TAMIL NADU

Leather Processing: Role of Indigenous Technology

This article discusses a study of leather artisans in Tamil Nadu, which accounts for the lion's share of leather-processing in India. It looks at the effects of export-oriented growth, use of chemicals in tanning and the sidelining of the age-old local knowledge, on the survival of small village-based leather-processing units.

V SUJATHA

Models of development were a subject of debate among policy planners and academics during the heyday of five-year plans. But the debates now seem to have died down and there is a tacit acceptance of one option – global trade. The fall of the socialist states has endorsed the capital and export-oriented model of development. Policies favouring capital-centred growth are legitimised in the name of liberalisation and the state is emerging as a bourgeoisie par excellence.

While there can be no single blueprint for development, there should be total agreement that fulfilment of basic needs, such as food, shelter, health and education, is the first and indispensable step in the process of its achievement. It may seem simplistic to talk of the most basic needs in an era of heightened technological growth and globalisation. But they warrant serious discussion because they are marginalised in the midst of claims of hi-tech achievements. The trickle-down effect of capital growth at the higher levels is to uplift the poor, but this has not happened in India.

When the government in India was a welfare state, there was planning for housing, health and education. But now, not only have these been manifestly abandoned, but anti-poor policies such as cutting subsidies for farmers, freedom to close industrial units employing less then 1,000 workers, and privatisation of rural education are also being implemented with great ease. Other than mass campaigns like polio eradication and mass literacy, government now has no concrete policies for the problems of food, shelter and health. In fact, government expenditure on education and health is said to have been stagnant in the past few years [Mehta 2002]. Liberalisation facilitates the unbridled pursuit of capital by the state as well.

If we consider ground realities with respect to basic needs in India we realise that it is the indigenous knowledge systems emerging from the people's own initiative and skill that have helped them till now. If houses were to be built only with cement and steel, 60 per cent of the population would be homeless, and if land could be cultivated only with chemical inputs, a similar proportion of the population would have go without food. People have for long conceived and used many technologies to solve their own problems [CTSTI 1995]. But they are now unable to sustain themselves in the face of the state-sponsored capital and technology-intensive methods of the present day.

Export-oriented growth does not pertain to capital and expertise alone, it draws heavily from state subsidies, raw material and resources from the environment, in the process eliminating indigenous initiatives which are also dependent on these resources. The frenzied pursuit of growth has consigned the stories of suicides among farmers to the inside pages newspapers.

I wish to place two points for consideration in this paper:

(1) Economic growth indicated in numerals need not always lead to development. In fact, it can pamper a few at the cost of many. When export-oriented growth becomes the goal of the state in a country like India, the poor and the voiceless are marginalised. Technology and capital-intensive growth is systemically ill-equipped to cater to the lowest segments of the heterogeneous Indian society;

(2) Indigenous systems are capable of providing a decent livelihood for the poorest sections of the people. This is a necessary precondition even for the fruits of modern technologies to reach them.

Though their strengths vary in different domains (such as health, architecture, metallurgy and so on), most indigenous knowledge also operates at the grass roots level; it is created, sustained and modified in the living experience of ordinary people. It is compatible with the economic condition of the people and as technology involves low capital outlay. It is eco-friendly and involves comparatively less wastage, and wastage, if any, is often recyclable. It caters to local markets and is therefore within the comprehension and control of the communities involved, unlike a situation where the village communities become susceptible to mega-market fluctuations which they do not even know of, leave alone control.

Indigenous knowledge is time-consuming, cumbersome and requires skill. It is also associated with caste occupations and social status. However, these problems are not insurmountable. Focused research involving the community and some positive policy interventions would help in handling them. Often the argument is made that indigenous knowledge is not economically viable. But many modern technologies imported today are not viable, are extremely expensive and sustained purely by state subsidy. Several impoverished village communities could get a new lease of life by reviving indigenous knowledge that would entail less than a fourth of the national expenditure incurred on hi-tech solutions.

