

The Blighted Hills of Roro, Jharkhand, India: A Tale of Corporate Greed and Abandonment

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In the Chaibasa region of the West Singhbhum district of Jharkhand, India, an abandoned chrysotile asbestos mine is a health scourge for villagers and former mine workers. A massive pile of asbestos waste mixed with chromite has lain atop the hilltops of Roro village for two decades, gradually seeping into the land, water, homes, and bodies of the tribal communities living at the foothills of Roro. To investigate the status of the asbestos waste and its impact on the community and the environment, a fact-finding team made a preliminary assessment. Its findings suggest that the careless closure of the mines and the unscientific disposal of toxic asbestos and chromite waste by the mining company pose a serious threat to the health of the local community and the environment. The preliminary health survey of 14 villages around the Roro hills, with 45% of the respondents being former workers of the Roro asbestos mines, indicates a highly probable link between the asbestos exposures and several adverse health effects such as low back pain, dyspnea, hemoptysis, and blindness. *Key words:* asbestos; Roro; Jharkhand; abandoned mines; toxic waste.

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Situated in the eastern part of India, Jharkhand is a new state carved out of the southern region of the erstwhile state of Bihar. It spreads over the Chotanagpur plateau, which has almost 40% of India's mineral deposits. Mineral deposits in Jharkhand include apatite, asbestos, chromite, manganese ore, kyanite, barytes, bauxite ore, china clay, copper ore, fire clay, feldspar, mica, graphite, iron ore, coal, limestone, dolomite, ochre, quartz/silica sand, garnet, granite, steatite, talc, titanium, uranium, and vanadium. It is one of the leading producers of coal (25%), silver (23%), iron ore (16%), copper ore (7.6%), mica (25%), kyanite (90%), gold (18%), bauxite (18%), graphite (10%), and dolomite (9%) in the country.¹

Recently, the government of Jharkhand drafted an industrial policy to attract Indian and multinational companies to exploit its riches, especially in the mining and

energy sector. But in its frantic pursuit of development and economic gain, the state has overlooked the history of criminal negligence of the mining companies, which in their pursuit of profits have left behind degraded forests, toxic wastes, and poisoned communities.

The Roro mines are one such example of corporate greed. Twenty years ago, Hyderabad Asbestos Cement Products Ltd. (now known as Hyderabad Industries Limited) mined asbestos from this area to manufacture asbestos cement products, abandoning the mines when they became unprofitable. It is not known how much profit the company made from the asbestos produced from the Roro mines, but the current annual turnover of the company is about Rupees 3.2 billion (US \$67.4 million).²

The Indian asbestos cement products industry has 14 major players, with an estimated production of 14.60 lakh metric tonnes and sale of 14.05 lakh metric tonnes of asbestos products in 2001-2002, which represents 80% of the installed capacity of the industry.³

MINING HISTORY

Stretching from Moosabani in the South to Ramchandra Pahar in the north, the mining region of Jharkhand has been one of the most productive over the last century, with rich deposits of copper and uranium in the south, and magnetite, chromium, and asbestos in the north.

The Roro hill is located about 20 kilometers west of Chaibasa, the headquarters of West Singhbhum district of Jharkhand. Roro and its neighboring Joju area have a history of active mining operations spanning about seven decades. Initially, small local miners mined magnetite from different sections of the hill. The hill was mined for chromite for the first time by the Tata Iron Ore company, which has a steel plant and a charge-chrome plant in the region. After acquiring much richer chromium leases in the adjoining state of Orissa, Tata Iron Ore company relinquished its mining interests in the area to a mining company owned by the Birlas, one of India's largest business companies. The Birla company initially mined both chromite and asbestos, later confining its mining operations to asbestos. The Roro mines were closed down in 1983, when the company realized, after digging deeper into the mines, that the grade of asbestos was no longer desirable, therefore unprofitable.

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Often a playground for children to slide down the soft and powdery slopes of Roro hills, the asbestos wastes mixed with crushed rocks and other minerals on the slopes of the Roro hill. The asbestos waste is gradually moving into the villages, farms, and ponds at the foot of the hills. The white dusty track framed by trees was made by the wastes as they washed downward with each rainfall.



