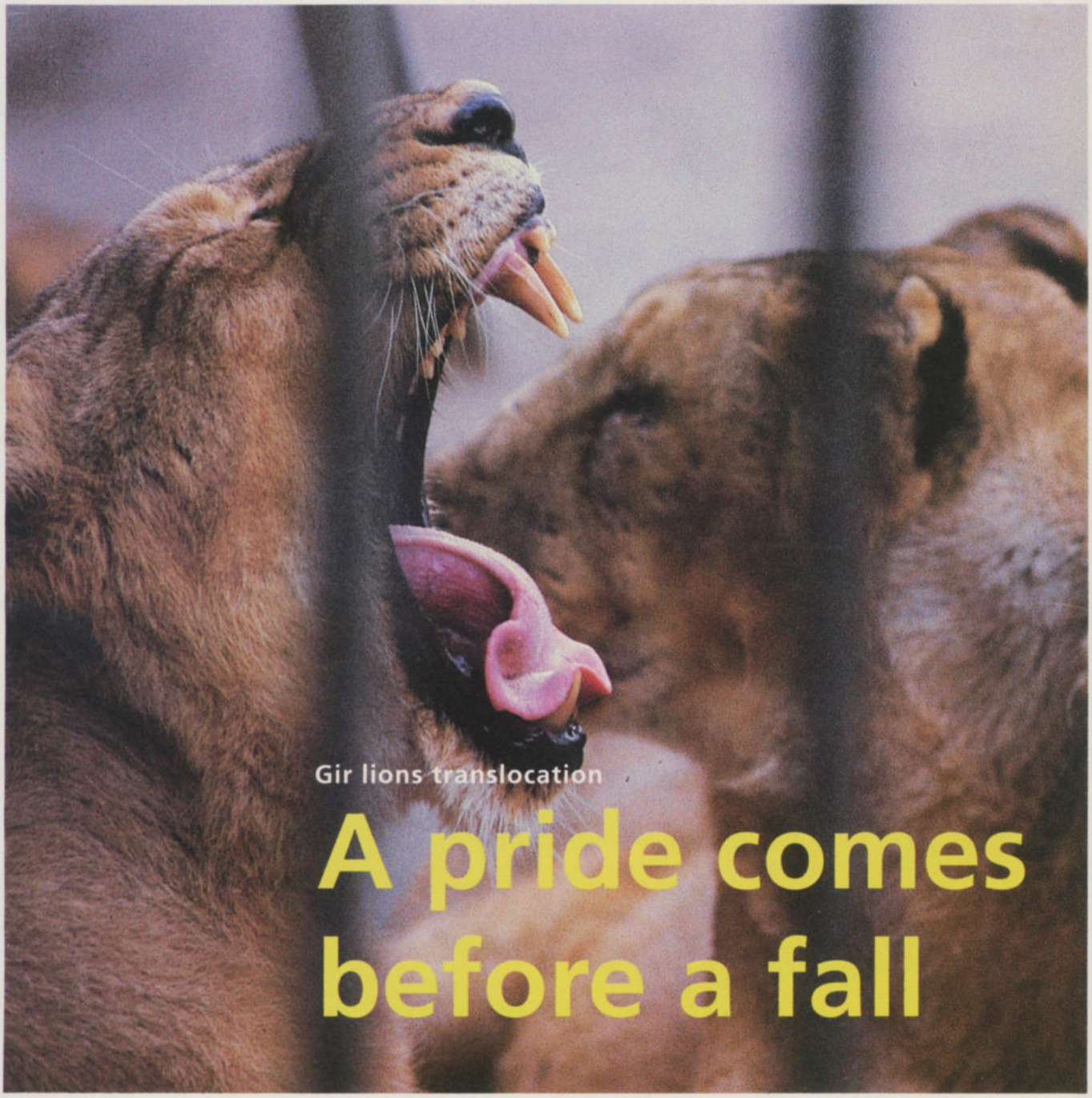
SCIENCE AND ENVIRONMENT FORTNIGHTLY

Down To Earth

FEBRUARY 28, 1995



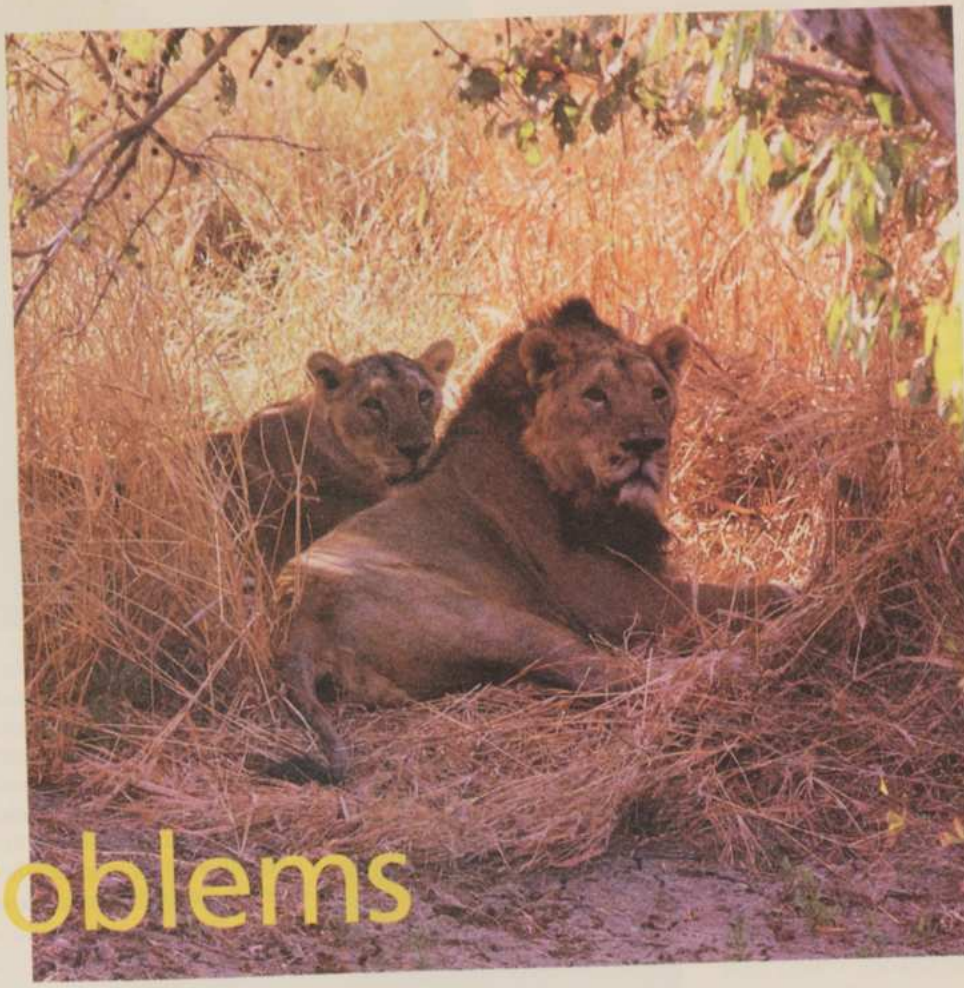
Gir lions translocation

A pride comes before a fall

New estimates of methane emissions from paddy fields

Death cargo: reprocessed radioactive waste back to Japan

World Wide Fund International: a house divided



PHOTOGRAPHS: ARVIND YADAV / CSE

Problems behind the pugmarks

Translocating some lions from Gujarat's Gir sanctuary — the home of the endangered Asiatic lion — to the Kuno wildlife sanctuary in Madhya Pradesh to save the big cat could mean people trouble. Residents of both areas sense that their lives will never be the same, reports RIMJHIM JAIN