I would like to place these arguments in the context of fieldwork data from Tamil Nadu on leather processing.

Historical Background

The leather industry has a long history in India, and especially in Tamil Nadu. Tanning is the process of converting putrescible animal hides and skins into leather thus preserving them from decay, through the use of vegetable or chemical substances [Sarkar 1997]. Traditionally the barks and pods of certain trees commonly available in the region were used for tanning [Edward et al 1952]. Vegetable tanning, dyeing and finishing were an ancient enterprise in Tamil Nadu, references to which are found in Sangam literature [Somanathan 1998].

During the 18th century, it was a cottage industry among the Chakkiliyar, a Telugu-speaking community in Madras Presidency[1] responsible for producing leather (by tanning hides and skins) and making articles out of leather. In the cities there was a demand for leather shoes, saddles and artillery for the generals and rajahs. In the countryside, it had a variety of uses

like irrigation bags, belts and harness for cattle, besides containers for transporting ghee and water. Skins tanned with the bark of the 'Aavaram' tree (*Cassia Auriculata*), were a specialty of this region.

Early British intervention in the leather industry lead to its urbanisation, involving social mobility for the communities involved in the profession and to improvements in the techniques of vegetable tanning [Roy 1994]. Reports by British officers like, Watt (1890) and Chatterton (1904) refer to the good quality of tannage of the vegetable tanning process practised in south India. The census records of the late 19th century show that more than 1,50,000 artisans were engaged in leather-goods manufacture alone. Assuming that each leather-goods maker earned three annas per day, Chatterton (1904) calculated that their total annual income would exceed Rs 1 crore and if the value of the leather they used was double their wages, then at least Rs 2 crore worth of leather was used in Madras Presidency during the early 19th century.

The raw material for the leather industry came mostly from dead animals. India had one of the largest cattle populations in the world and there was an abundance of raw material from fallen cattle that attracted British commercial interest. Raw hides and semi-tanned leather soon became important items in Indian exports to England in the early 20th century. Municipal slaughterhouses were started to augment the quality and quantity of hides available for tanning [Roy 1994]. Raw hides moved away from the village for export, thereby affecting the cottage industries of the natives.

> We thus see that the effect of foreign competition is double. It is drawing out of the country its stock of raw materials hides and skins, causing the price of what is left to rise very high. It is also supplying the market with manufactured articles, at such moderate cost that the prices of the indigenous manufactures must be lowered if the industry is still to be carried on by the natives [Chandra 1976: 104].

In order to strengthen the Indian leather industry weakened by the dearth of raw material and foreign competition, Alfred Chatterton, director of the department of industries[2] suggested the introduction of chrome tanning2 in Madras Presidency [Swaminathan 1992]. The British commercial lobbies opposed Chatterton's suggestion because they saw in it a threat to their interests in the leather industry. After prolonged debate, some tanneries in India resorted to chrome tanning around 1930. But even as late as 1952, prior to the state-sponsored launching of chrome tanning on a massive scale, 43 per cent of the hides in the country were processed by village tanners, according to the report on the 'Marketing of Hides in India, by the ministry of foods and agriculture (1952:56-57).

Modern Leather Industry

The modern leather industry is organised in various sectors, namely, semi-processing (can be done with chrome or vegetable tanning material), finishing and dyeing leather. There is also the leather goods manufacturing sector. Chrome tanning produced superior quality leather on a larger scale and was adopted in independent India without much fuss over effluent treatment facilities and protection mechanisms for labourers handling the chemicals. CLRI, a premier research institution was created in Chennai in the 1950s to facilitate research and large-scale manufacture of leather. However, chrome tanning was more or less stopped in western countries due to pollution problems and the lack of a labour force to handle the hides and skins.

A crucial turn in the Indian leather industry came with the implementation of the recommendations of the Seetharamaiah Committee in 1973, which banned the export of raw and semi-tanned leather and made it mandatory to export finished and dyed, that is, value-added leather. Tables 1 and 2 indicate the phenomenal increase in exports after 1974 due to the new export-oriented policy.

