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LESSONS FROM EMPIRICAL STUDIES:

The case of India

Synthesis report by the UNCTAD secretariat

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I. INTRODUCTION

1. The Marrakesh Agreement has opened up new opportunities for Indian exports, particularly in the areas of textiles and certain agricultural items¹. However, in India, there is a growing concern that part of the benefits of freer access to the OECD markets may be undermined by non-tariff barriers in the form of stringent and sometimes seemingly arbitrary environment-related regulations. Export growth could also lead to increased pressures on the environment at home, but domestic environmental problems may or may not correspond to ecological preoccupations in developed nations. Given scarce funds, there may be a trade off between addressing developmental issues and domestic ecological concerns, and investments in specific environmental improvements in response to external environmental regulations.

2. In the framework of the UNCTAD/UNDP project on "Reconciliation of Trade and Environment Policies", two case studies were carried out to examine the linkages between trade and the environment from the perspective of India. The first study, "Trade and Environment Linkages: A Case Study of India", was conducted by Jyoti Parikh, V.K Sharma and Manoj Panda at the Indira Gandhi Institute of Development Research². It surveyed 30 representatives from pertinent industries, export promotion councils and government organisations in order to gain an understanding of the level of awareness among the manufacturers and exporters of eco-standards, and the cost of compliance with external regulations on Indian exports.

3. The second study, "Impact of Environmental Standards and Regulations On India's Exports", carried out by Vasantha Bharucha, examined readily available reports/papers on the issue, conducting also a detailed questionnaire-based survey and discussions with a number of industry representatives and institutions in relevant sectors³. The sectors surveyed were tea, dyes, agricultural products and processed foods, marine products, leather, textiles and the refrigeration and air conditioning industry. This report, prepared by the UNCTAD secretariat, presents a synthesis of the two studies, while also drawing on other sources⁴.

4. The main conclusion emanating from the studies is that compliance with external eco-standards often necessitates the import of inputs and technology, which are likely to raise the cost of production, and thus the price of the final output. Since competitiveness of many Indian exports is based mainly on price factors, such a price rise could hamper India's competitiveness in several industries under study.

5. Both studies were, however, of the opinion that Indian exporters would be better off complying with the environmental requirements in the near future, since otherwise they may lose a significant market for their products. The studies stated that, although costly, this was achievable through a well defined policy structure to address issues relating to trade, development and the environment.

II. SPECIFIC PROBLEMS OF INDIA AND STRUCTURE OF INTERNATIONAL TRADE

6. Import of raw materials and capital goods, coupled with poor foreign exchange earnings in India had resulted in a chronic balance of payment problem. Low levels of productive investment, and the consequent unemployment and domestic inefficiency have been some other features of the Indian economy.

7. These, among other factors pushed India towards a substantial change in policy in 1991. Liberalising the economy entailed the promotion of exports of a variety of goods and incentives to attract Foreign Direct Investment (FDI). In 1993, the exchange rate was made convertible for trade purposes, a major deviation from the entirely regulated exchange rate system in the past. Of particular relevance in the context of trade and environment linkages is a significant reduction in tariffs on selective capital goods and inputs, which may facilitate the import of eco-friendly technologies and inputs at prices which don't significantly harm competitiveness.

8. The forces of liberalisation have unleashed several factors which are relevant to the issue of trade and environment. Exporters, while interacting with the OECD market, are exposed to eco-regulations. If they are successful at acquiring the eco-technology and adapting to these eco-standards, it would improve the possibility of earning premium prices.

9. On the other hand, complying with the regulations may involve adopting production and process methods which raise the cost of production, thus making the final product relatively less price competitive in segments of the international market where competition is based largely on the ability to sell at low prices, particularly if the prices of competing products are not similarly increased. In addition such a price rise could, if not matched by increases in prices of goods produced purely for the domestic market, make the product unattractive for the domestic consumer. Exporters might then need to rely heavily on the export market to recover the cost incurred in environmental improvements.

10. For several decades, the Indian government has emphasised growth through import substitution, relating to a large extent on the import of capital goods. Machinery has therefore been a major import in this country. Besides machinery, fuels, manufactured goods, food and agricultural produce have been main imports. It is to be noted that the share of food and agricultural products in total imports declined from nearly 28 per cent to 6.5 per cent over a period of eighteen years 1975-1993 (See Table 1).

