canada.

### **Visaka Industries**

Visaka Industries came into being in 1981 under the Indian Companies Act, 1956 bearing the name Visaka Asbestos Cements Products Limited. The main objective of the company is to manufacture asbestos cement sheets, pressure pipes and accessories. The company in early infancy was a joint promotion of Andhra Pradesh Industrial Development Corporation (APIDC) and a band of energetic entrepreneurs: Dr. G. Vivekanand, G. Vinod and Mrs. G. V. Kalavathi (their mother). Its first venture was the manufacture of Fibre Building Products. As of now the APIDC has divested its entire stake. Its production declined in 1989 due to a strike by workers for nearly five and half months. For the manufacture of building products, the company gets raw materials in the form of asbestos fibre and cement; the former is imported from Lab Chrysotile Inc., of Canada and Sama Fibres of Brazil, while the latter is sourced domestically, that is, from companies like India Cements Ltd., Orient Cement and Rajashree Cements. The company has entered into an agreement with M/s. Marubeni Corporation of Japan.

The company was renamed Visaka Industries Ltd on August 9, 1998. The company's activities are organized into two operating divisions namely, Asbestos Cement and Textile-Synthetic Yarn. The segments are the basis on which the company reports its primary segment information. The Cement Asbestos Products division products – asbestos sheets and accessories – are used mostly as roofing material. The company set up a plant in Bengal in 2003 and on January 16, 2004 decided to expand its capacity by 50% at the Nagpur Spinning Unit at a cost of Rs. 320 million.

Visaka Industries Limited, reported a net income of US\$10,599,890 for the quarter ending September 30, 2004, an increase of 25% on the previous quarter's results. The company's new asbestos plant in Tumkur, Karnataka was scheduled to begin operations in April, 2005.

G. Vivekanand is the Managing Director of Visaka Industries and is also the Chairman of CCPMA. Vivekanand is the son of G. Venkata Swamy, former Union Textile Minister. Venkata Swamy was in the race for the chief ministership of Andhra Pradesh. His other son G. Vinod is the Labour and Employment Minister in the Andhra Pradesh State Government. Venkata Swamy is the Deputy Leader of the ruling Congress Party in the Lok Sabha, the Lower House of the Parliament.

When Vivekanand was asked whether Visaka's move to enter spinning is because of the growing global concern about asbestos being environment-unfriendly and hazardous, he is quoted as saying: "In the west, blue asbestos fibre was used as an insulation material in construction for which users got incentives and hence, was misused. It had over 100 fibres

per cc. The asbestos cement sheets Visaka makes has 8% asbestos fibre and it is not sprayed and dust levels of 0.1% per cc are maintained. Moreover, asbestos is a naturally occurring fibre. Also, studies have shown that white asbestos fibre is safe for usage if dust levels are maintained below 1% per cc.” (Exactly what these figures are meant to represent is left to the reader. Ed.) He also claims that health records of all his workers have been maintained for the last 20 years and not one of them has had a problem.<sup>7</sup>

### **Everest Industries**

Everest Industries (formerly Eternit Everest), has a 16% share of the domestic market for asbestos-cement sheeting; the vast majority of its output (80%) is used for rural low-cost housing and industrial structures. Although growth in this sector is predicted to continue, Everest is hedging its bets and now produces non-asbestos building boards for use in false ceilings, panelling, doors and prefabricated structures; sales of these have increased by 44% during 2004.

### **Assam Asbestos Limited**

Assam Asbestos Limited, Calcutta is a prominent business group in Eastern India. The company manufactures and distributes Rhino brand asbestos Cement Sheets and Roofing Accessories in North Eastern India.

### **Roofit Industries Limited**

Roofit Industries Limited, for instance, secured the Environment Ministry’s approval in October 2004 to set up a Rs 2.5 million project at Sanganer, Jaipur district to produce 35,000 tonnes asbestos sheets and 10,000 tonnes asbestos pipes.

### **Ventakeshwara Pipes Limited**

Ventakeshwara Pipes Limited secured environmental approval in November 2004 to complete a Rs 297,000 project to manufacture asbestos pipes and couplings at 22,000 tonnes per year capacity.

### **Hindustan Asbestos Industries**

This was established in 1984 in Bhiwadi, Rajasthan. It is the leading manufacturer and supplier of asbestos millboard. Its customers include National Aluminium Co. Ltd (NALCO), Durgapur Steel Plant and L&T Ltd etc.<sup>8</sup>

The other companies that have secured environmental approvals to expand capacity or set up new units include Everest Industries Limited, Ramco Industries Limited, GB Asbestos Pipes and Mahadev Asbestos Private Limited.

### **Role of International Asbestos Industry in India**

Union Minister of State for Coal and Mines, Dr. Dasari Narayana Rao informed the 38th Annual General Meeting of the Federation of Indian Mineral Industries that India continues to import high value minerals like asbestos.

Clemant Godbout, chairman of Asbestos International Association (AIA), Canada who clearly appeared to be under immense pressure from the growing movement seeking a ban on asbestos said, "Rotterdam Convention is bad. It's a problem. It's a big mistake against a good product. Canada proposes objection to the Convention along with the group of over 60 countries where white asbestos is being used."