The lion can be heard prowling at night, near the livestock enclosure. In the morning, we are woken up by blasting in the limestone mines surrounding the fields. The lion eats only when it is hungry. But the factory (the Ambuja Cement Factory beyond the mines) never stops eating.
— Residents of Navagam village, Amreli district, Gujarat

The forest will soon reverberate not to the roar of the lions but to the sound of the pickaxe and drilling machines. The land that sustains our cattle will turn bone white and the cattle will die.
— Maldharis in the Saddhebeda ness in Devalia, Gir sanctuary, Gujarat

Proposed schedule for the translocation of lions to Kuno sanctuary

Jan-Feb 1995

- Preparation for relocation and rehabilitation of the local people from the proposed national park area in Kuno with their consent
- Translocation of captured nilgai, sambar and other ungulates that are the prey for the lion

March-July 1995

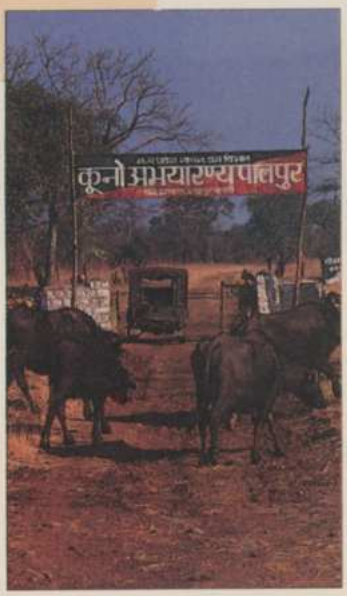
- Shifting of villagers from core areas of proposed park and starting rehabilitation work at the new sites
- Eco development programmes in villages in the park in order to enlist their support for the plan
- Placement of key forest staff in strategic areas of the park

July-November 1995

- Demarcation of core and buffer areas
- Placement of field staff in both areas
- Finalisation of legal and administrative arrangements for formation of park

Dec-Jan 1996

- Capture of lions and release in Kuno



ABOUT 1,000 km away from the Gir sanctuary, in the remote grasslands of the Sheopur forest division in Madhya Pradesh's Morena district, tribals have noticed an increase lately in the number of government vehicles. Their age-old suspicion of outsiders is vindicated when they discover that forest guards have warned the residents of Tiktauli village in the Sheopur forest division that they may all have to move out of the forest: an ambitious project to translocate part of the lion population from coastal Gir to the Kuno wildlife sanctuary in the Sheopur division is on.

To this land in central India, where the last lion was shot over 100 years ago, the beast is soon to be restored: this time, radio-collared and accompanied by high-tech gadgetry for its protection. The Central government project — conceived by researchers in the Wildlife Institute of India (WII), Dehradun — is meant to ensure the survival of the Asiatic lion, now balanced on the razor's edge of extinction.

Wildlife and people are now seen as mutually exclusive species, and resurrecting the lion here means emptying 700 sq km of about 7,500 forest-dwellers to form a national park. Local grassroots developmental organisations warn that moving out the Sahariyas from the forests could endanger the tribals' existence.

Adds Ahmedabad-based environment lawyer Girish Patel,

"For the protection of the lion, thousands of Maldharis living traditionally in the Gir forest area were evacuated by the government and reduced to penury. This pattern of injustice is to be repeated in Kuno."

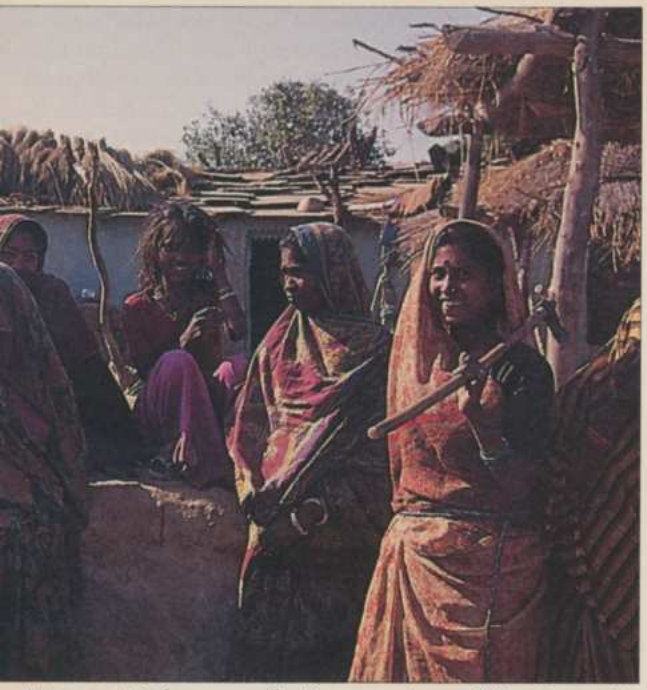
And in Gir, people's representatives say that the lion is seen as the only buffer for the protection of the forests. A reduction in its population, or reducing the importance of the forest as the last home of the Asiatic lion in the continent, could see the life-supporting forests being swallowed up by the growing mineral-based industry.

Big cat blues

There were only 20 Asiatic lions in the Gir forest at the beginning of this century. This fragile population has been nursed to nearly 300 today by a fiercely protective conservation strategy initiated by the Nawab of Junagadh in 1900 (see box: *Contentious conservation*).

"When all the members of an endangered species exist at a single site, the threats to their survival increase," says WII scientist Ravi Chellam in his report on the survey of potential sites for reintroduction of the Asiatic lion, submitted to the Union ministry of environment and forests (MEF) in December last year. Catastrophes such as an epidemic, fires or a cyclone, could seriously deplete or even wipe out the Asiatic lion population.

Inbreeding among the small surviving population makes the Gir lion more vulnerable to disease and genetic disorders. With the lions recently straying away from Gir and establishing small pockets in neighbouring areas like Junagadh's Girnar forest and the Mitiyala forest in Bhavnagar district, wildlife researchers feel that the sanctuary has reached the limits of its carrying capacity. They warn that an increase in the lion pop-



Women at Palpur, near the Kuno sanctuary: filling it up with lions will mean emptying the area of people

ulation could mean territorial quarrels among the beasts, who require home range sizes of about 150 sq km each, and also greater conflicts with humans as more livestock is killed and villagers mauled. "Establishing a second free-ranging population is thus amply justified," claims the WII report.

The translocation plan is now being put forward with speed (see box: *Proposed schedule...*). A core group comprising Union and state government authorities, WII experts and representatives of local NGOs and universities is being set up to monitor the translocation.