It was already well known that the chemicals used in finishing and dyeing leather were extremely hazardous.[3] Finishing and dyeing are banned in Europe and the US, because it is hazardous and unviable. The cost of finished leather turns out to be prohibitively high if effluent treatment was to follow reasonable standards of pollution control. As pollution control regulations in India are lax and the labour force is illiterate, it is a lucrative proposition for the exporters and a government hungry for foreign exchange.

Tamil Nadu has been a lead player in the leather industry throughout, contributing to more than 60 per cent of finished leather and leather goods exported from the country; 900 out of 1,083 tanneries are located in the state [CLRI 1985]. The industry has been concentrated for the past five decades in North Arcot and part of Dindigul district. The soil in these regions is totally unfit for any cultivation and the groundwater has been poisoned by chrome and lead effluents. Yet structural change was initiated in the Indian leather industry and 25 per cent cash subsidy was lavished on the exporters of finished leather. The consequences of the structural change were that the size of the units increased and about 6,000 vacancies were created during 1976-80 [Usha 1984]. Capital intensity increased, because finishing and dyeing were hi-tech operations involving imported chemicals. The value of leather exports multiplied from Rs 300 crore in 1980-81 to Rs 3,200 crore in 1991-92 [*The Economic Times* 1988] and Rs 4,889 crore by 1995 [*Express Investment Week* 1995]. This spectacular rise in foreign exchange reserves was accompanied by a progressive deterioration in the economic and physical health of the workforce and environment.

There are skilled and unskilled workers in the industry. The bulk of the unskilled labour is engaged in defleshing and dehairing the hides and skins and soaking them in chemicals. Unskilled workers who constitute the bulk of the labour force are employed only on a temporary basis [Nihila 1999]. Their wage rates were kept constant for several years. Their employment was also threatened when there was a fall in demand in the export market, as in 1975 [Usha 1984]. The workers handle dangerous chemicals with their bare hands and suffer from chronic respiratory and skin diseases; death rates are known to be five times higher among tannery workers. Men get Rs 40 and women get about Rs 15 for eight hours of work [Sujatha 1998]. Further, as Nihila (1999) notes, there is greater exploitation of women workers in the industry as they are employed in menial and hazardous jobs.

The social composition of temporary workers in the leather industry consists almost entirely (about 95 per cent) of Arundathiyars, formerly referred to as

Table 1: Export of Finished Leather from India

Year	Value of Exports (Rs mn)
1973-74	140.28
1976-77	1035.44
1980	2660.00

Source: Usha (1984).

Table 2: Export of Finished Leather from Tamil Nadu

Year	Value of Exports (Rs mn)
1973-74	86.04
1976-77	687.09
1980	991.67

Source: Ibid.

Chakkiliyars – the community traditionally engaged in leatherwork in south India. They are a scheduled caste community and their economic indices are now the lowest among scheduled caste communities in Tamil Nadu. Knowledgeable sources even within the modern industry have noted the enormous inequality and the marginalisation of the lower-level workers in the industry [Sinha and Sinha 1992].

In the leather goods sector, large units, whose output is only 24.1 million pairs of footwear per year, get policy boost for exports, while the small cottage units of leather artisans catering to the local market, whose output is around 155 million pairs [Sinha and Sinha 1992] get no credit or other facilities.

The government is now looking for more avenues to foster the leather industry in order to raise its share in global trade from 3.5 per cent to 10 per cent. But a cursory glance at the figures brings out the irrationality in the industry. Leather is India's fourth largest foreign exchange earner and Tamil Nadu contributes about 70 per cent of the export. Yet the condition of labourers in the industry is pathetic: they get Rs 50 or less per day and live in unhealthy conditions even as the industry fetches a hefty foreign exchange for the country. Obviously, no 'trickling down' has taken place.