11. Food and agriculture also form an important part of exports from India. Recently, an attempt is being made to widen the range of exports, resulting in the promotion of high-value-added items such as processed agro and marine products in the export basket. This is perhaps reflected in the growth in the food and agriculture segment of exports in the last three years (See Table 1). India has also successfully exported textiles, food and agricultural products, and leather. In 1993, for instance, these three items accounted for close to half of all exports, in value terms.

Table 1

Total exports and imports by main commodity groups, 1975-1993
(millions of dollars)

Commodity Group:	1975	1980	1985	1990	1991	1992	1993
Imports: (in value)							
Total	6289.5	13818.7	16223.6	23798.7	19509.1	24206.0	23058.3
Food and agr. prod.	1750.9	1482.4	1920.3	1720.4	1135.3	1825.2	1508.5
Fuels	1418.6	6167.6	4297.8	6495.9	5839.7	7215.4	6290.9
Ores and metals	273.8	819.4	1138.3	1921.0	1236.6	1609.6	1217.6
Manufactured goods	2836.1	5346.9	8824.3	12185.8	9736.0	12065.3	12351.9
(share in percentages)							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food and agr. prod.	27.8	10.7	11.8	7.2	5.8	7.5	6.5
Fuels	22.6	44.6	26.5	27.3	29.9	29.8	27.3
Ores and metals	4.4	5.9	7.0	8.1	6.3	6.6	5.3
Manufactured goods	45.1	38.7	54.4	51.2	49.9	49.8	53.6
Exports: (in value)							
Total	4354.8	7510.6	8949.5	17858.8	17873.0	20679.4	22206.5
Food and agr. prod.	1817.0	2490.9	2522.3	3505.4	3361.0	3675.9	4167.2
Fuels	38.7	32.4	540.4	522.1	422.3	581.7	495.8
Ores and metals	537.2	563.3	677.2	921.4	951.4	882.3	821.9
Manufactured goods	1953.0	4404.3	5200.2	12624.1	12875.5	15202.6	16377.4
(share in percentages)							
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food and agr. prod.	41.7	33.2	28.2	19.6	18.8	17.8	18.8
Fuels	0.9	0.4	6.0	2.9	2.4	2.8	2.2
Ores and metals	12.3	7.5	7.6	5.2	5.3	4.3	3.7
Manufactured goods	44.8	58.6	58.1	70.7	72.0	73.5	73.8

Source: COMTRADE, UNCTAD.

Note: Food and agricultural products consist of SITC 0+1+2+4 less (27+28); Fuels consist of SITC 3; Ores and metals consist of SITC 27+28+68; Manufactured products consist of SITC 5+6+7+8 less 68.

III. DOMESTIC REGULATION

12. The environmental concerns and priorities of a low income nation like India with mass poverty are very different from those in developed countries. While problems of global warming, ozone layer depletion and loss of biological diversity are emphasised by the industrialised world, the concerns in India centre around poverty alleviation, and development. The immediate ecological concerns which need addressing here are contaminated drinking water, inadequate sanitation facilities, and smoky indoor air.

13. In accordance with its priorities, the Government's focus has largely been on domestic sustainable development. For instance, benzidine dyes have been banned in India because of local concerns about their effects on health, rather than through overseas pressures, although this would benefit the export of dyes to OECD markets too.

14. Concern for the local environment has led to several environmental regulations like the Water Act of 1974, the Air (Prevention and Control of Pollution) Act of 1981, and the Environment (Protection) Act of 1986. The Ministry of Environment and Forests is the enforcing authority which also implements changes in the regulations.

15. However, there are some other regulations which have been designed to deal with local as well as international ecological concerns. The leather sector for instance, has come under some strict regulations from the government owing to both domestic concerns, as well as those of importers of Indian leather. For

one, new tanneries are required by law to treat their effluents. Common Effluent Treatment (CET) plants are being set up for this purpose. Another regulation in this sector has been the ban of pentachlorophenol (PCP), which is used as a preservative/fungicide for raw hides and skins.

BOX 1

The Indian Leather Industry

The leather industry is one of the oldest and fastest growing industries in India. However, the potential environmental impact of the leather industry could be significant. In addition to the traditional problems of air and water pollution, there are other concerns like chemical safety, contamination of land and ground water, inadequate provision for solid waste and sludge disposal, and spills and accidents involving chemical substances. In one state, Tamil Nadu, workers suffered from skin disorders because of poor safety measures.