Godbout was speaking at the two day International Conference on Chrysotile Asbestos Cement Products during 10-11 November 2003, which took place in New Delhi. One participant asked how the asbestos industry is likely to react to the plan of the environment journalists who are planning to sue publications like The Times of India group and The Indian Express group for carrying asbestos advertisements. Brigadier (Retd) V Pattabhi, Business Consultant, Building Products, India replied on behalf of the Asbestos Cement Products Manufacturers' Association that the advertisements were in fact articles written by journalists and that asbestos cases in courts bring the asbestos industry publicity.

As a backdrop to this international conference, a group of asbestos victims from Gujarat and Rajasthan are making a representation to the National Human Rights Commission (NHRC). Even as the widow of Kodanthan Pani Azhakappan whose husband died after 28 years of service in Shree Digvijay Cement Co. Ltd is on her way to NHRC, conference delegates from different countries told the gullible Indian media that white asbestos is safe.

Godbout said, "there is a big difference between amphibole and chrysotile. Chrysotile is the reality. We are working with safer usage. There are products like cellulose and poly vinyl alcohol, which can replace it but it is more durable, cheaper. He asked, could anyone prove that white asbestos is less safe than the alternatives? We want answers and proof. The principles of safe use must be applied. Only a few countries have banned it. We respect their right to ban it but they must also respect our right to use it."

He said, "the two day International Conference on Chrysotile Asbestos Cement Products is the best conference he has ever attended. AIA will hold another meeting as we need to meet more often to strategize. We are the ambassadors of chrysotile fibre in our respective countries. These ambassadors came from countries like Russia, Kazakhstan, Greece, USA, Canada, Iran, France, Bangladesh, Zimbabwe, Switzerland, Sri Lanka, Poland, Cuba, El Salvador, South Africa, Thailand, Brazil, Philippines, Mexico, Belgium and Indonesia."

The Asbestos Cement Products Manufacturers' Association (ACPMA), New Delhi had organized this International Conference on Chrysotile Asbestos Cement Products. The subject of the conference was "Scientific Review on Health & Environment Aspects and Economic Relevance."

The participants at this conference included Dr G Vivekanand, chairman, Visaka Industries, D B Deb, Deputy Director General, Directorate General, Factory Advice and Labour Institutes (DGFASLI), Ministry Labour and Dr Jacques Dunnigan, President, J D Inc. Canada.

DGFASLI feigns ignorance of its studies, which concluded that even in controlled conditions asbestos workers continue to suffer and it made no material difference in their condition.<sup>9</sup>

Job related accidents and diseases don't just "happen". They are caused. For example, cancer which accounts for a third of all work related death, can be caused by asbestos, other carcinogenic dust and chemicals.<sup>10</sup>

Interestingly, after the international conference, the same DGFASLI published an "Evaluation of Fibre Dust Levels in an Asbestos Cement Sheets Company" in July-Sept., 2004. This study was carried out by Regional Labour Institute, Chennai in a company engaged in the production of corrugated asbestos cement sheets for roofing and other applications. The study was conducted with the objective of assessing airborne fibre dust levels in the work environment and to suggest remedial measures wherever necessary to improve the work environment. Its findings and recommendations manifest the influence of the Industry sponsored conference. The study reported "airborne levels of asbestos fibres at all the locations in production area and general atmosphere surrounding the Plant were found well below the permissible level of asbestos fibre i.e. 1 fibre/cc." However, it recommended "precautionary and remedial measures to further improve the environmental conditions which included prompt repair of damaged fibre bags, periodic checking of efficiency of bag filters, filing of AC sheets in wet condition, sprinkling of water while manually breaking the sheet scrap, effective use of respirators among workers, etc."<sup>11</sup>

The other participants included Dr Kevin Browne, former, member of UK Medical Board, Dr David Bernsten, consultant toxicologist, Switzerland, Denis Hamel, Director, Asbestos Institute, Canada, Dr V Rajgopalan, Chairman, Central Pollution Control Board (CPCB), S A Bhimraja, Vice chairman, ACPMA, Dr S P Vivek Chandra Rao, Hyderabad Industries Limited, Prof. L T Elovskaya, Russian Academy of Medical Science, WH Collaborating Centre, Russia, Dr G Mataka, Medical Advisor, SMM Holdings Pvt Limited Zimbabwe, Iqbal Ahmed, Senior Asst. Director, Head, Fibre Toxicology, Industrial Toxicological Research Centre (ITRC), Lucknow and Amitabh Tayal, Managing Director, U. P. Asbestos Limited, M R Rajput, deputy director, Regional Labour Institute, Y Srinivasa Rao, senior vice president (technical), M/S. Eternit Everest Limited on "India", Rubens Rela Filho, president SAMA, Brazil on "Brazil" and D B Mundra, senior vice president, Hyderabad Industries Limited.

