Tannery pollution in Tamil Nadu

by P. Muthu

The enormous growth in the tanning industry, and the introduction of new chemicals, has resulted in polluted groundwater and drought.

THE REVELATION OF an almost fatalistic resignation among the people of tannery-populated areas is neither shocking nor unbelievable. That tanneries pollute the environment is recognized by everyone, including the tannery owners. But tanneries damage more than the environment: they affect each and every aspect of the lives of the people living anywhere near them.

Tanning is an ancient trade in India. Historians believe tanning to have links with religious practices in India in past times, when goats were offered as sacrifices to the gods. The skins from the carcasses were processed by 'vegetable tanning', and the finished leather was then fashioned for local needs, usually in percussion instruments and as water vessels. India's dairy animal population grew, and made India a major producer of tanned leather. Demand for this product grew in leaps and bounds, so much so that towards the middle of this century, especially after the Second World War, the scenario of tanning in India had changed altogether. New, more rapid and efficient 'chrome tanning' replaced the laborious but relatively harmless vegetable tanning. In addition to this qualitative change in the methodology, the number of tanneries had grown and were concentrated in Tamil Nadu (which accounts for 729 of the total 1216 industries), and scattered in other states like West Bengal, Maharashtra, Andhra Pradesh, and Bihar.

This community well is severely polluted, a result of contamination from the tanning industry.

Demand and development

Many factors have contributed to this phenomenal growth and the continued existence of tanneries, and to their ability to ignore the damage they are causing to the environment.

- The raw material, skin and hide, are available in abundance.
- A pool of cheap labour is available, and is willing to work in appalling conditions.
- Tanning has become a very lucrative business. It is the fifth highest foreign exchange earner for India.
- The Government of India recognized this potential for foreign exchange earnings and took a series of steps to promote the development of the leather industries: it banned exports of raw hides and skins; imposed quota restrictions on the export of semi-processed hides and skins; and encouraged tanners to establish finishing units by allowing imports of machinery on the open general licence (Mohanty, 1977).

Tanning as a source of environmental pollution, especially to water sources (and thus to the human population), has been recognized in many Northern countries: many have banned tanning altogether, some have limited it or introduced efficient effluent treatment procedures. Countries such as Japan, Italy, the former Soviet Union, USA, UK, Canada, Australia, Switzerland, Germany, Sweden, and Norway import leather products that are processed and finished in India. These countries supply sophisticated instruments, high quality chemicals, and the latest know-how, and get the finished leather goods from India in return. A more recent development is for raw hides and skins to be shipped to India from some African countries and the former USSR for processing *here*! All this has been possible under bilateral trade agreements, from which the Indian Government blatantly claims substantial gains.

Effects and evidence

Tamil Nadu, with more than 60 per cent of the tanneries in India (concentrated in Ranipet, Ambur, and Vaniyambadi in North Arcot District,

Dindugal in Anna District, and Chrompet near the capital city Madras), was the ideal place to illustrate the problems of water pollution caused by the leather industries. In addition to the usual problems that tannery effluents cause to the environment, there are some specific serious problems that the people of these areas face.

Table 1. India's exports of leather and leather products (million rupees).

	1973	*%*	*1981*	*%*	*1991*	*%*	*1995**	*%*
Semi-tanned leathers	1523	82.7	503	12.6	40	0.1	—	—
Finished leathers	172	9.3	2268	56.7	7656	30.0	7000	11.1
Footwear components	5	0.3	451	11.3	5860	23.0	8000	12.7
Footwear	97	5.3	338	8.4	2104	8.2	15000	23.8
Leather garments	4	0.2	52	1.3	5792	22.7	20000	31.8
Leathergoods	40	2.2	386	9.7	4086	16.0	13000	20.6
Total	1841	100.0	3998	100.0	25538	100.0	63000	100.0

Table 2. India's share in world livestock — 1987 (million heads).