Out of several alternate sites, including 2 in Rajasthan, Kuno was selected because of its forest habitat, which closely corresponds to Gir — dry, deciduous forest and thorn savannah and relatively low human and livestock pressure.

The WII report states that portions of the 350 sq km Kuno sanctuary could be combined with the surrounding forest to form a 700 sq km national park. This implies relocating the 7,400 people living in 19 villages and a halt to livestock grazing in the area.

At a meeting held on January 11 in Bhopal between the state administration and MEF officials, a resettlement site near Agra village on the fringe of the sanctuary was discussed. Says L K Choudhary, divisional forest officer, Sheopur, "The relocation site has scanty forest growth so the villagers will be encouraged to practise agriculture."

For villages like Karahal, Panwara and Moraval that will fall in the proposed buffer zone which supports 15,000-20,000 people, Choudhary says, "To reduce the people's present dependence on the forest for grazing livestock, lifting wood and collection of minor forest produce, an alternate mode of livelihood will be developed by strengthening agriculture and imparting basic education to enable villagers to find better jobs elsewhere."

Troubled locations

Although eager to receive the lions, the MP government is anticipating trouble ahead. Says MP principal chief conservator of forests, N J Oka, in Bhopal, "Relocation will cost at least Rs 20 crore and there are sure to be protests from local NGOs."

Contentious conservation

The concern over protecting the Asiatic lion relegated forestdwellers to secondary status in Gir

Conflict between the local population in Gir and the conservation authorities can be traced back to the formation of the wildlife sanctuary in 1965. Revenue wastelands and grazing land on the Gir's periphery were declared reserved and protected forests without the villagers knowledge.

This land was previously kept outside the main block of reserved forest by the Nawab of Junagadh in order to service the needs of the local people. The government declared a total area of 1900 sq km falling in both Junagadh and Amreli districts of Gujarat as the Gir protected area.

Further widespread resentment was caused when, following studies carried out by international conservation organisations such as the World Wide Fund for Nature in the '60s, the Union government was directed to prevent degradation of Gir forests and its lions by moving out the Maldharis and their livestock, considered the major culprits.

In 1972, the state government launched the Rs 45 lakh Maldhari rehabilitation scheme and of over 845 Maldhari families residing in 129 nesses (Maldhari settlement) inside Gir, 580 families were resettled outside the protected area.

While the core area comprising the national park contains no human population, 54 nesses with 2,500 people and about 1,000 livestock still live inside the sanctuary. Another 4,500 people live in 14 forest settlement villages in the sanctuary.

Shankar Narayanan of the Gujarat Ecology Commission points out, "It is ironical that while foreign expertise was sought on how to save the lions, the rationale behind converting 500 Maldhari farmers who have been cattle rearers for generations, into agriculturists overnight was not questioned." Without training facilities, most relocated Maldhari families failed in agriculture. With the forced reduction in cattle population, incomes declined and the Maldharis began working as contract labourers or as agricultural workers in other farmers' fields.

Other points of contention in the area include raiding of crops by the growing population of herbivores and lion attacks on livestock and humans, a long standing problem. Despite the conflict with the beast, Karamta of Saddhebheda ness adds, "Seeing the lion a few times a year is considered auspicious."

Preparing the jungle for its king

The introduction of the lion to the Kuno forests has been meticulously planned

Intensive management of Kuno forests is required before lions can be introduced in the area, claim Wildlife Institute of India researchers. Because the population of herbivores such as chital, nilgai, sambar and blackbuck is too low to sustain the lions, it is planned to introduce over 5 years 500 of each of these species in the area.

About 5-7 adult lions taken from a single pride would be translocated. The capture, transport by road or possible airlifting and release in Kuno is to be done in the cool season. The lions will be first released into a circular area of 60 metre radius surrounded by a strong lion-proof chain link fence. They will be kept fenced for 10 days to help them acclimatise themselves to their new home.

All the lions, fitted with radio collars, will be monitored regularly after their release into the wild to assess the success of the programme through diet, reproductive performance and social organisation. Supplemental feeding of the lions through baits will be withdrawn 3-6 months after their release.

Subsequently, the translocated population will be supplemented by lions captured from Gir as a population management requirement. This will also add to the genetic diversity of the Kuno lions as fresh male lions are moved from Gir every 3-5 years and resident males in Kuno selectively captured for zoos. A free ranging population of 30-50 lions is expected to be built up in Kuno in the first 10 years.

With 8 tigers reported in Kuno in the last census in 1993, conflicts between the big cats is anticipated. However, foresters are hopeful that given the low density of tiger population in Kuno area and historical evidence of overlapping home ranges, serious conflicts between them may not occur.

Wild haven

Madhya Pradesh's Kuno sanctuary will need refurbishing

SHRI KRISHAN

Says M N Buch, chairperson of the Bhopal-based National Centre for Human Settlement and Environment, "Introducing the lions could be disastrous because Kuno is tiger country" (see box: *Preparing the jungle...*) Besides, he feels that "translocation is an experiment with a fair chance of failure" He points to an attempt in 1957 to introduce 3 lions in the Chandraprabha sanctuary in Uttar Pradesh that ended in the mysterious disappearance of the big cats.

Meanwhile, members of the Ekta Parishad, an NGO working with tribals, declare, "The tribals will not be able to cope with eviction from the forests and with an occupational change." About 90 per cent of the people in the area are Sahariya tribals, a forest-gatherer community that makes a living mainly by collecting and selling medicinal plants and herbs.

Breaking the Sahariyas' bond with the forest to accommodate the lions is a perpetuation of the tribals' growing alienation from the land, caused by official conservation strategies, says Kailash Parashar, curator of a Sahariya museum in Sheopur that showcases the distinctive tribal culture. He points out that the wholly forest-dependent Sahariyas, once responsible for developing and maintaining the forests, must now buy wood from the town to meet even basic needs like making beds.

Changes for the better

But officials such as D C Mittal, *tehsildar*, Karahal block, reason, "The tribals presently live on the verge of starvation. The change to agriculture will most likely be for the better."

Villagers in Kuno have been promised irrigated agricultural land in the resettlement site near Agra village. Says Sugra, a tribal woman, "The minister (Congress member of the Legislative Assembly Ram Niwas Rawat) assured us of land *pattas* (land ownership deeds) in the new site in Agra, drinking water and electricity."