During its operations, the annual production from Roro mines was about 4 to 5 lakh tonnes. It was one of the largest asbestos mines in India and employed about 1,500 workers, mostly tribals.⁴ According to estimates by the Indian Bureau of Mines, there is still a recoverable reserve of 40,000 tonnes of asbestos present in Roro. Hyderabad Industries Limited now imports most of its asbestos from Canada. In fact, India now annually imports about 156,500 metric tonnes (MT) of asbestos from Canada, Brazil, Zimbabwe, and Russia.⁵

Before the asbestos mine was shut down, the company created labor unrest and trade union rivalry among the workers. It however put the blame for the unrest on trade union leaders, who had raised the issues of occupational safety, exposure, and health of the workers, to avoid paying compensation to the workers as well as to steer clear of any liability. After the closure, the company gradually shifted all of its effects—mining equipment, tools, and machinery—except the asbestos waste. And for the last two decades this massive pile of nearly 0.7 million tonnes of asbestos waste mixed with chromite-bearing host rock has menaced the Roro people.

In these 20 years, nobody—the local administration, the mines and safety department, or the mining company—bothered to assess the fate of the waste dumped improperly on top of the Roro hills. The process of abandonment may be similar to that of most mines in India, but in this case the health risks to humans and the environment are far greater, since both asbestos and chromium are known carcinogens.

To assess the impact of this abandoned asbestos waste, a fact-finding team was constituted by Mines, Minerals & People (MM&P), a national network of mining struggle groups, and the Jharkhandis' Organization for Human Rights (JOHAR), a human rights group, to do a preliminary investigation of the current

environmental and health situation of the surrounding villages.

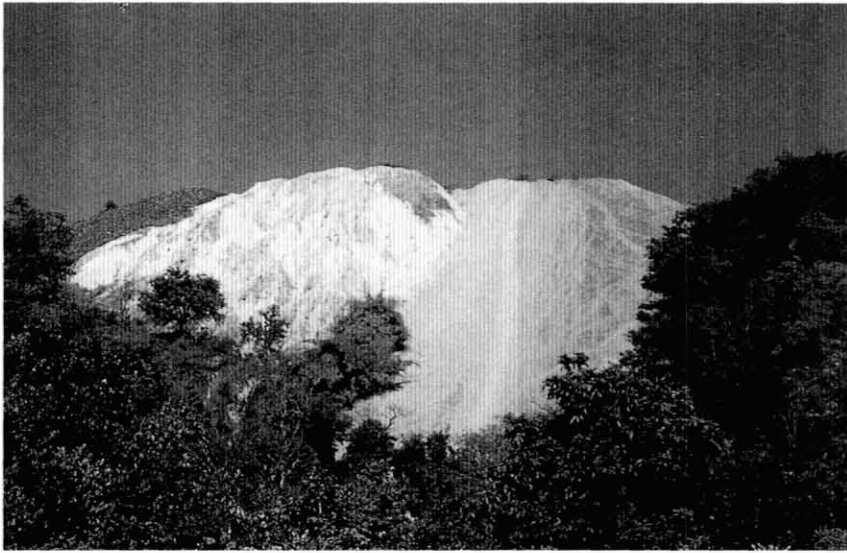
ENVIRONMENTAL IMPACT

The highest elevation of the Roro hill is approximately 600 meters above the level of the plains where the villages of Roro and Tilasud are located. The hill range, which is well wooded, is dotted with adits/tunnels (mine entrances), some of which are partially closed or filled. The highest adit is approximately 400 metres from the plains. In some cases, there are significant amounts of water trapped inside these adits or tunnels, which constantly flows down the hill slopes. Each adit has a dumpsite located next to it, where the company used to regularly dump dug-up rocks and asbestos and chromite waste along the sides of the slopes. Crushing and spinning units for asbestos fibers were located at two sites, one of which directly faces the Roro village and can be seen a few kilometers from the road.