Iqbal Ahmed does not seem to read the published work of ITRC conducted under the leadership of his colleague Dr Qamar Rahman. ITRC has conducted studies on asbestos since 1970 as Experimental studies, Environmental monitoring and Health surveys. Recently under a Central Pollution Control Board sponsored project ITRC has conducted studies in asbestos-based industries both in the organized and unorganized sectors. The studies included 18 units in unorganized sectors of Beawar and Deogarh in Rajasthan along with 5 units in organized sectors of Mumbai and Aurangabad in Maharashtra.<sup>12</sup>

It can now be understood how the Indian Government's eight-member expert committee constituted in August 2001 became defunct under the Chairmanship of Dr V Rajagopalan, the then Joint Secretary, Ministry of Environment and Forests who is now the Chairman of CPCB. The committee was to formulate a long-term policy and strategy to deal with issues related to asbestos – imports, mining, manufacturing, safety aspects of mining, use of

products and health and also environmental considerations. When Dr Rajgopalan was asked about the status of the Rajgopalan Committee report, he said that the committee has finalised the norms for the asbestos industry. When asked how the Ministry's role then differed from that of the BIS, he would only say that the BIS sets norms for asbestos products and the Ministry does the same for the asbestos industry. He added that the committee has not recommended any ban on asbestos. Not surprisingly, he is the darling of the asbestos industry.

Some prominent participants were Dr G V Subramaniam, director, Indian Ministry of Environment and Forests, Tatishev, Kazakisthan and A K Saraf, ACPMA, E V Kovalluski, Russian Academy of Medical Science, Russia, Dr Arti Shukla, Department of Pathology, University of Vermont, USA, J Bridle, Managing Director, International Centre for Asbestos Research, University of Glamorgan, Wales, U.K, Dr John Hoskins, independent toxicologist, U.K, Dr Lakshmi Raghupati, additional director, MoEF. Dr T V Ranga Rao, Medical Director, Central Labour Institute, and G Sanjeeva Reddy, All India President, Indian National Trade Union Congress (INTUC).

One now understands why the INTUC did not participate in the seminars of BANI. Last heard Dr Raghupati was arguing about how it is safe to use white asbestos at a seminar organized by PHD Chambers of Commerce and Industry, an industry body on "Environmental Accounting". It was later learnt how compromised were the credentials of J Bridle in the UK.

Others included Dr P K Sishodiya, Deputy Director, Directorate General of Mines and Safety (DGMS), Dhanbad, O.P. Jagetiya, President, Hyderabad Industries Limited and Dr Louis Perron, Canada's senior policy advisor on asbestos.

The active participation of the Ministry of Commerce and Industry, Ministry of Environment and Forests, Ministry of Labour, Government of India and The Asbestos Institute, Canada, Confederation of Indian Industry (CII) and the Asbestos International Association, USA underlined the fraternal relation between the International asbestos industry and the Indian Government.

### **Asbestos Mining in India**

The Ministry of Mines approved a S&T Project in 1998 entitled "Study of Pollution Level in Asbestos Mines and Processing Plants in Rajasthan." It was undertaken by the Indian Bureau of Mines (IBM), a subordinate office of the Ministry. It was to assess the feasibility of lifting the ban on expansion of asbestos mining through a scientific study of pollution levels in asbestos mines and processing plants in Rajasthan and in Andhra Pradesh and to suggest appropriate mitigation measures. The study recommended that the ban imposed on grant and renewal of mining leases and expansion of mining may be lifted subject to control of pollution level in work environment of various operations and other remedial measures. Recommendations of the study have been examined in consultation with all stakeholders. Some stakeholders have suggested that asbestos mining can be permitted with appropriate safeguards. IBM in consultation with the Central Pollution

Control Board has been asked to work out these safeguards. At present, the ban on mining of asbestos has not been lifted. The Minister of State for Coal & Mines, Dr. Dasari Narayana Rao gave this information to the Parliament.<sup>13</sup>

The BANI has asked all Ministers and legislators as well as the public to work towards a complete ban on the trading of the harmful, potentially fatal material.<sup>14</sup>

### **Asbestos Usage in India**

Ten months after the heart-rending school fire tragedy in Kumbakonam, Tamil Nadu State, India in which 94 children perished, there is hardly a school with thatched roofing in Tamil Nadu. Now these schools are using asbestos sheets as shades despite protests from civil society groups. According to T Prema, a teacher in a matriculation school in Kumbakonam, “The kids are wilting under the excessive heat that penetrated through the asbestos sheets during summer. It is very difficult for us to concentrate on teaching under the sweltering climate. It also poses health hazard to students.” Education Department officials say, “we have allowed asbestos sheets as a temporary solution on the promise given by the schools that they would be replaced with reinforced cement concrete roofing later.”<sup>15</sup>

Asbestos roofs for schools and housing are quite common in India. Asbestos shades are used on all Indian railway platforms for roofing; even soldiers in the Indian Armed forces live under asbestos shades. In the capital city of India, the residences of Members of Parliament and in most cases the Ministers have asbestos roofs.

A succession of governments from 1947 to 2002 bear the greatest responsibility for failing to adopt and enforce measures that could have protected workers from the dangers of asbestos. The control of asbestos at work requires regulations placing the burden on employers and building owners. There is an urgent need to carry out surveys to establish if asbestos is present in their premises, prepare risk assessment plans to deal with the problem and put those plans into effect.