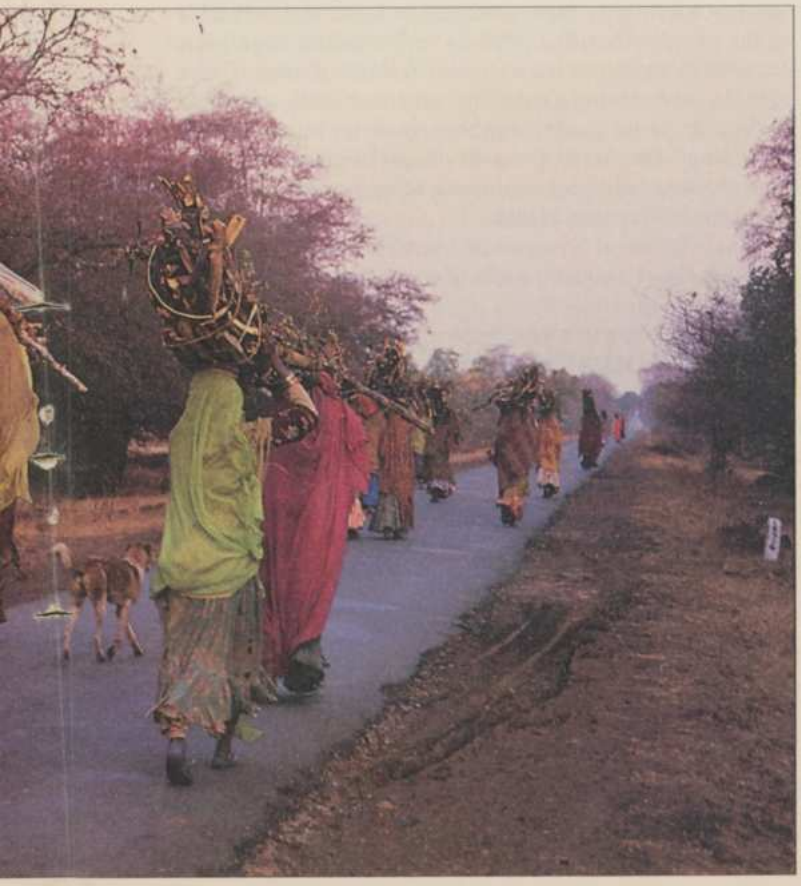
However, government schemes, like the Sahariya Vikas Abhikaran, promised much the same. "That relocation and fresh promises will not succeed in improving the people's lives can be judged from the number of government schemes already operating for tribal welfare and the crores of rupees allocated for them. The Sahariyas are still some of the poorest people in MP," contends Jaisingh Yadav, coordinator, Ekta Parishad, Sheopur.

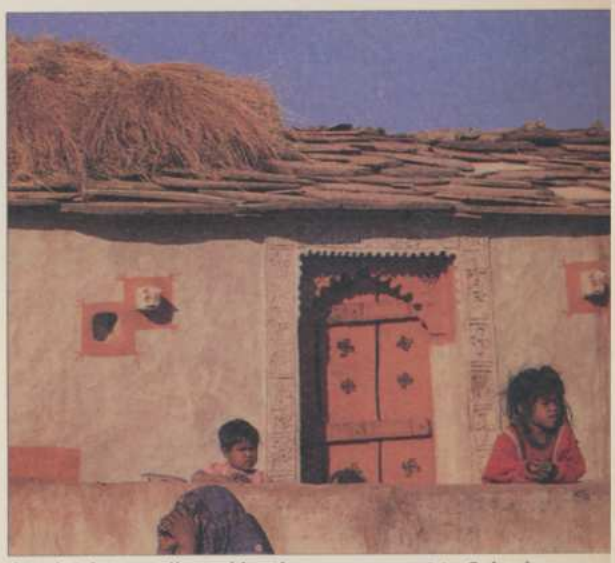
Mittal, too, acknowledges that "over half the handpumps installed by the government in all tribal villages are out of order and electricity is supplied for less than 12 hours a day" Sheopur MLA Ram Shankar Bhardwaj points out that cattle given on grant are mostly weak and unproductive. Similarly, subsidised wheat supplied to the tribals is of ridiculously poor quality.

About Rs 12 crore have been spent on providing 20 *pucca* houses in each tribal village under the Indira Awas Kutir and Gramin Vikas Kutir programmes, but the buildings remain empty. In Moraval village, most of them are used to house cattle, while traditional Sahariya huts have been built alongside others.

"The abandoned *pucca* houses are testimony that even the limited government aid that reaches the people is ineffective because it is not tailored to their requirements," states Yadav. "The government house is too big and I would be isolated from the community living in it because it is so far from the *saharana* (the tribals traditionally dwell in a close group of 10-15 huts)," says Rati Devi of Moraval, who has abandoned the *pucca* house her family built 2 years ago with a government grant.

Women carrying firewood close to Kuno sanctuary: the lions could wreck a symbiotic human-forest relationship





(Top) A house allotted by the government to Sahariyas used as a cowshed; (above) a traditional hut alongside

Segregated living quarters

The DFO also warns, "People of all communities must live together in Agra to save space." At present, each village has carefully segregated living quarters for different communities. Intermixing them could lead to quarrels.

Bhardwaj states that government welfare programmes have bombed largely due to corruption and because "instead of schemes to make them economically self-reliant, the large number of grants have only given the people free low quality benefits which they cannot value." It is most likely that a poli-

Safe custody

A zoo in Gujarat has provided yeoman service in preserving the Asiatic lion

Supplementing efforts to preserve the Asiatic lion, albeit in captivity, the Sakkarbaug Zoo in Junagadh has bred about 150 lions since the '50s. These have been sent to zoos in India and abroad and form the only pure-bred population of the cat in captivity.

Sakkarbaug zoo officer R D Katara reveals that the global captive breeding programme for the Asiatic lion was disturbed when a blood test method developed about a decade ago to distinguish between Asian and African lions revealed that almost all the zoo lions abroad were hybrids. The intermixing was traced back to a zoo in India which had once allowed both species to mix. Lions from the Sakkarbaug zoo then stepped in to help restore the purity of the captive breeding programme.

The pride of lions: controlled breeding

Inbreeding is another danger as all Asiatic lions today are derived from the small population of 30 lions surviving in Gir in the early twentieth century, says Katara. Adds zoo officer R H Sabapara, "Of our present stock of 34 lions, about 5 males and 20 females were caught from the wild, strengthening the genetic build of the breeding programme." Wild lions are captured from Gir forests when they are injured and require treatment, or if cubs are found abandoned.

The zoo, established in 1863 by the Nawab of Junagadh specifically to interact with the sanctuary, has undertaken controlled breeding of lions since the past 4 decades. It is now the Indian regional Studbook Keeper of the Asiatic Lion. Every lion in the programme now has a scientific history sheet with its physical specificatic.... including date of puberty and other details mentioned.

Lions bred in captivity, however, cannot be introduced into the wild. Nevertheless, as Katara says, "These form a second population which will be a safety net to complement efforts to build up the small wild population."

cy of rural "development" with all these proven shortcomings will be extended to villagers at the resettlement site, fears Yadav of the Ekta Parishad, and combined with loss of the forests, adaptation might be impossible.

On the other hand, pastoral Maldharis of Saurashtra like Khemakanabhai Karamta fear that by removing lions from these forests, "the government is not allowing us more space but giving entry to industries" Also afraid of being squeezed out are owners and cultivators of the rich agricultural land and mango orchards surrounding the Gir forests.