More importantly, the environmental hazards and health problems posed by the industry are social costs apart from the costs of subsidy on capital expenditure incurred by the government.

Indigenous Technology

The appropriation of raw material from the local market is a major cause of the decline of the village tanner's profession in Tamil Nadu. This decline coincides precisely with the introduction of the state-sponsored hi-tech finishing and dyeing industry in the state. About 90 per cent of the Arundathiyars have become seasonal wage labourers in agriculture, temporary workers in tanneries and helpers in slaughterhouses. They do not hold any supervisory or technical position in the modern leather industry. Their wage is Rs 15 for eight hours of work in the drought-hit regions of Thirunelveli and Kanyakumari. In places like Salem, Chennai and other areas, they are employed as scavengers by the town municipality on a temporary basis. A study of 21 districts in Tamil Nadu indicates that less than 1 per cent of them had secured low-level government jobs [Sujatha 1998].

In parts of Dharmapuri district, they work as bonded labourers in the farms of the landed castes In the Pallavaram locality in Chennai, there is a 300-year-old settlement of Arundathiyars where animals are slaughtered in the open adjacent to living quarters and strewn with blood, bones and refuse from the nearby tanneries. Their houses lack ventilation and the children live and play outside.

The Arundathiyar's economic plight was not as bad prior to the 1950s because they were the only manufacturers of leather and leather goods both in urban and rural Tamil Nadu. But they have always been socially oppressed because of their contact with carcasses. Now they suffer from economic deprivation in addition to age-old social discrimination. Because most of them are not literate and are plagued by alcoholism, they have no place in the 'liberalised' modern society either.

Despite several obstacles, indigenous leather processing methods are currently practised in parts of Tamil Nadu where the modern leather industry is not present. It was the main occupation in 25 out of 200 villages in 1997-98 [Sujatha 1998].The village tanner earn Rs 2,500 per month on tanning 25-30 pieces. The village tanners are able to make a comfortable living with their income through tanning.

The bark of *Cassia Auriculata*, bark and pods of *Acacia Arabia, Cassia Fistula, Phylanthus Nizuri* and *Myrabolans* were some of the tanning materials used in various regions of Tamil Nadu. Cashew skin ('munthiri pottu' as it is locally called) is used only in Dindigul area to tan buff hides. There are other such tanning materials specific to certain regions. The colour and properties of the tan liquor depends on the vegetable material used and this again depended on the kind of hide or skin to be tanned.

The tan liquor, prior to soaking the hide, is of medicinal value for certain cattle diseases and is sought after by farmers. A variety of oils, fats obtained from vegetable, animal and marine sources were used to fat-liquor-processed hides and skins for shine and glow.

While the chrome-tanning effluents cause irreparable damage to environment and health, the effluents from vegetable tanning are not only eco-friendly but also re-usable. Even the non-usable effluents are biodegradable and are hence not harmful. The leftover tan liquor is allowed to evaporate and the sediment of vegetable matter with the proteins secreted from the hides and skins are highly valued manure for fields and are sold by the tanners to farmers at good prices.

The vegetable-tanned leather of the Arundathiyars is used for making agricultural implements like irrigation bags for drawing water from wells, harness for ploughs and straps for cattle. The leather is also used for making footwear. Footwear made of vegetable-tanned leather is said to be healthier and cooling to the body compared with chemically-tanned leather that could cause allergy. Besides, footwear made of vegetable-tanned leather is very popular among cattle grazers because it is strong, has a longer life, and protects the feet from thorn pricks and snakebites. This leather is ideally suited for bags used by bus conductors and medical representatives and for big and heavy files used in government offices. Vegetable-tanned leather has medical uses such as in the making of footwear for cracked feet. Pillow covers made of sheepskin and stuffed with medicinal herbs provide relief from headache and sleeplessness.[4] Even today there is local demand for goods made of vegetable-tanned leather.