There is a great likelihood of asbestos existing in many city centre office buildings across the country. Maintenance work, renovations or refurbishment to buildings that have asbestos fibre insulation, could scatter the fibres within the building. While problems for maintenance workers are talked about, anyone using the premises is also in danger of exposure.

Martin Barratt, Second Secretary (Commercial), Canadian High Commission in India says, “AIC is of the belief that problems with safe use of asbestos will arise in the unorganized sector. These include small manufacturers who cannot afford to either install the equipment necessary to safely use asbestos or invest in the health needs of their workers.” AIC accepts that “unorganized sector does use imported products that they acquire through agents.” “A ruling which states that subjecting a worker to asbestos is a violation of human rights could have far reaching consequences whether or not it is binding,” adds Barratt.

## **The government's Response**

It is shocking to see that the Indian government is not diligent enough to safeguard the health and environment of its own citizens but remains dedicated to the business interests of Canadian asbestos companies. "Canada is working with other countries to promote chrysotile asbestos. The Indian government has worked diligently in cooperation with the Indian AIC and the Canadian Asbestos Institute. AIC is a member of the Asbestos International Association which represents the interests of the asbestos industry worldwide and has been very active in promoting asbestos in India," according to information provided to this author by the Information Commissioner of Canada.<sup>16</sup>

At the government level, the asbestos issue is a complex one, with several different ministries involved. 95 per cent of chrysotile asbestos entering India comes from countries like Canada, which have a "No Home Use Policy" in their own countries! Chaotic and confused are the adjectives that best describe the responses of the various departments of the government of India.

**Labour Ministry:** There are about 100,000 people engaged in the asbestos industry. Experts fear that world over, 550,000 people will be affected by asbestos-related diseases in the next 10 years; 240,000 of these will be in India alone. There is going to be a steady rise in the frequency of asbestos-linked cancers until at least 2010 or 2020 because it takes years to manifest itself. Any level of exposure can increase the risk of developing lung cancer.

**Consumer Affairs Ministry:** Occupational health experts called for banning asbestos at a meeting of the Bureau of Indian Standards (BIS) on February 18 and 19, 2003 on the grounds that there is no such thing as 'safe asbestos', contrary to the industry's claims. The Bureau of Indian Standards seems to be a misnomer for Bureau of Indian Guidelines. BIS comes under Consumer Affairs Ministry and, according to the Secretary to that Ministry, BIS standards are just guidelines, which are not mandatory.

**Ministry of Commerce and Industry:** Following the WTO Appellate Body's order on March 12, 2001 validating the rights of Member States to prohibit the import and use of carcinogenic substances such as chrysotile, the Union Ministry of Commerce appointed a technical committee to go into the legalities involved. There was considerable fear that asbestos would become the second environmental issue to come before the WTO after the turtle-shrimp case. The committee considered various aspects of asbestos exposure, in the industry and mines as well as to the public from asbestos products. The committee also considered restrictions on asbestos and asbestos products by various countries. In its report in January 1995, the committee came to the conclusion that there were no prohibitions or restrictions on the use of asbestos related products in India. What is required of the Ministry of Commerce and Industry is to amend its export and import policy to prohibit the import of white asbestos.

The sheer number of ministries involved in the issue of the import and effects of white asbestos, together with a marked callousness on the part of the Ministries of Environment, Labour, Consumer Affairs, Health, Mines, Commerce and Industry make it difficult to get any straight answers or commitments.

### **Proof Positive**

There are numerous Indian studies that have illustrated the hazards of asbestos exposure. The environmental monitoring data in Beawer and Deogarh of Rajasthan, in the milling or grinding units showed that fiber concentration was very high, workers do not use gloves, masks or protective clothing. They use a primitive manual method of grinding. The fiber concentration found was 2-18 fold higher than the Indian standard of 0.5 fiber/cc. It was also observed that in these units not only workers but also infants and children were exposed to high amounts of asbestos as they were found to be playing on the heaps of asbestos. In the organized sectors the levels of fiber concentration were low but housekeeping was quite poor.<sup>17</sup>

Clinical studies conducted in both types of units revealed significant lung function abnormalities among the factory workers. Further, the lung function tests among female workers in the unorganized sectors showed more deteriorated conditions than for males, which could be due to the exposure to both unprocessed biomass fuel, domestically and asbestos fibers, occupationally. Radiological examinations revealed a large number of cases of asbestosis in both organized and unorganized sectors. The prevalence of asbestosis in less than five years is very high and alarming. Asbestos bodies in the sputum of workers were detected as a mark of exposure. Cytogenetic analysis revealed a higher level of micronuclei formation in the blood of the workers which is a biomarker for cancer.

Dr. S.R. Kamat, Professor of Respiratory Medicine and Chief, Environmental Pollution Research Centre, K.E.M. Hospital and Seth G.S. College, Mumbai, says, "We studied the X-rays of 789 asbestos workers exposed to asbestos during processing of asbestos. 2.4 per cent showed lung scarring due to T.B. and 36.6 per cent showed abnormalities due to asbestos. We have studied 91 asbestos cases with moderate to advanced lung deposits. Most symptoms show up after a mean exposure of 13 years, with various respiratory complaints and restrictive lung functional disability. Certainly, this industry has a large respiratory disability."

