

SUSTAINABILITY OF SMES ON ENVIRONMENTAL COMPLIANCE IN LEATHER INDUSTRY IN DEVELOPING COUNTRIES

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Abstract

Environmental laws define the scarcity of environmental resources they affect the factor endowment of a country and therefore its position in the international division of labour. There is now also a general agreement that applying the 'polluter pays' principle should solve environmental problems. As the burden of abatement increases, as measured by the ratio of abatement expenditure to sales, there is definitely an incentive for firms to either invest in cleaner technology or more efficient abatement technology. There is also evidence that taxes and charges, designed to internalise externalities can actually affect trade. It is interesting to know if the developing countries face particular market access problems in the face of stringent environmental standards and regulations. While it is true that stringent measures impose market access restrictions and cause limitations on competitiveness, this is much more widely felt by the developing countries because of lack of infrastructure and monitoring facilities, limited technology choices, inadequate access to environment – friendly raw materials, lack of complete information, presence of small-scale exporters and emergence of environmental standards in sectors of export interest to developing countries. The small and medium enterprises often divert sales either to the domestic market to external markets where environmental requirements are less stringent, in order to save on their costs. Whereas 80% of the industry is reserved for small and medium enterprises (SMEs) in the tanning sector from raw to semi-finished leather mostly processing less than 2 tons per day. In Europe and other developed countries the SMEs in leather sector have vanished due to strict environmental compliance and this will likely occur in developing countries also. The environmental compliance too has not always been practical, either because the laws are too ambitious or unrealistic in certain parameters, or because they have lacked effective instrumentation and institutional support. Some environmental regulations have not succeeded as they do not match the technical requirements and economic reality of the country or region, or because they do not take the institutional capabilities of the society that has to implement them into consideration. Whereas 80% of the industry is reserved for SMEs in the tanning sector from raw to semi-finished leather mostly processing less than 1 to 2 tons per day. For the survival and sustenance of the SMEs in the leather industry, it may be a viable alternative to carry out the tanning process in a decentralized fashion such that the raw to semi-finish process is carried out in the large scale sector while the semi-finished to finished process could either be reserved or open to competition as per the countries' requirements. But the issue of concern is whether it is fair that the raw to semi-finished tanning process, containing 70% pollution discharge should be undertaken by developing countries alone, especially if it is at the cost of their survival! However, the game analysed in the paper reveals that tanning units in developing countries would prefer to comply with the regulations and stay in the industry, the alternatives being to collude or to compete!

Keywords: BOD, COD, TDS, sustainability, end-of-pipe treatment, cleaner technology, payoff, collude, Nash Equilibrium

1. Introduction

Traditional industries such as leather, textiles etc. in many developing countries are in small and medium enterprises (SMEs). It is estimated that currently about 1.8 billion square metre of leather is made annually in the world. Bulk of the basic tanning process is carried out in developing countries: particularly in Asia & Africa. In a majority of the developing countries, the leather industry is characterized by small units with their typical problems of under utilization of process capacity, seasonal operations and unskilled workmanship. Stringent environmental standards such as COD - 150 to 250 mg/L; Total Dissolved Solids (TDS) - 2100 mg/L, etc. introduced by the regulatory authorities during the last one decade in the developing countries and the inability to comply with the environmental regulations has posed a serious threat to the existence, survival and sustenance of the leather sector specially to the SMEs.

The total processing capacity of the world tanning industry is more than 10 million tons of hides and skins per year. The estimated total wastewater discharge from tanneries is about 400 million cubic metre per year. The industry has gained a negative image in the society with respect to its pollution potential and therefore the leather processing capacity activity is facing a serious challenge. Though the contribution towards pollution load in terms of BOD, COD, TDS, etc. from the raw to semi-finish process is 70 to 80%, the value addition from the semi-finished leather is only 20 to 30%, the profit margin ranging from a meagre low of 5 to 10%. The cost of environmental pollution control measures is estimated to be in the range of USD 500-1000 per 1000 cubic metre of effluent.

In China, the processing capacity is around 10,000 tons/ day handled by 600 units. On the contrary, in India more than 2000 units process only about 3000 tons/ day. This shows that in India too small and medium units will disappear slowly to give birth to larger capacities.

2. Effluent Treatment Management

Pollutant waste discharges standards in most developing countries are rigid and disregard specific site conditions. Instead of gradual approach as called for, which would phase installation of treatment facilities (for example the physio-chemical first, followed by biological treatment and appropriate sludge handling), a small-scale unit is under pressure to put up a complete treatment system and meet all discharge limitations at once which is beyond his financial and technical means particularly in case of small scale isolated units without scope for mixing domestic water for combined treatment.

The tanneries in India and other countries in South Asia and Africa can be grouped into four major categories for effluent treatment management.

Large and medium scale tanneries with adequate land, finance and managerial capacity had to set up individual effluent treatment plants.

Tanneries located in clusters and do not have adequate land and financial/technical capability to set up individual effluent treatment units but feasible to set up Common Effluent Treatment Plant (CETP) had to provide CET system.