Says Chandrasinh Mahida, convenor, Saurashtra Paryavaran Sanrakshan Parishad, which is spearheading a movement against the industrialisation of the *nagher* area (coastal area of Saurashtra stretching from Madhavpur in Junagadh district to Jaffrabad in Amreli district), "The Maldharis are being driven out of the forests. Now, large mineral-based industries have surveyed the forest area for mining and there is political pressure on the forest department to give land for the purpose. The government is using the lion as a pawn to achieve its own ends."

No political leader in the state has come out in opposition to the lions' translocation move although local resentment against it is growing, "because politicians cutting across party lines have vested interests in the industries, all of which are desperately looking for avenues to expand prospecting into the forest," claims Mahida.

Twentyseven big industries have come up in areas surrounding Gir in the past 5 years. The Saurashtra region is estimated to hold limestone reserves of 1,150 crore tonnes, and most of the state's 70 crore tonne reserve of lignite is found in the region. Both limestone and lignite are used in cement production. The area is also rich in minerals such as bauxite, chalk and dolomite.

Mineral-based industrial development has already led to environmental changes, affecting the farm sector, groundwater and the health of the people. "About 15,000 ha in Saurashtra have been acquired by industries from farmers by dubious means," says Mahida, "and extensive areas that were once fertile croplands or *gauchar* (pasturelands) have been converted into wasteland by mining." Farmers in about 40 villages have been forced to leave the area following acquisition of land by industries for limestone mining, says Mahida.

The villagers of Navagam in Amreli district have moved the High Court against the sale of about 6 ha of agricultural

Empty house in the Gir

Industries might rush in to fill the vacuum

SHRI KRISHAN

The Ambuja cement factory at Amreli, abutting the fields on the Gir's periphery: 'We can only sell our land and move away'

land in the village by its trustees in Lok Bharati, a registered NGO, to the nearby Gujarat Ambuja cement factory for quarrying limestone. But *sarpanch* Dhirubhai points to the mines abutting their fields. "We can only sell our lands and move away eventually," he says.

While Kanubhai Domadia, president of the Junagadh district unit of the Western Gujarat Chamber of Industries, which represents 40 industrial houses, states that the region's Rs 8,000 crore industrial investment has given jobs to 40,000 locals, Mahida claims that the workers are largely outsiders.

The extensive mining of limestone, a porous rock that helps in the natural recharge of groundwater, "will soon turn the area into a desert, when combined with the natural increasing salinity of the soil," fear workers of the Aga Khan Rural Support Programme. Forest officials in Junagadh confirm the falling groundwater table in areas surrounding the forests, adding that the cultivation of water-intensive crops could be a contributory factor.

Instead, Mahida suggests promoting agro-based industries related to major crops such as sugarcane, groundnut and coconut, fish processing industries or leather processing units, given the area's cattle wealth.

Ecological benefits

Resentment against the lions' translocation is strong among non-forestdwellers also because the Gir forest provides ecological benefits to the whole area, says Shankar Narayanan of the Ahmedabad-based Gujarat Ecology Commission. Gir and surrounding areas receive perceptibly higher rainfall than the rest of Saurashtra (Gir: 950 mm annually; Junagadh district: 750 mm annually). "Water-intensive crops such as sugarcane are the mainstay of farmers in a relatively low rainfall region that is also drought-prone," he says.

Resentment against the lions' translocation is strong among non-forestdwellers also because the Gir forest provides ecological benefits to the whole area

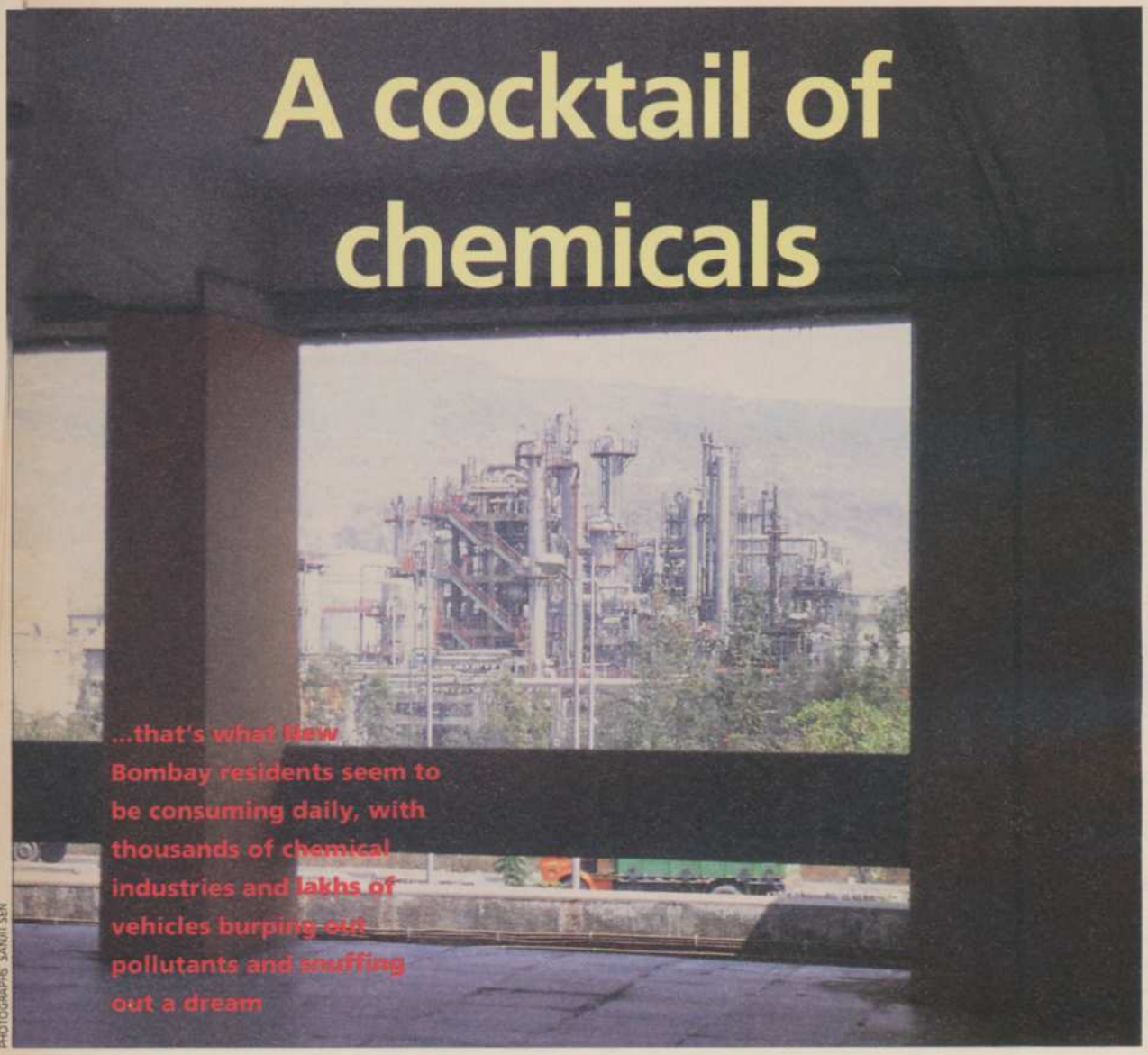
The Siddhis, a local community of African descent, who make a living by collecting and selling fallen wood, fear that a decline in lion population could lead to an explosion of the herbivore population which could strip the forest bare, says Irbai of Jambur village.