The waste dumped at the highest point on the hill stretches across 100 meters. It is composed of ground host rocks—serpentines, clotted peridotites, and chromite-peridotite rocks—along with leftover asbestos. Dumping of boulders and finer materials for a prolonged period has changed the landscape of this section of the Roro hill range. The slope is beyond the angle of repose, but because of the low density of the materials has not snowballed into a slide downstream.

The waste has slipped several meters down the slope, spreading as a small alluvial fan into the paddy fields downhill. About 40-cm thick silty waste of crushed rocks is spread over the paddy fields.

During each monsoon, the waste from the dumpsites gradually runs off into the villages, fields, streams, and ponds located at foothill. According to the villagers, in the summer, warm winds carry fine waste



Asbestos-clad peaks of Roro hills, Chaibasa, Jharkhand. This asbestos dump on top of the hill was the asbestos milling site of the mines.

material from the dumpsites across the whole area. Of particular concern is the exposure to children and the elderly, who often walk through the waste dumps to graze animals in the thickly forested higher region of the hill. Children play in the dumpsite by sliding down the slope over the soft waste material, raising dust clouds of lethal asbestos-mixed wastes. Still more alarming, the children often try to burn the "magic" material, which does not easily catch fire. All of these exposures can cause serious long-term health damage to the children. Interestingly, although the hills are well wooded, there are hardly any worms, birds, or insects in the area.

VIOLATIONS OF LAW

Testimonies of former workers in the mines and the crushing plant as well as old newspaper reports indicate that the company had had scant regard for safety regulations, occupational health, or environmental protection. Although the mines were being operated before some of the critical environmental regulations had been enacted, yet the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981, were already in place before the closure of the mines. Also in existence were Mines Act, 1952, Mines Rules, 1955, Mineral Concession Rules, 1960, and Metalliferous Mines Regulations, 1961, which obligated the mine owners to operate the mines without compromising the health and safety of the workers. But clearly, the company had flouted even the most rudimentary of these regulations.

The most glaring labor-rights violation by the company was the non-payment of workers' dues under the Employees Provident Fund and Miscellaneous Provisions Act (1952). This fund, in which both the worker and the company contribute a percentage of the worker's salary

every month, is handed over to the worker on his or her retirement. It is a lifetime saving for a worker.

HEALTH IMPACT

Initial interviews with the ex-workers of the Roro mines from Roro and Tilaisud villages, two of the villages most proximate to the abandoned mines on the foothills of Roro, revealed that several people complained of low back pains, reduced vision, and respiratory symptoms, including hemoptysis. It is quite likely that workers who were apparently healthy attended these initial interviews. Hence, the healthy-worker effect (i.e., in an occupational setting, absence of workers too sick to attend interviews and over-representation of workers who were less sick) cannot be ruled out under the circumstances. Subsequently, the local groups JOHAR and MM&P carried out an indicative health survey of the area.

METHOD OF HEALTH INVESTIGATION

A population-based cross-sectional health survey ($n = 252$) of people in 14 villages surrounding the Roro hills was conducted. The questionnaire was drafted after several rounds of consultations with the local stakeholders in the area, using closed-ended items. The questionnaire was translated from English to the local languages after several iterations of forward and backward translations. It was administered by trained interviewers. One respondent was selected randomly from a household where the interviewers visited. Each household in turn was randomly selected from within the village.

FINDINGS

About 85% of the respondents were less than 70 years old, about 50% were men, about 45% were smokers,

and about 54% reportedly consumed alcohol at the time of this interview. More than 45% of the respondents reported that they had worked at the asbestos mines (N = 114). About half of the respondent population complained of low back pain (49.6%, *n* = 125), about one in six respondents complained of dyspnea (17.5%, *n* = 44), one in 14 respondents complained of hemoptysis (7.1%, *n* = 18), one in 12 complained of deafness (7.5%, *n* = 19), and over one in every five respondents (22.6%, *n* = 57) complained of total or partial blindness (Table 1).