It is true that a section of the Arundathiyar youth would like to relieve themselves of any association with leather and have managed to secure white-collared jobs. But a number of them are interested[5] in pursuing the profession if the obstacles are removed through government policies. If their living standards could improve by earning a steady income through vegetable tanning for a local market, literacy and thereby social mobility would become possible.

As an experimental effort, vegetable-tanned leather from various parts of Tamil Nadu were procured and supplied to leather goods makers from the cities. It was found that with some technical modifications, they could be of use in making strong and sturdy handbags, footwear, files, and belts.[6] The few Arundathiyar entrepreneurs in-

volved in vegetable tanning in Salem and Dindigul area are well off, have migrated to towns, their social status has improved and their children go to school. NGOs working with the traditional tanners in Karnataka and Andhra Pradesh have shown that vegetable tanning is viable and can empower the communities, especially the women engaged in it.[7] Linking the vegetable tanners to small-scale leather goods makers who are hit by the high prices of finished leather, would help solve the problems of both. Fortunately, modern tanneries are not rooted in these states and hence the availability of raw material is not a problem.

The protagonists of the modern, expedient technologies of leather processing argue that vegetable tanning methods are inefficient and are hence obsolete [CLRI 1985] and unviable. For them the only problem is lack of knowledge among the leather artisans, and they recommend training programmes in modern methods to upgrade their skills. But the turnover of students for these courses is very low because no community other than the Arundathiyars would opt for them and 85 per cent of the community is not literate. They cannot compete with the big players in the chrome tanning industry and hence have no mechanism to make a living out of the training imparted to them.

Besides chrome tanning is a capital-intensive industry requiring proper effluent treatment facilities that are not available in the cottage industry. In fact, the industry is facing severe problems in evolving economically feasible effluent treatment facilities even in the organised sector. Thus the modern leather industry is not sustainable even from the utilitarian view of greatest good of greatest number of people because it only ensures greatest good of the smallest number of people.

Another allegation is that vegetable-tanned leather is of poor quality compared with finished leather, which can be used for attires, jackets and soft purses. Quality is also dependent on the end user. If the end user is someone in Europe, for whose need we are going to destroy our environment, health and the livelihood of millions of poor people and fill the pockets of the capitalist businessmen, chrome tanning is efficient. If the end user is the average citizen who wants his/her money's worth when buying footwear or a bag, and if this need can be met by our leather artisans who can earn a decent living out of the profession without any damage to the habitat, then indigenous tanning methods are better. The question is what do we want?

While our aim is not to deride any system of knowledge or technology per se, it is important to consider the social and economic arrangement in which a given technology, indigenous or western, is sustainable. In this respect, indigenous technology in leather processing has a definite edge over the chemical method because it is sustainable at the grass roots level.

Promotion of exports and foreign exchange reserves to feed the needs of the bureaucracy at the cost of ordinary people and their livelihood is disastrous and unethical. The leather industry is a case in point. Reports of starvation deaths, malnutrition and suicides of weavers and agriculturists are steadily increasing in the country with the growth of global trade.[9]

> The current state of India's artisans is a matter of grave concern. [...]Though some have managed to adapt to changing times, and a few have even thrived, most of them live in abject poverty with no prospects for a better tomorrow [Satyanand and Singh 1995: iii].

This is not intended to convey that indigenous knowledge systems are a panacea for all problems of the poor, but that some indigenous knowledge systems can serve as stepping stones for impoverished village communities to achieve humane conditions of living that they can see what the modern world is like. EPW

Notes

[The author is thankful to K Kolanji and K Selvaraj, research assistants who conducted the field study for the report on Arundathiyars on which this paper is based.]

1 Chakkiliyar, whose community name is Arundathiyar from 1922, were, and continue to be an untouchable community in Tamil Nadu like their counterparts in other states working on hides and skins.

2 Chrome tanning was discovered in America in 1890.

3 'Report on Economic Analysis of the Costs of Pollution in the Textile Dyes and Leather Industry in Tamil Nadu', Madras School of Economics, 1998.