According to a paper entitled *Present Status of Asbestos Mining and Related Health Problems in India – A Survey* by A.L. Ramanathan and V. Subramanian published in the Industrial Health Journal in 2000: "In India, asbestos raw material is received from Canada without any warning and India sends back the finished product to them along with a warning. In India, workers slice open the bags of Canadian asbestos with knives, then shake the bags into troughs and mix it with cement to make piping. The unprotected workers are completely covered in asbestos dust, and there are absolutely no precautions in place."

In a survey of U.P. Asbestos Limited, Mohanlalganj, Lucknow and Allied Nippon Pvt Ltd., Gaziabad, (U.P) lung function impairment was found to be higher in subjects exposed for more than 11 years. This was the result of a Central Pollution Control Board sponsored project entitled "Human risk assessment studies in asbestos industries in India."<sup>18</sup>

Taking cognizance of asbestos-related diseases, the Indian Association of Occupational Health (IAOH) passed a resolution in April 2002 seeking a ban on the use of all forms of asbestos.

Researchers at the National Institute of Occupational Health (NIOH), an Ahmedabad-based autonomous government scientific body, have found lung impairment and radiological abnormalities in asbestos milling workers (54.8 per cent) and miners (19.5 per cent). The workplace asbestos fibre concentration in milling facilities was found to be 33 times higher than the Indian standard for chrysotile asbestos of 2 f/cm<sup>3</sup>. Besides, mesothelioma, a cancer of the thin membrane enclosing the lungs, which is caused by asbestos exposure, has been reported in India.<sup>19</sup>

Indian researchers have reported numerous instances of high exposure levels to asbestos fibres in the workplace, which indicates a potential epidemic-like situation of asbestos-related diseases in the coming years. But due to the lack of a sophisticated mortality and morbidity data collection system, it has been difficult to comprehensively illustrate the prevalence and incidence rates of asbestosis, mesothelioma and other asbestos related illness in India. But surely lack of data does not prove that the danger does not exist. The Indian asbestos industry uses this as an excuse to continue to promote its dangerous operations. This is evident from the fact that, through its influence within the corridors of power of the Indian political system, it has managed to bring down the import duty on asbestos from 110 per cent in 1992 to 50 per cent, thus reducing total import cost by 25-30 per cent.<sup>20</sup>

According to a study conducted by the Institute of Public Health Engineering (IPHE), an estimated two million workers in the United States will die from workplace exposure to asbestos, though the standards for manufacture there are 20 times more stringent than in countries such as India. “The profound tragedy of the asbestos epidemic is that all illnesses and deaths related to asbestos were entirely preventable by not using asbestos. The threat to health was known and alternative viable substitutes were available,” the IPHE report notes.

A scientific paper titled “Carcinogenicity of asbestos: Convincing evidence, conflicting interests” states, “A look at the history of corporate activities in asbestos-related research reveals a disturbing trend. Information that was made available, through legal interventions, clearly shows how for half a century the asbestos industry in collaboration with some academic leaders of occupational medicine successfully suppressed evidence against asbestos.”<sup>21</sup>

## **Asbestos & Judicial Action**

### **Indian judiciary takes cognizance asbestos hazards**

The Supreme Court established the effects of asbestos and the risk beyond the workplace in the Consumer Education and Research Centre (CERC) vs Union of India case in 1995. According to the report of the National Commission to Review the Working of the Constitution, the court has in this case, held that the Right to Health is a fundamental right.

The six Supreme Court directions in the CERC case are:

- a) to maintain health records of all workers for forty years,
- b) to use membrane filter tests at the workplace at all stages,
- c) to insure health coverage with Employees' State Insurance Act or otherwise,
- d) to review permissible exposure limits,
- e) to protect workers from health hazards in small-scale factories and
- f) to apportion compensation of Rs 100,000 to the affected.

The Court held as under:

“It would thus be clear that disease (related to asbestos) occurs wherever the exposure to the toxic or carcinogenic agent occurs, regardless of the country, the type of industry, job title, job assignment, or location of exposure. The disease will follow the trail of the exposure, and extend the chain of carcinogenic risk beyond the workplace. It is the exposure and the nature of that exposure to asbestos that determines the risk and the disease, which subsequently result. The development of the carcinogenic risk due to asbestos or any other carcinogenic agent, does not require a continuous exposure. The cancer risk does not cease when the exposure to the carcinogenic agent ceases, but rather the individual carries the increased risk for the remaining years of life”.

Unfortunately, despite the apex court's order of 1995, victims continued to suffer in anonymity after this. It was expected that the Indian Government would take stringent measures to curb the menace but actually no action was taken and, according to the statistics, the consumption of asbestos has increased after the judgment, as has the number of production units and so also the hazards and deaths.

Currently, health records of workers are generally not being maintained. The number of workers is shown on a contract basis and the duty of keeping records is shifted to the contractor who does not keep records.

In a handful of companies, the membrane filter test to detect asbestos fibre is done. In others, – more than three hundred units – the practice is not known to the owners or to the workers.

There has been no serious move, so far, to ensure that small-scale factories or industries protect their workers from the health hazards experienced in the manufacture of asbestos or its ancillary products.