TABLE 1. Key Variables Included in This Study

	No.	%
Age (years)		
< 50	80	31.7
50-59	63	25.0
60-69	70	27.8
70-79	25	9.9
≥ 80	13	5.2
Missing	1	0.4
Gender		
Male	128	50.8
Female	124	49.2
Smoking Status		
Smoker	114	45.2
Never-smoker	128	50.8
Ex-smoker	10	4.0
Alcohol intake status		
Consumes alcohol	136	54.0
Never consumed alcohol	110	43.7
Ex-user of alcohol	6	2.4
Worked in mines		
Yes	134	53.2
No	117	46.4
Missing	1	0.4
Worked in asbestos mines		
Yes	114	45.2
No	133	52.8
Missing	4	1.6
Low back pain		
No	125	49.6
Yes	125	49.6
Missing	2	0.8
Difficulty of breathing		
No	206	81.7
Yes	44	17.5
Missing	2	0.8
Coughs blood with sputum		
No	232	92.1
Yes	18	7.1
Missing	2	0.8
Deafness		
No	231	91.7
Yes	19	7.5
Missing	2	0.8
Blindness		
No	193	76.6
Yes	57	22.6
Missing	2	0.8

TABLE 2. Relationships between Independent Variables and Low Back Pain

	Low Back Pain No. (%)	Significance
Age (years)		0.50
< 50	35 (43.75)	
50-59	31 (49.21)	
60-69	37 (54.41)	
70-79	14 (56.00)	
≥ 80	8 (61.54)	
Gender		0.80
Male	64 (50.79)	
Female	61 (49.19)	
Smoking status		0.90
Never smokers	63 (49.61)	
Ever smokers	62 (50.41)	
Alcohol intake status		0.61
Never alcohol	52 (48.15)	
Ever alcohol	73 (51.41)	
Worked in mines		0.09
No	52 (44.44)	
Yes	73 (55.30)	
Worked in asbestos mines		0.56
No	65 (48.51)	
Yes	59 (52.21)	

The prevalence of low back pain was higher among the older age groups, and was increased among progressively with increasing age; it was also higher among alcohol users, and among those respondents who reported that they had worked at the mines, including asbestos mines (Table 2).

The prevalence of dyspnea was significantly higher among men, smokers, and those who reported that they had worked at the asbestos mines (Table 3).

The prevalence of self-reported hemoptysis was significantly higher among men, and among those who reported to have worked at the mines. The risk of self-reported hemoptysis was particularly higher among people who reported that they had worked at the asbestos mines (Table 4).

The prevalence of self-reported deafness was significantly higher among older age groups, alcohol users, and those who reported to have worked in mines. However, even though the prevalence of deafness was higher among people who reportedly had worked at asbestos mines, it was not significantly higher than that among those who had not worked at asbestos mines (Table 5).

The prevalence of self reported blindness was significantly higher among older age groups (70 years or older), men, smokers, and those who reported to have worked at the mines, including asbestos mines. The prevalence of blindness was about 30 per 100 population among those who reported to have worked at the asbestos mines (Table 6).

These findings suggest links between asbestos mining and several adverse health outcomes in this population, including low back pain, dyspnea, hemop-

TABLE 3. Relationships between Independent Variables and Self-reported Dyspnea

	Dyspnea No. (%)	Significance
Age (years)		0.758
< 50	13 (16.25)	
50-59	12 (19.05)	
60-69	11 (16.18)	
70-79	4 (16.00)	
≥ 80	4 (30.77)	
Gender		0.109
Male	27 (21.43)	
Female	17 (13.71)	
Smoking status		0.035
Never smokers	16 (12.60)	
Ever smokers	28 (22.76)	
Alcohol intake status		0.735
Never alcohol	18 (16.67)	
Ever alcohol	26 (18.31)	
Worked in mines		0.059
No	15 (12.82)	
Yes	29 (21.97)	
Worked in asbestos mines		0.009
No	16 (11.94)	
Yes	28 (24.78)	

TABLE 4. Relationships between Independent Variables and Self-reported Hemoptysis