Species	*India*	*World*	*India's share in the world (%)*	*Rank in the world*
Cattle	189.9	1277.7	14.8	1
Buffalo	74.8	138.3	54.0	1
Goats	92.0	501.7	18.3	1
Sheep	43.0	1157.6	3.7	6

Drinking-water shortage

Chrompet, Ambur, Ranipet, and Vaniyambadi lie on the banks of the Palar River, and Dindugal on the banks of Kudavanar River, one of the primary reasons for the appearance of tanneries in these areas. These rivers were once perennial and there was no water problem for either the farmers or the tanners of the area, but they are no longer perennial, and they run dry during most of the year. The abundant groundwater was the natural first alternative, groundwater which was once potable to the extent of being called 'sweet', and was reached at depth of only 50ft. Now this water is completely polluted and is extremely salty, even down to depths of 200ft., as the soil in these areas offers very little resistance to the percolation and seepage of effluents. The drinking-water situation is the same in all the areas of our study: there is none available. Water now has to be brought in trucks and even in specially designed bullock carts and bicycles from more than 10km outside the radius of the tanneries. This water is sold to the people at 50 paise per 10 litres and is used only for drinking and cooking. For all other uses in the house, such as washing cooking utensils and watering livestock, the people depend on the highly polluted groundwater. Many families complain that the vessels in their homes have turned black as a result.

Several villages in Ambur get water through pipes from hitherto unaffected villages upstream of the dry Palar. The tanneries themselves require voluminous amounts of potable grade water (chloride free) for their leather processing. (During soaking, deliming, pickling, batting, tanning, and finishing operations large quantities of fresh water are required.) Inevitably, it is the tanneries which get the lion's share of the water that is brought from far off. Many poor families in these areas who do not have access to even the polluted groundwater go without a bath for weeks, as the little water that the women bring in pots after long treks is enough for consumption only. The situation is so bad in some areas that the tannery owners have had to buy pieces of land from around the area and outside the radius of the affected villages for the sole purpose of obtaining clean groundwater for their tanning. This in turn spreads the water shortage to this new area. The tannery owners sink borewells to great depths which results, within a short period of time, in the drying up of all other wells used for agriculture. Very soon agriculture ends here too, leaving many families without a livelihood.

Health hazard

Even though the once full rivers are now dry, tanneries on both sides of these rivers continue to discharge their effluents into the river beds. One can see rivulets of effluent running on these dry beds, and in some places joining, like a miniature river of sludge. In Ambur and Vaniyambadi some tanneries let their effluents into crude pools in the river sand. These stagnant pools and rivulets of effluents, apart from being eyesores and giving off obnoxious odours that engulf the vicinity, are breeding grounds for insect vectors of many diseases like malaria and filaria. The 'soak waste', which is the effluent released after the first stage of processing, contains dirt, dung, blood, soluble protein, and proteolytic and other bacteria. Many reports in the scientific press have proved this effluent to be ideal media for the proliferation of germs of many tropical diseases.

Effluent water from such rivulets and stagnant pools percolates down to the water table. Such groundwater contamination is known to be present even 4 to 5km around a tannery. The extent of contamination varies with different geological conditions of the water table. Dindugal, unlike the other areas with similar problems, has its tanneries more scattered, and so the extent of groundwater pollution is bound to be greater here.

As the potability of water as far as the layman is concerned is measured by taste and does not necessarily involve measurement against scientific standards, there might still be toxic constituents above the allowable limit in groundwater that is being fetched and consumed from the supposedly unpolluted areas. Previous reports prove that the level of hardness was found to be as high as 9200mg/litre compared with the tolerance limit of 300mg/litre recommended by the Indian Council of Medical Research for drinking-water. Chloride levels ranged from 956 to 16 589mg/litre compared with the tolerance limit of 200mg/litre.

In the 'chemical tanning' process as many as 250 chemicals are used, including heavy metals such as cadmium, arsenic, and chromium. Chromium in borewell water ranged from 12 to 117ppb, far above the permissible limit of 50ppb. Chromium in its hexavalent state is toxic to people when the daily intake exceeds 200mg. Apart from causing cancer, it could have other effects because of its capacity to penetrate cells and mutate the DNA. Chromium ulcers result when chromium comes into contact with already broken skin.

Effect on agriculture and livestock

Some of the 100-odd tanneries in Ranipet release their effluent into a common canal which was once the canal used by farmers to carry water to their fields. This canal runs through five villages before it dumps its contents in the Palar River bed. The once fertile agricultural lands on which paddy, sugar-cane, and groundnut were

raised now lie barren and desolate in mute testimony to the effects of effluents. The high level of chloride and other salts in the effluent chokes the soil and prevents anything from growing there. Chromium has also been implicated in affecting certain important life processes like photosynthesis and growth in plants. Apart from seepage, during the rainy season the fields on either side of the canals get flooded with the obnoxious sludge, which spreads everywhere and chokes everything in the vicinity. Hectares and hectares of land have been lost to the tanneries in this way. (Earlier reports say that 20 million hectares of agricultural land have been devastated in North Arcot district alone.) This has led the once proud and self-sufficient farmers to turn in desperation to manual labour in the tanneries themselves.