The amount of compensation is very low. The legal expenses needed to get compensation are high that workers prefer to get a Rs.10, 000 (\$ 218) payment from the owner and a job for a relative to replace him in the same factory in the same atmosphere.

On 12 July, 2004, the Supreme Court issued notices to the Government of India and the States of public interest litigation that seeks a ban on the import, manufacture and use of asbestos, due its carcinogenic effects.

### **WTO Order on Asbestos**

The World Trade Organization (WTO) verdict which validated the rights of Member States to prohibit the import and use of goods, which contain carcinogenic substances such as chrysotile, was delivered on March 12, 2001 by the WTO's Appellate Body (AB). It was issued in the case of Canada vs. the European Communities. AB Judges Florentino Feliciano, James Bacchus and Claus-Dieter Ehlermann confirmed that chrysotile is an established carcinogen, that there is no safe threshold and 'controlled use' is not an effective alternative to a national ban. India had joined a vast majority of WTO members in protesting against the AB's decision to invite amicus curiae (friend of the court) briefs (private individuals/agencies) in the case.

It is scandalous that India, Pakistan and Egypt, among others, made such strong protests when the AB announced that it would consider written submissions by NGOs, arguing that their influence as member countries would be diminished by NGO participation. India's Ambassador to the WTO, S. Narayanan made it clear that India did not regard this issue as a procedural one, as viewed by the AB but a substantive matter in which the AB's approach was totally 'unjustified.' Narayanan stridently proclaimed that the Appellate Body's approach to accept unsolicited briefs and submissions from any source amounted to changing the inter-governmental character of the WTO.

In more recent times as per a discussion regarding regulation of imports of asbestos and its products at the Indian Commerce Ministry, the Directorate General of Foreign Trade (DGFT) was worried about the possibility of asbestos being the next big issue at the WTO. The corporate lawyers have explained to the Government the origin of the problem and issues, which are involved with regard to imposing restrictions on the import of asbestos. The lawyers informed the Ministry that the origin of the problem was the WTO upholding of the French decree prohibiting manufacture, processing, sale and import of asbestos.

### **International Law**

The international law on right to health of citizens has emerged. Import of asbestos waste is banned in India as a consequence of the Basel Convention through Hazardous Wastes (Management and Handling) Amendment Rules, 2003.

### **Victims' Plight**

With diagnosable asbestosis among workers in most asbestos factories and mines, consumer products with no warning labels and unions with no programmes to prevent asbestos disease and exposure in builders and mechanics, India is an asbestos time bomb already exploding. There are thousands of disabled workers deserving of compensation. There is visible asbestos

dust in ubiquitous construction sites. There are still plants importing asbestos to make textiles (despite Canada's assertion to the WTO that they don't sell asbestos for "friable" use).

Due to the ignorance of common people and especially the asbestos industry workers the level of asbestos related diseases is increasing rapidly. According to a recent issue of the International Journal of Occupational and Environmental Health estimates by the Chennai-based Cancer Research Institute suggest that 3-4 % of all lung cancers in India are asbestos related. Successive governments in India have promoted this killer mineral fiber contrary to public health.

It has been revealed during surveys and studies that:

- most of the workers were suffering from asbestos related diseases like asbestosis, mesothelioma, and lung cancer;
- no health records were kept over the years;
- if any worker was found to suffer from any of the diseases, he was either discharged from service with a small cash compensation or his health record was manipulated to show him as a healthy person.

It has also been noted that, every year, asbestos factories in India engage migratory labourers in their units, possibly intentionally. It is very difficult to either keep a track of or identify such labourers. Considering the long latency period of asbestos diseases the fate of such workers can well be imagined.

International scientists and physicians are very much concerned about the growing use of asbestos and ship-breaking industry in India. Nearly half of all ships scrapped worldwide are broken down in India. Each ship contains about 7.5 tonnes of asbestos, which is resold to manufacturers in India. In every national and international conference on asbestos, conditions prevailing in India are discussed.

As per the Economic Times special feature dated 4 November, 2003, around 30,000 workers are directly employed in asbestos factories and over 100,000 workers are involved indirectly. In the asbestos case discussed earlier the number of asbestos workers was said to be 10,000. The Court should ask the manufacturers to produce 20-year medical records for the 30,000 workers now reported to be employed in the industry. The special feature appeared in many other newspapers.

Asbestos manufacturers are openly advertising in newspapers, magazines, and journals, with financial help from Canadian asbestos fibre exporters, declaring chrysotile asbestos to be safe. How the Union of India are allowing a class 1 carcinogen to be declared safe through advertisements is another question the petitioners would like to put.

Such advertisements spread wrong information and misleading propaganda. The situation has become very alarming. The workers are not even aware that strict precautions should be taken to avoid hazardous exposure to chrysotile asbestos. It is because of this ignorance that the workers suffer from deadly asbestosis and often are not even aware of the nature their

medical condition. In the handful of organizations where medical examinations are undertaken, the workers are not told why their check-ups are being done and the results of the check up are not revealed to them. The manufacturer or the employer also does not disclose such information to the Labour Union or authorities.