The translocation plan leaves even forest officials glum. Says B L Gupta, deputy conservator of forests, Junagadh, "The natural dispersal of lions from Gir sanctuary could mean an extension of the habitat suitable for lions, not a saturation of the sanctuary's carrying capacity. Instead of artificially introducing lions elsewhere, the entire ecosystem around Gir could be developed on the lines of Girnar to accommodate the growing population."

Gir officials also anticipate hitches in plan implementation, particularly those who were excluded from participating. Says H S Singh, conservator of forests, wildlife circle, Junagadh, "We received formal intimation of the plan only when the WII report was sent to us in mid-January along with a request to comment on the time-frame of implementation."

Narayanan feels that Madhya Pradesh could learn from the experiences of protected area management in Gir to avoid similar mistakes. But as far as the people are concerned, the mistake has already been made. ■

A cocktail of chemicals



...that's what New Bombay residents seem to be consuming daily, with thousands of chemical industries and lakhs of vehicles burping out pollutants and snuffing out a dream

PHOTOGRAPHS SANJIT SEN

AMBIKA SHARMA

A DREAM blown to dust is how you could describe today's wheezing New Bombay, the once promised green haven on the fringe of gas and smog smothered Greater Bombay.

Two decades ago, the Bombay Municipal Regional Development Authority (BMRDA) had decided to develop a clean, self-sufficient residential area west of the Maharashtra Industrial Development Corporation's (MIDC) industrial zone. But today a gagging pong of pollution emanates from the 2,068 industrial units in the Trans-Thane-Creek (TTC) industrial area, and 8.7 lakh vehicles weave serpentine trails of smoke —about 2,000 tonnes of pollutants are added to the atmosphere every day, 7.6 lakh tonnes a year.

The TTC has the country's highest concentration of chemical industrial units, comprising almost 70-75 per cent of the units located here. Most of them are linked to the petroleum industry. However, pollution apart, even the faulty infrastructural urban planning of New Bombay has also drawn flak.

Experts are warring about whether vehicular or industrial pollution is the true culprit. Dust from construction sites, roads under repairs, quarrying and transportation of soil, along with burning of firewood and cowdung in poorer homes aggravate the situation. Respiratory tract diseases are on the rise, though their links with pollution is yet to be firmly established.

Confusing and meagre databases lending themselves to wildly varying interpretations means that no clean corrective strategy has emerged. And an allegedly toothless Maharashtra Pollution Control Board (MPCB) has been accused of indulging in dirty practices, abetting the industry in keeping the air foul.

The state government has been trying to come up with a practical solution. But procedural barriers, including the Official Secrets Act, are smokescreening data access.

Approached by various United Nations fora and the International Atomic Energy Agency, the Department of Atomic Energy had asked the Bhabha Atomic Research Centre (BARC) to conduct a risk assessment study for the Thane-Belapur Industrial Area (TBIA) in 1989. Under this Inter Agency Project (IAP) the BARC has been conducting ambient air quality studies for the past 3 years.

Ironically, "The results of this continuous automatic Air Quality Monitoring study cannot be made available to the public as it is a BARC study under the Official Secrets Act," says T N Mahadevan, who heads the monitoring station at HICO Products Ltd.

But is industrial or vehicular pollution the main culprit? "The trend analysis for 1978-1991 indicates that suspended particulate matter (SPM) is persistently high, followed by increasing levels of nitrogen oxides (NOx). The levels of sulphur dioxide (SO_2) are decreasing as cleaner fuels are used": this was reported in the government of Maharashtra-initiated study, the Environ-mental Management Strategy (EMS) and Action Plan for Bombay Metropolitan Region under the Metropolitan Environment Improvement Programme (MEIP).

The only data available for January to March 1990 gives the 95 percentile values of a few chemicals. The government had subcontracted Apte Consulting Engineers to prepare this report on the Chembur and Thane-Belapur industrial zone. The data in the MEIP-Integrated Urban Environmental Management report was collected from industries which had carried out air quality surveys for short periods. The post-analysis conclusions were arrived at consensually by consultants, industrialists, the Maharashtra Pollution Control Board (MPCB) and NGOs.

Varying values

The values of SPM taken at various points along the 19-km Thane-Belapur (TB) Road range from 171.3 to 333.5 micrograms per cubic meters (µg/cu m). While those of sulphur dioxide and nitrogen dioxide vary from 30.5 and 13.3 to 65.5 and 25.7 µg/cu m respectively, CO and hydrocarbons (C_6-C_{10}) cross the standard limits of 4.375 and 0.25 µg/cu m at many places, with CO reaching a high of 5.2 µg/cu m and HC reaching 1.8.

The MPCB did an air quality inventory of the area from November-December 1994 and positioned its vans at various sites along TB Road. The results indicate slightly high levels of SO_2, at points reaching 70-80 µg/cu m. NOx, ammonia (NH_3) and hydrogen sulphide (H_2S) meet the prescribed Central Pollution Control Board (CPCB) standards. Recording very high values of SPM at various points, the EMS inventory shows that of the daily pollution load, the transport sector accounts for 1,550 tonne per day (tpd) and industry emits 418 tpd; the power and domestic sectors release 91 tpd and 23 tpd respectively. Clearly, vehicular traffic takes the lashing.

But, asks Amar Ranu, chairperson of the Save New Bombay Committee, "Which limit do we accept? If we accept the industrial limits, then the values are well within CPCB-prescribed limits. But with a population of around 7.5-8 lakh people forming the risk group, is it safe to accept the pollution levels at industrial zone standards and not residential limits?"

Ranu also flays the MPCB for not conducting tests for the levels of non-criteria pollutants like HC and benzopyrene, despite a heavy concentration of petroleum based industries in the area.