The population of livestock in these areas has steadily dwindled because of the scarcity of grazing pastures and fodder. Cattle have even died as a result of their drinking the effluent water from the open canals.

Socio-economy

The lives of each and every individual in the region are closely linked with that of the tanneries, and this dependence has paved the way to exploitation of the people. Once the tannery workers were only a small proportion of local landless labourers or 'agricultural coolies'. Now, after more and more agricultural lands have been lost to the tanneries, even once prosperous farmers have had to turn to the tanneries for their livelihood.

The appalling working conditions inside the tanneries led to many occupational diseases such as dermatitis, bronchitis, acid burns, asthma, allergic disorders, chromium poisoning, and azoospermia — and finally forced the workers to complain and protest through labour unions. The tannery owners thwarted the protests by dismissing the protesters and bringing in labourers from other regions. This has created, over the years, an almost palpable undercurrent of hostility between the different communities now involved in the trade as labourers.

Legal aspects

The government of India does recognize the problem of pollution from tannery effluents. It has laws that are equally if not more comprehensive than those of other countries. The history of using laws to prevent water pollution is quite old. A provision in the criminal procedure code of 1898 (section 133) empowered District Magistrates to pass an order to prohibit a factory from discharging into a river noxious effluents which might also be injurious to the health of the community. Other laws were also passed after independence. The Factories Act of 1948 authorizes state governments to make rules prescribing the arrangements required for the disposal of wastes and effluents (Section 12). The Water Pollution Control Act of 1970 adopted by Maharashtra served as a model for the national legislation enacted four years later.

The Tamil Nadu Pollution Control Board, established in 1982, has the responsibility of administering the Water (Prevention and Control of Pollution) Act, 1974 (amended in 1978), the Air (Prevention and Control of Pollution) Act, 1981 (amended in 1987), the Environment (Protection) Act, 1986. All new and existing industries are required to apply to the Pollution Control Board for permission to discharge sewage or trade effluent into any stream, well, sewer, or on to land. Violations carry punishments of not less than six months imprisonment, extendable up to six years, and there is also provision for imposing fines.

Nothing much has been achieved so far despite such comprehensive legislation. Many state pollution control boards are inactive, others prefer to reason and persuade, generally fruitlessly, rather than enforce. As of 1981, out of the hundred-odd court cases the Central Pollution Control Board initiated, only a few of the offenders could actually be penalized. The rest were able to escape through the numerous loopholes in the law.

Technologies do exist to treat tannery effluents in stages and either to release the relatively harmless effluents, or to recycle them completely for their own use. Even if a package solution for treating the effluents is developed and given to the tanneries, it is doubtful whether the factories will implement them. They argue that it was the government that encouraged the tanners with all sorts of subsidies and loans to export leather, and hence that it is the government that should build common treatment plants for effluents from various industries in an area.

Some institutions, such as the Central Leather Research Institute (CLRI) and (NEERI), did develop and set up a pilot plant for effluent treatment, at an industry in Ranipet. But because of the lack of interest and involvement of the factories, the pilot plant failed. Many other industries used this as an excuse to put off investing in this direction. Still, some tanneries have set up prototype treatment plants which are proudly displayed to the visiting inspecting authorities. But the painful fact is that some of these treatment plants are built with a capacity way below the tanneries' requirements. Thus these tanneries release only a fraction of their effluent to these plants and the rest is discharged untreated.

When the Tamil Nadu Government threatened to close some of the tanneries down unless they treated their effluents or fully paid the government to do so, the Leather Export Promotion Council, representing the leather industries, persuaded the government to defer its decision until some agreement could be reached on sharing the expenses. That agreement has yet to be reached.

Thus it is imperative that the government, which liberally helped the industries to open and develop, and which boasts of the amount of foreign exchanges gained from the industry, takes a firm stand and enforces the laws laid down to protect the environment. It is up to the government to see that the rights of all people in the area are protected. So far there has not been a concerted effort to fight against this injustice, where so many people are exploited and a few benefit more and more.

Verdict

Trust-Help, Madras v. The Government of Tamil Nadu, India. The defendant did not react in any way.

The Jury found that because of increased foreign demand and the use of new chemically based tanning processes the pressure on the environment from this sector has increased substantially. In addition, the Jury found that workers are being unduly exposed to the harmful effects of the chemicals used in the tanning process. Because there is presently pending before the Supreme Court of India a case on the practices of the tanning industry in Tamil Nadu the jury, not wanting to prejudice that decision, refrained from further comments on the case.

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