Deliberate business decisions, not technical difficulties, are the cause of today's continued high usage of asbestos in India. The politics of phasing out asbestos are made more difficult. The Indian Government refuses to learn any lessons by observing that the world's largest exporter of chrysotile asbestos, Canada, consumes only 1 percent of the asbestos it mines. Canadian construction workers would not work with asbestos cement construction materials, so these products are not made at all in Canada

It is important to note that foreign-owned asbestos companies in India are selling out, due to fear of compensation cases being brought in other countries by Indian victims. All the foreign companies (Johns Manville, Turner & Newall and Eternit), which were operating in India have withdrawn and sold their interests to Indian companies. More than 60 multinational companies in the USA alone have become bankrupt because of asbestos claims; therefore every other company has made efforts to get out of the asbestos business. The foreign companies are afraid of compensation claims from Indian victims in the countries of their origin. However, Indian asbestos companies remain callous towards workers and common people and are increasing their production. They are buying the foreign interests in India.

### **Status in Indian States**

The expansion of the asbestos based friction material manufacturing unit in Virudhunagar district in Tamil Nadu was accorded environmental clearance on March 5, 2003 as was the setting up of the asbestos cement roofing sheet and accessories manufacturing unit in Midnapore district of West Bengal. Rajasthan has rich deposits of asbestos. Andhra Pradesh has the largest deposits of quality chrysotile asbestos in the country. A large number of mineral based plants including those producing asbestos products are located in various parts of Maharashtra, according to Minister of State for Coal & Mines, Dr. Dasari Narayana Rao in a written reply in the Lok Sabha on August 25, 2004.

### **Regime Changes but Order Remains Same**

After the Bhartiya Janata Party led National Democratic Alliance (NDA) lost in the election, the Congress led United Progressive Alliance (UPA) is now the ruling alliance. The UPA is supported by leftist parties which are part of the coalition but from outside. Although the promise of better health to citizens was made, the asbestos trade continues irrespective of the change in the regime. Now the possibility of a lifting of the ban on asbestos mining is all the more alarming.

Recently, concerned ministries have been briefed by the industrial houses that since the Rotterdam Convention does not mean a ban on asbestos, there is no harm in signing and ratifying it, since India cannot afford to stand in isolation on the issue of Prior Informed Consent for trade controls on asbestos.

## **BANI's Work**

Since its formation in 2002, Ban Asbestos Network of India (BANI) has brought the attention of the media and parliament to the global movement to ban asbestos with little success in terms of making India asbestos free.

As part of its ongoing work BANI has expanded itself to include key environmental health, labour, academic groups and trade unions that have resolved to work for the safety of the asbestos workers. As a consequence, attention has been drawn to the use of white asbestos for water pipes or as roofing sheets in the construction industry. Now its use and probable consequences in the manufacture of pressure and non pressure pipes used for water supply, sewage, irrigation and drainage system in urban and rural areas, asbestos textiles, brake lining and jointing used in core sector industries such as automobile, heavy equipment, petrochemicals, nuclear power plants, fertilizers, thermal power plants, transportation, defence, etc., are being recognized.

The following resolution and a joint statement (in italics), which has been published in Labour File, a bimonthly journal of labour and economic affairs published in Delhi underline the current efforts of BANI.

*Adopted at National Conference on Workers Plight and Status of White Asbestos Trade, held at India International Centre, New Delhi, November 8, 2004*

*Medical doctors, scientists, trade union representatives, academics, NGOs, social activists, lawyers, and other civil society organisations assembled at the India International Centre, New Delhi on November 8<sup>th</sup>, 2004, for a national conference on asbestos,*

*Viewing with deep concern the increasing trade and use of asbestos in various industries in spite of the existence of ILO Convention on Asbestos, 1986, the Basel Convention, 1989, the IPCS/WHO – EHC 203 on chrysotile asbestos, 1998, as well as the Supreme Court judgement of 1995, total ban of asbestos in about 40 countries.*

*Acknowledging that viable alternatives to asbestos do exist,*

*Affirm based on scientific studies and clinical evidence that asbestos in all its varieties is carcinogenic.*

*Recognise that asbestos is hazardous to human health and environment.*

*The meeting agrees that the use of asbestos should be phased out and banned.*

*The group recognized the other civil society networks and movements including those engaged on Right to Information, Right to Food, Right to Employment and Livelihood, Right to Health and will interact with them to include them in the movement against asbestos. It took note of the need for medical literature in vernacular languages for wider information dissemination.*

*The group condemns the false information put out by the industry and its sponsored agents, to misinform and confuse the public about the hazards of asbestos in particular chrysotile,*

*Further, the group is open to dialogue and interact with the Government and the industry to further the cause of worker and citizen's health.*

*In order to achieve the above the following specific measures are recommended;*

- *Government of India should ratify the ILO convention on asbestos immediately*
- *Government to ban import of asbestos in all forms in particular white asbestos (chrysotile)*
- *Government to ban all asbestos mining, use, trade and other indigenous activities*
- *Condemn the custom duty concessions with immediate effect*
- *Government to establish an effective infrastructure to detect illness caused by asbestos and ensure compensation for affected people by establishing the liability of the employers and alternative employment.*
- *Ensure health surveillance and availability of medical literature in vernacular languages*
- *Call upon the government to synchronise all laws so that hazards of asbestos can be clearly articulated.*