Cluster of tanneries in cities like in Istanbul & Izmir in Turkey, Kolkata (Calcutta), Jalandhar, Bombay in India, Colombo in Srilanka, Cairo in Egypt etc. where there is no scope even for a CETP due to non-availability of adequate land, public resistance from the surrounding area, other socio-economic aspects etc. had to relocate and develop separate industrial complex with CET system.

Scattered small-scale tanneries, which neither can set up individual effluent treatment plant nor be included in a planned CET system had to relocate and join one of the clusters with CET system or to close down.

3. Environment and Sustainability

It is very often overlooked that many industrial units have to be sensitized to the importance of pollution abatement, become aware of the potential and limitations of low waste processing methods, and be given the opportunity to learn how to deal with environmental issues. In this context, it is noteworthy that the production and processes employed in the manufacture of leather in several developing countries remain traditional, often not optimised for capacity, chemical and water usage. Tannery waste management has become a matter of increasing concern. The environmental compliance too has not always been practical, either because the laws are too ambitious or unrealistic in certain parameters, or because they have lacked effective instrumentation and institutional support. Some environmental regulations have not succeeded as they do not match the technical requirements and economic reality of the country or region, or because they do not take the institutional capabilities of the society that has to implement them into consideration.

For sustainable development, the leather & footwear industry will have to find technological solutions which meet the requirements of the international market, without leaving aside the preservation of the environmental new issues like ECOLABEL, ISO14001, etc. From the experience gained from other cysts, it has been realized that its not sufficient to meet the required pollution control standards with only “end-of-pipe treatment” technology, but there is also a need to incorporate “cleaner processing” in the production process itself. All this implies that the economics of production cannot be reached under these environmental regulatory pressures unless there is reduction at source, resource recovery and reuse, and waste minimization and reuse.

4. Game Analysis

We consider a condition in a developing country (India here) where there are two small-scale leather-processing units S_1 and S_2 , under identical technological conditions. Given that unit S_1 decides to compete, unit S_2 's payoff by following his strategy to compete would be 5, while his payoff from following his strategy to collude would be 10. On the other hand, if unit S_1 decides to collude, unit S_2 's payoff by following his strategy to compete would be 0, while his payoff from following his strategy to collude would be 10. Therefore, for any move by S_1 , S_2 's dominant strategy would be to collude. Now considering that unit S_2 decides to compete, unit S_1 's payoff by following his strategy to compete would be 5, while his payoff from following his strategy to collude would be 10. Similarly, if unit S_2 decides to collude, unit S_1 's payoff by following his strategy to compete would be 0, while his payoff from following his strategy to collude would be 10. This implies that for any move by S_2 'colluding' is S_1 's dominant strategy.

Therefore, the dominant strategy, and hence, the Nash equilibrium for either of the firms to follow (by which both of them would earn better payoffs) would be to cooperate and hence, collude. The payoff matrix for both firms, S_1 and S_2 is displayed below:

		S_2	
		Compete	Collude
S_1	Compete	5,5	0,10
	Collude	10,0	10,10

5. Relocation of Tanneries Experiences

In many relocation/ resettlement plans including that in Istanbul, more than 50% units have vanished and new medium and large scale units have emerged. According to the present Indian Environmental Pollution control regulations, the tanneries are obliged to set up effluent treatment systems either individually or collectively and the treated effluent shall meet the pollution control standards. Many developing countries follow the similar norms. In Kolkata city, there are about 540 operating tanneries in three clusters namely in Tangra, Tiljala and Topsia. Since there is no scope for providing individual units (ETPs) or common effluent treatment plants (CETPs) in the existing tannery clusters, a new leather complex called Calcutta Leather Complex (CLC) is being developed about 20 km from the Kolkata city. All units including unorganized small-scale units have to establish their units in an organized way in the Leather Complex and contribute to the environmental protection measures. This may not be feasible for many of the small-scale units with processing capacities of less than 2 tons/ day. Therefore, referring to

the case of Istanbul, as is evident from the game analysis also, Kolkata may have to end with a similar situation where either the small-scale units may have to collude to survive, or exit the industry.

6. Conclusion

In the present scenario, 80% of the tanning industry is reserved for SME's processing raw to semi-finished leather mostly processing less than 2 tons per day. In Europe and other developed countries the SME's in leather sector has vanished due to strict environmental compliance and this will occur in developing countries also. However, to make the picture more realistic for survival and sustenance of the SMEs in the leather industry, it may be a viable alternative to carry out the tanning process in a decentralized fashion such that the raw to semi-finish process is carried out in the large scale sector while the semi-finished to finished process could either be reserved or open to competition as per the countries' requirements. But the issue of concern is whether it is fair that the raw to semi-finished tanning process should be undertaken by developing countries alone, especially if it is at the cost of their survival! However, the game analysis shown above would reveal that tanners in developing countries would prefer to comply with the regulations and stay in the industry, the alternatives being to collude or to compete!

References

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