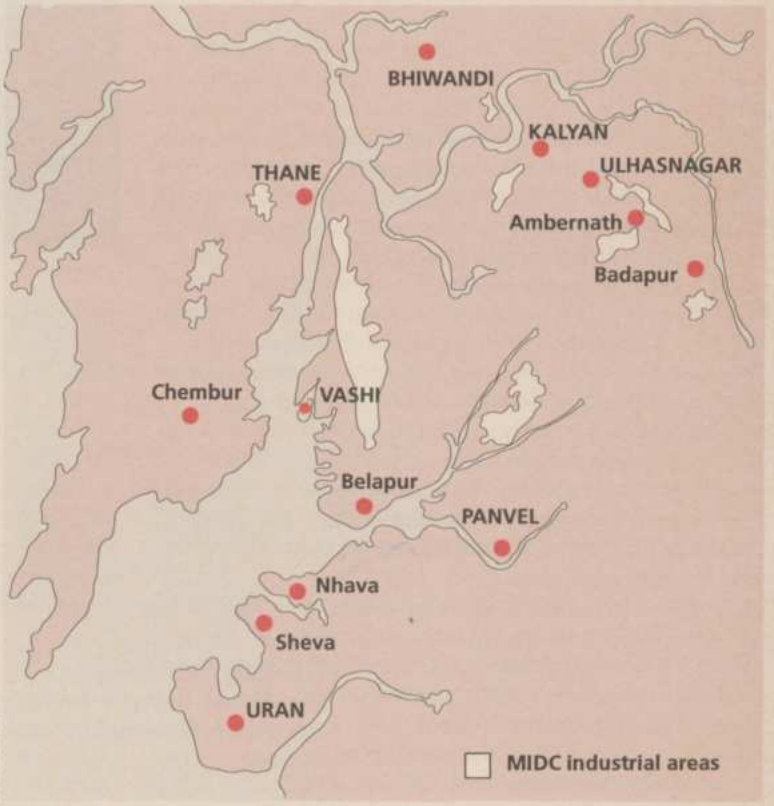
Debi Goenka of the Bombay Environmental Action Group (BEAG) blames "industries like NOCIL, Herdillia, PIL, Standard Alkali and Reliance in the TTC area and RCF, HPL, Oswal and the Tata Electric Company" Goenka also castigates the burning of refuse at the BMC dumpyard in Deonar just across the creek from Vashi, and heavy vehicular traffic on the Bombay-Pune highway.

Goenka says, "New Bombay is trapped between Chembur and the TTC industries, with the Parsik Hill range adding to the problem by trapping the pollutants on the western side and preventing their dispersal."

Rashmi Mayur, director of the International Institute for a Sustainable Future, is more categorical: industry is responsible for up to 65 per cent of the pollution. Vehicular pollution is most noticeable near the Thane creek

What a gag

The Trans-Thane-Creek industrial area has India's highest concentration of chemical industrial units



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bridge, Greater Bombay's entry point, where engines idle to pay toll tax.

But Soli Arcewala, chairperson, AIC Watson Environmental Consultants Pvt Ltd, which was contracted for the EMS study, says, "Industrial pollution is just not there. We are sufficiently below the World Health Organization's permissible limits for NOx and SOx. Up to 70 per cent of the total pollution load is contributed by traffic, and only 10 per cent by industries." Arcewala dismisses the once-in-a-while crossing of limits as "episodal occurrences. The factories are all meeting the emission standards." Besides, he says, the strong sea breeze blows away most industrial pollutants.

Peak hour escalation

Arcewala warns that peak-hour escalation of SPM — up to 500 per cent — needs urgent attention. The use of better fuel has actually reduced SOx levels, but NOx and CO values have increased because the number of vehicles has gone up by 300 per cent since 1971.

Anand Apte of Apte Consulting Engineers, too, blames vehicular pollution in the main. "The ambient air quality status is not good, but it is much better than it was 7-8 years ago."

However, Saranathan of Society for Clean Environment contests this conclusion. He points out that Apte's report showed low levels of NOx and SOx and a high level of HC. He says that the traffic factor "does not explain the low concentrations of NOx, which should also be high"

R K Garg, director, IAP, says that although exact figures cannot be given, the SPM levels are high — about 400-500 µg/cu m. Hydrocarbon levels are high, but continuous data is not being collected. NOx is reasonably below the stipulated standards while SOx does at times touch the upper limit.

Even government officials bicker. D B Boralkar, heading the Air Pollution Control Laboratory at the MPCB, Belapur, lays the blame on small and medium scale industries. His recent pollution inventory shows that "the values of SOx are on the higher side, with definite peaks appearing from time to time."

Garg is foxed about which standard to accept. Residential and industrial areas are interspersed and the CPCB respective standards vary substantially. The annual average for SOx is 60 µg/cu m for residential area and 80 µg/cu m for industrial area. The average for SPM varies from 200 to 500 µg/cu m for the two areas.

Tracing the roots, Mehta explains, "In the '60s, when these industries were set up, there was no population nearby. Nor was there environmental awareness or expertise in pollution control. Awareness increased only after the 1984 Bhopal tragedy."

As for facilities, "We have just 2 air quality monitoring vans, only one of the continuous automatic type. With over 8,000 industries in the region, we try to do our best." Result: infrequent monitoring.

"In 1993-94, some 1,531 samples were collected, which means approximately 31 samples from each of the 30 stations here," Mehta says. "In case of a complaint, the MPCB visits the area to do 8 or 16 hour samplings, but only 'criteria chemicals like SO and HS are tested. We do not have the sophisticated equipment to test non-criteria chemicals."

The monitoring of smokestacks is done once in a quarter or once or twice a year. Mehta agrees that the MPCB does not have enough data to recognise peaks, even micro-meteorological data at the time of sampling. There is no coordination between the urban planning and the environment departments.

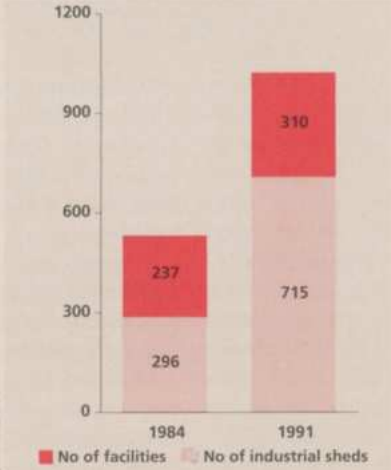
R S Patil, associate professor at the Centre for Environmental Science and Engineering, IIT, Bombay, says, "Air pollution inventory requires highly sophisticated equipment and a thorough knowledge of meteorological data and source emissions." While the meteorological data remains generally stable over a period of years, with micro-meteorology changing daily, source emissions change with a new process and a new industry.

Patil says, "The meteorological conditions of the winds are such that the downwind receptors of residential areas get affected." The general wind direction in the Trans-Thane-Creek region is mostly from southwest to northeast.

Pollution is higher at night, she explains, "because in winter, night

Rising stacks

The Thane-Belapur Industrial Area's units keep increasing



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atmosphere is stable and temperature inversion is a common phenomenon. This condition does not allow the mixing of gases — a situation that can be very dangerous. The same goes for early morning and late evening." The cumulative effect of even low-pollution small units can be very high, as their stacks are close to the ground and do not facilitate effective dispersal, creating localised problems. The large industries have a regional effect because of their high stacks.

Goenka holds that the problem will go unresolved because there is still no independent pollution monitoring. "MPCB data is unreliable. Whatever little there is does not reflect the actual air quality."

Flagellating the MPCB's credibility, he says that of the 5 government secretaries in the board, "the chairperson is a bureaucrat, 3 are MLAs or MLCs and there is one NGO representative — they believe that tree planting is the solution to all environmental problems."

Being shackled by the government's priorities, the MPCB, Goenka says, "is understaffed, underfunded and lacking in technical expertise. There are 40-50 field officers for about 1.5 lakh factories in the state." Corruption is endemic. He also accuses the implementing authorities, the courts, of siding with the industries in cases filed by the NGOs. Says Ranu, "The existing regulatory bodies are defunct and are surviving on the payrolls of industries."