*The participants resolve to form a Steering Committee and a broader Joint Action Committee with the objective of mobilising public opinion against the use of asbestos and work towards its total ban.*

In recent times BANI has helped raise the voice of protest against the import of ships containing asbestos waste for ship-breaking in any Indian shipyard. Also it is keeping track of moves afoot to scrap the SS Norway, the vessel, built as the SS France some 45 years ago. Large ships like The Clemenceau, a French ship, Fredrik, a Danish ship and SS Norway are sent to scrap yards where the vessels are dismantled by hand. The ships are hauled up onto the beach where unskilled manual labourers cut them apart. Such ships contain asbestos and other hazardous substances.

### **Available Alternative Solution**

In banning asbestos questions arise on how to provide substitutes for asbestos, rehabilitation packages and alternative employment for workers. There are many long-established alternatives to chrysotile, which do not rely on fibre technology. For example, steel sheeting can be used instead of asbestos cement sheets. Several types of non-asbestos fibres developed for use in a wide range of products can also be substituted for asbestos. The main non-asbestos fibres in current use are PVA, aramid and cellulose. A considered scientific view on their safety has recently become available. There is an urgent need to set up a Mesothelioma Register to take stock of asbestos victims.

With developed nations banning and phasing out asbestos, developing countries like India have become the dumping ground for asbestos from countries like Russia and Canada. The Ministry of Agriculture is sponsoring the Central Building Research Institute's (CBRI) research into alternative vegetable fibres and wastes as reinforcements for fibre-cements. The CBRI has developed roofing tiles and blocks using coir fibre and cement. These can also be used in place of asbestos by developing cement-building materials incorporating by-products of oilseeds, pulses and maize.

### **Need for Policy Watch**

Citizens of India wonder why the Indian Government is safeguarding foreign corporate interests instead of Indian health. Policymakers must draw a distinction between personal idiosyncrasy and incorporation of new economic and social policies in the face of indisputable medical evidence against white asbestos.

The rampant violation of the citizens' and workers' right to healthy life and natural justice requires a vigilant citizens' network. There is need for an urgent investigation into why the Indian policymakers sold themselves to the ideology of asbestos interests undermining the democratic rights of India's citizens.

### **Conclusion**

It is high time that the import of asbestos and asbestos usage is banned in India and legal proceedings initiated, including criminal prosecutions of all those responsible – the factory owners, promoters, organizations and associations – for the infringement of the natural right to a healthy life; India's asbestos victims deserve no less.

---

### **References**

<sup>1</sup> Barry Castleman, Industrial Hazards Exported to India, June, 1981, Economic and Political Weekly

<sup>2</sup> *The Hindu Business Line*, September 24, 2004

<sup>3</sup> Gopal Krishna, *Ecologist Asia*, 2003

<sup>4</sup> <http://exim.indiamart.com/sic-codes/sic-code2-3292.html>

<sup>5</sup> [http://www.infochangeindia.org/agenda1\\_15.jsp](http://www.infochangeindia.org/agenda1_15.jsp)

<sup>6</sup> [http://www.ijoe.com/pfds/0903\\_Dutta.pdf](http://www.ijoe.com/pfds/0903_Dutta.pdf)

<sup>7</sup> [http://www.financialexpress.com/fe\\_full\\_story.php?content\\_id=90142](http://www.financialexpress.com/fe_full_story.php?content_id=90142)

<sup>8</sup> <http://www.exportersindia.com/india/merchant-exporters/a/asbestos-and-asbestos-products.htm>

<sup>9</sup> [http://www.dgfasli.nic.in/newsletter/jan\\_march\\_96.pdf](http://www.dgfasli.nic.in/newsletter/jan_march_96.pdf)

<sup>10</sup> [http://www.dgfasli.nic.in/newsletter/apr\\_june2004.pdf](http://www.dgfasli.nic.in/newsletter/apr_june2004.pdf)

<sup>11</sup> INDOSNEWS, Ministry of Labour, July-September, 2004

<sup>12</sup> Dr Qamar Rahman, personal communication, February 2005

<sup>13</sup> <http://pib.nic.in/release/release.asp?relid=8882>

---

<sup>14</sup> <http://www.newindpress.com/NewsItems.asp?ID=IEA20050504075344&Topic=0&Title=ORISSA&Page=Q>

<sup>15</sup> <http://www.newindpress.com/NewsItems.asp?ID=IET20050509113553&Page=T&Title=Southern+News+++Tamil+Nadu&Topic=0>

<sup>16</sup> Asbestos - a ticking time bomb, Gopal Krishna, The Ecologist Asia, Vol. 11 No. 2

<sup>17</sup> Dr Qamar Rahman, personal communication, February 2005

<sup>18</sup> Reported in the Annual Report of ITRC (2001-2002) (India)

<sup>19</sup> T K Joshi, 2003, International Journal of Environmental Health

<sup>20</sup> D C Sharma, 2002, The Lancet

<sup>21</sup> National Medical Journal of India January-February, 2001