	Blood in Sputum No. (%)	Significance
Age (years)		0.666
< 50	4 (5.00)	
50-59	6 (9.52)	
60-69	6 (8.82)	
70-79	2 (8.00)	
≥ 80	0 (0.00)	
Gender		0.016
Male	14 (11.11)	
Female	4 (3.23)	
Smoking status		0.124
Never smokers	6 (4.72)	
Ever smokers	12 (9.76)	
Alcohol intake status		0.380
Never alcohol	6 (5.56)	
Ever alcohol	12 (8.45)	
Worked in mines		0.029
No	4 (3.42)	
Yes	14 (10.61)	
Worked in asbestos mines		0.005
No	4 (2.99)	
Yes	14 (12.39)	

tysis, and blindness. Since these health outcomes were all measured using self-reported symptoms and were not validated using other means, they are open to information bias. Hence, a more comprehensive study is warranted to evaluate the associations between several health outcomes and work in the asbestos mines for this population.

TABLE 5. Relationships between Independent Variables and Self-reported Deafness

	Deafness No. (%)	Significance
Age (years)		0.001
< 50	1 (1.25)	
50-59	2 (3.17)	
60-69	9 (13.24)	
70-79	3 (12.00)	
≥ 80	4 (30.77)	
Gender		0.840
Male	10 (7.94)	
Female	9 (7.26)	
Smoking status		0.205
Never smokers	7 (5.51)	
Ever smokers	12 (9.76)	
Alcohol intake status		0.043
Never alcohol	4 (3.70)	
Ever alcohol	15 (10.56)	
Worked in mines		0.060
No	5 (4.27)	
Yes	14 (10.61)	
Worked in asbestos mines		0.883
No	10 (7.46)	
Yes	9 (7.96)	

TABLE 6. Relationships between Independent Variables and Self-reported Partial or Total Blindness

	Blindness No. (%)	Significance
Age (years)		< 0.001
< 50	6 (7.50)	
50-59	21 (33.33)	
60-69	13 (19.12)	
70-79	9 (36.00)	
≥ 80	8 (61.54)	
Gender		< 0.001
Male	41 (32.54)	
Female	16 (12.90)	
Smoking status		0.001
Never smokers	18 (14.17)	
Ever smokers	39 (31.71)	
Alcohol intake status		0.000
Never alcohol user	10 (9.26)	
Ever alcohol user	47 (33.10)	
Worked in mines		0.000
No	14 (11.97)	
Yes	43 (32.58)	
Worked in asbestos mines		0.011
No	22 (16.42)	
Yes	34 (30.09)	

CONCLUSIONS

It is amply evident from the preliminary investigations that the careless closure of the mines and the hazardous disposal of toxic asbestos and chromite waste pose a serious threat to the health of the local community and their environment. Moreover, the ex-workers

of Roro mines and their families, for whom dues were not paid to the retirement fund, have been reduced to penury due to loss of livelihoods. The farmlands close to the abandoned mines have also been completely or partially damaged by the waste flowing down the hill, but the farmers have no idea where to appeal for justice and demand compensation.

Old local newspaper clippings from *Singbhumi Ekta*, a weekly from Chaibasa, published between January and August 1981, include a press release from the late P. Mazumdar, the leader of the United Mine Workers Union (AITUC), which says that 30 workers from Roro mines had died of asbestosis. During the same period, the issue was also raised in the Indian Parliament by then-Member of Parliament Indrajit Gupta, but no action was taken against the industry.

By closing down the mines, the company absolved itself of all responsibilities. The fundamental right of a citizen to lead a healthy life, as laid down in the Indian Constitution, has been violated by the company. The company should be held liable for its actions, and the state government should be held accountable for not

ensuring protection of its people and environment, which is its primary duty.

The present investigation is an indicative study, which highlights the status of the waste and its possible impact on the people and environment. It is necessary to carry out a proper health and environmental study of the area, and draw a scientific plan for cleanup and disposal of the waste. But more importantly, the suffering villagers and former mine workers of Roro should be compensated for their loss of livelihood and health.

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