4 The medical value of vegetable-tanned leather is corroborated by Siddha practitioners in interior Tamil Nadu and the entrepreneurs manufacturing them receive orders for them from the locals.

5 Respondents expressed these views during fieldwork for the study on Arundathiyars mentioned above.

6 In the 'Exhibition and Workshop on Traditional Leather Industry' organised by the AU-PPST Centre at Anna University, Chennai in 1998.

7 See paper presented by Indo Dutch Project Management Society titled 'Leather and Women in Laxmeshwar' in the booklet of the 'Exhibition and Workshop on Traditional Leather Industry' organised by the AU-PPST Centre at Anna University, Chennai in 1998.

8 C A Shameful Hunger, *The Times of India* (editorial), May 11, 2001.

References

CTSTI (1995): Booklet of the Congress on Traditional Sciences and Technologies of India organised by Anna University, Chennai and PPST Foundation at Anna University, Chennai, December.

Chatterton, A C (1904): *Monograph on Tanning and Working on Leather in Madras Presidency*, Madras.

Chandra, R N L (1975): 'Monograph of Tanning and Working in Leather in the Province of Bengal' in *Art in Industry through the ages. Monograph Series in Bengal* (reprint) Navrang Publishers, New Delhi.

CLRI, (1985): *Development and Export Potential of India's Leather and Allied Industries*, Part I, Chennai.

Edward, M V, R L Bhadwar and A C Dhey (1952): *The Vegetable Tanning Materials of India and Burma*, Indian Forest Record Series, Vol I (2), Delhi.

The Economic Times (1998): 'Move for Threefold Increase in Leather Exports', March 13.

Express Investment Week (1995): 'By the Skin of Its Teeth', August 28-September 3.

Ganeshan, A (1995): *American Tanning Techniques*, Vol I, CLRI, Chennai.

Mehta, Vinod (2002): 'Spend more on health and Education, *The Navhind Times Economy Column*, Goa, July 22, 2002.

Nihila, Millie (1999): 'Marginalisation of Women Workers: Leather Tanning Industry in Tamil Nadu', *Economic and Political Weekly*, XXXIV (16 and 17), pp WS-21-WS-27.

Roy, Thirthankar (1994): 'Foreign Trade and the Artisans in Colonial India: A Study of Leather', *Indian Economic and Social History Review*, XXXI (4), pp 461-90

Sarkar, K T (1997): *Theory and Practice of Leather Manufacture*, C C S Press, Chennai.

Satyanand, Kanika and Sekar Singh (eds) (1995): *India's Artisans: A Status Report*, Society for Rural Urban and Tribal Initiative (SRUTI), New Delhi.

Sinha, Saurabh and Sanjay Sinha (1992): *Indian Leather Industry: The Challenge of Modernisation*, Oxford University Press, New Delhi.

Somanathan, N (1998): 'Leather Tanning Techniques of the Tamils of Sangam Society' in the *Proceedings of the Workshop and Exhibition on Traditional Leather Industry*, (pp 1-3) organised by AU-PPST Centre, Anna University, Chennai.

Sujatha, V (1998): 'Arundathiyars – The Traditional Leather Artisans in Tamil Nadu: A Techno-Economic and Social Study' unpublished Project Report sponsored by the Department of Adi Dravidar Welfare, Government of Tamil Nadu and carried out at AU-PPST Centre, Anna University, Chennai.

Swaminathan, Padmini (1992): 'State intervention in industrialisation – A Case Study of Madras Presidency', *Indian Economic and Social History Review*, 29(4), pp 479-506.

Usha, P (1984) 'Leather Industry of Tamil Nadu – Study of Structural Change with Special Reference to the 1973 Export Trade Control Policy, Unpublished PhD thesis submitted at Madras Institute of Development Studies, Chennai.

Watt, George (1890): *A Dictionary of Economic Products of India*, London.