Boralkar says defensively that their best efforts are scuttled because "there are too many obstacles on our path. The MPCB has the best political and administrative infrastructure in the country, yet we cannot do much in the absence of a political will." The MPCB's staff of 400-500 is very inadequate, the technical humanpower virtually absent.

In a World Bank-funded project to improve the status of the pollution control boards of 4 states in 1991-92, the MPCB was given top priority. The project had sanctioned 268 posts, but, Boralkar reveals, no recruitment rules were prescribed and the posts are still lying vacant.

In 1992-93, the Central government procured Rs 4.2 crore for the MPCB from the World Bank to buy the latest pollution monitoring technologies. But the MPCB has received only voltage stabilizers, generators and 6 jeeps. "Are we serious about our environment?" asks Boralkar. S S Kulkarni, technical advisor, MIDC Head Office, says, "The MIDC does not have the required knowhow of pollution control technology."

Boralkar says that the MPCB has no powers to stop errant units. It can merely ask the MIDC and the Maharashtra State Electricity Board to sever water and power supplies. By then, Delhi bigwigs have been petitioned to stall the action. "This department," says Boralkar pointedly, "is as corrupt or as honest as any other government department."

Ranu cries hoarse that the MIDC is dirtying the waters further with its policy of setting up 3 more industrial areas in Uran, Panvel and Taloja. Residential and industrial areas have merged without an exclusion zone between them, excepting the Thane-Belapur road and the railway line.

Goenka says that the MPCB's chalking out of different standards for commercial, residential and industrial areas has compounded the confusion, because all the zones coexist and often overlap. Besides, there are no emission standards for CO, hydrocarbons, benzopyrene and other organic chemicals. "This being the largest chemical industry belt in the country, people end up breathing in a cocktail of chemicals."

In the post-Independence era, the government had speed-driven industrialisation, bothering little about environmental consequences

But most officials talk about a Gordian knot of factors behind the current mess. That Bombay would explode into a megapolis had not been not envisaged when the MIDC-TTC was recognised in the '60s. In the post-Independence era, the government had speed-driven industrialisation, bothering little about environmental consequences.

In fact, industry representatives accuse the government for letting residential areas crowd into the industrial zone. N Sadasivan of the Thane-Belapur Industrial Association says that the industries came to the area first, and were assured that a minimum buffer zone of 1-2 km would be maintained between industrial and residential areas. Today, there is a human deluge, a giant risk group.

With powers restricted to land allocation, the MIDC's hands are tied, Kulkarni gripes. Once a proposal receives no-objection certificates from the MPCB and the environment department, the MIDC has to oblige. It can refuse to give land to a unit it feels has polluting potential, but the ultimate decision lies with the environment department. Unfortunately, he adds, the Environment Impact Assessments (EIA) submitted by the industry are not open to the MIDC.

Two other factors dog the issue. First, says Kulkarni,

"Western countries are unabashedly dumping their outdated, high-polluting technologies here; second, we accept this unfairness because as a nation we have very little social responsibility"

Goenka holds that most industries set up in the '50s and '60s cut costs by installing pollution control equipment instead of modern low-pollution technologies — technologies that are superannuated and ineffective. Mayur says that the 15 per cent of the units that have invested in state-of-the-art technologies are brought low by the majority, which uses leaky, anachronistic systems. Ranu would have the chemical industries update technologies every 10 years, with defaulters facing dismantling or relocation.

The state government seems to be realising the extent of the problem — and now, as P M Byas, director, environment department, says, new polluting units will not be sanctioned.

Coughing up sinking health

The incidence rate of major diseases in the New Bombay area is very high, and growing

Disease	Total	Per 1,000 people
Malaria	54	7.63
Leprosy	17	2.40
Tuberculosis	19	2.68
Respiratory Disease	115	16.25
Diarrhoea	3	0.42
Sample Population	7,075	

Breathing is a problem: patient in a Vashi clinic

Low-pollution engineering and electronic units are being cleared, along with old units which will be allowed to expand in their own backyards.

The industry is slowly mending its ways: Sadasivan says that most of them are now trying to use all available control devices. Arcewala reasons that the exercise is self-defeating, since most smallscale units can't afford even consultants.

Even those who can afford it, won't. Arcewala explains that a new smallscale distillery costs Rs 2-3 crores and a complementary effluent treatment plant costs about the same. More to blame, the concept of waste minimisation, and its ultimate cost-effectiveness, has not percolated to the lower levels of industry.

G S Gill, joint managing director of City and Industrial Development Corporation of Maharashtra Limited (CIDCO), explains that urban area planning in the region was initiated in the early '70s, a decade after the industries came up. The idea then was to provide the growing workforce with low cost housing close to the factories.

But, Ranu points out, no EIA was done. Gill says that before the residential area was demarcated, the National Environmental Engineering and Research Institute at Nagpur had conducted a study, but it had not come out strongly enough against pollution issues. The "convenience factor" outweighed environmental concerns.

Opinion is divided over whether pollution is responsible for the growing incidence of some diseases. R K Garg, dismisses this allegation based on surveys conducted last year. But Mayur claims that his own study of Thane district shows that "most of the people diagnosed are suffering from cold, cough, headache, fever, emphysema, dizziness, tiredness, and their feeling is that it is due to extremely high levels of pollution"

M A Chitnis, medical officer, NOCIL's polymer division, speaks of a 60-71 per cent increase in malaria cases (from stagnant and polluted waterbodies) and a 8-10 per cent increase in respiratory illnesses. "This is an approximation. A detailed epidemiological study is a major requirement today," he says.

S D Tekchandani, consulting pathologist at Vashi's Lakshadeep Hospital, corroborates that there is "an increase in upper respiratory tract illnesses like chronic cough, bronchitis and asthma. But the increase will be more noticeable in another 5 years or so as pollution related problems take a few years to surface, and a majority of the population came here in the past 2 or 3 years."

While Tekchandani's colleague, S Asgekar, agrees with him, he says that the sudden increase in the population density could also indirectly help increase morbidity levels. Asgekar feels that schoolchildren and the aged, both with low levels of resistance, form the risk groups. No health status survey has yet been conducted, he says, but some results will be available once the IAP is complete.

For a clearer sky

Better late than never. The TBIA has now been declared an Air Pollution Prevention Area under the Air Pollution Prevention and Control Act (1986), and all industries are required to comply. Apart from planting trees and encouraging community participation in improving the environment, CIDCO is also keen on sponsoring continuous air quality monitoring stations, each of which costs only Rs 2-3 lakh. It is contemplating a multipronged approach, incorporating tree-planting, "*smruti* vans" and developing water sports complexes, besides undertaking waste recycling.

The state government is actively promoting awareness, which Saranathan views as a "small but significant start" It is also considering integrating its various departments for environmental action. In fact, Ranu is happy that for the first time the government is contemplating environmental action beyond just planting trees, to which the TBIA still sadly confines itself. The MIDC is planning to help MPCB by setting up monitoring stations in 11 zones — barring, ironically, its own TTC-MIDC area!

However, hard realists like Mayur prefer to restrict their appreciation to a moratorium on industrial growth in the area. "This, hopefully, will not increase pollution," he says. Hope, in fact, is the only thing left. ■