Technical development has resulted in the availability of relatively less polluting tanning processes. However, many obstacles remain in the way of widespread and effective introduction of these technologies, the most significant being high capital costs and maintenance costs. The government is beginning to play an active role in setting up Common Effluent Treatment (CET) plants. In some cases, joint collaborations are being set up. For instance, UNIDO, with several Indian institutions has jointly set up CET plants in Tamil Nadu, with the aim of treating effluents from a cluster of about 100 tanneries.

In the northern city of Kanpur, which has the largest concentration of leather processing in India, large amounts of waste get discharged into the river Ganga. To address this ecological problem, an ambitious Indo-Dutch collaboration is underway. As part of this project, tanners, the Indian government and the Dutch government jointly finance the scheme. The idea is that composite wastes from tanneries be mixed with domestic sewage, and jointly treated to reduce the Biological Oxygen Demand (BOD) load. This project thus has the added advantage of improving the physical infrastructure of the nation, along with reducing effluents.

Even with such collaborations the cost incurred for setting up CET plants and the cost of operation are very high. One study estimated that the cost of treatment of waste water for the 500,000 tonnes of skin and hide processed each year to be over US\$ 15 million- an additional burden on Indian tanneries, which is likely to be reflected in the price of the final output. For exporters, particularly small and medium sized enterprises (SMEs), these cost increases may affect their competitiveness.

16. In the area of agricultural production too, domestic regulations have been aimed largely at both local consumers and the international market. Although pesticides and chemicals are perceived as essential for increasing the productivity level in the agriculture sector, the government is attempting to curb the usage of those chemicals which are deemed harmful from the health point of view.

IV. EFFECTS OF ENVIRONMENTAL REGULATION ON TRADE

17. After the disintegration of the former USSR, India has turned increasingly to the OECD for its export markets. In 1993, OECD markets accounted for 57 per cent of India's exports. The main products absorbed by this market are leather, textiles and food and agricultural products (See Table 2).

Table 2

India: Exports by commodity groups and markets, 1993
(millions of dollars)

	World	OECD countries				Develo- ping coun- tries
		Total	of which:			
			United States and Canada	European Union	Japan	
Total	22206.5	12389.5	4215.3	5797.4	1740.2	8018.6
	4167.2					
Food and agr. products	821.9	1871.7	465.9	867.3	494.7	1878.6
Ores and metals	16377.4	448.7	15.9	127.9	294.0	349.2
Manufactured Goods		9776.4	3604.5	4665.3	941.7	5654.0
of which:	1632.8					
	540.8			412.9		
Chemicals	5893.5	710.8	201.8	334.1	39.1	705.6
Leather		416.7	53.2	2404.7	7.5	93.5
Textiles		4297.6	1362.7		208.3	1251.7

Source: COMTRADE, UNCTAD.

Note: See table 1. 1) OECD does not include Austria, Iceland, Mexico, Norway, Turkey.

18. The vulnerability of Indian exports to OECD environmental regulations has increased significantly because of the increase in the total share of exports going to OECD markets. Indeed in 1993, the share of OECD markets in the major exports of India ranged from 60 per cent in the case of dyes and pigments to 85 per cent in the case of leather and leather products (See Table 3).

A. Mandatory external regulations

19. Whether or not mandatory external regulations affect the market for Indian exports will be determined by the cost of compliance and the level of technological upgradation required, coupled with the pricing strategies of competitors, which may also be adapting to environmental regulations, for the same or competing goods. The following section summarises the findings of the studies in this regard, while also discussing the efforts being made, both by individual firms and the government, to comply with the regulations. The section focuses on German laws, largely because this one country accounts for about 14.5 per cent of all exports from India, which are vulnerable to external environmental regulations. Within the European Union, this one country alone accounts for almost half the exports of sensitive products. Among sensitive products, about 30 per cent of leather and footwear products and about 16 percent of textiles go to Germany.

20. Regulations on dyestuffs affect both the textile and the leather sector directly, since both these sectors have encountered cost increases in an attempt to conform to eco-standards of this intermediate product. The use of certain dyestuffs such as cobalt blue and sulphur black has been banned in external markets. Complying with stipulations regarding the toxic content of dyes may be difficult and expensive.

Table 3

**India, 1993, Export of Products Which Are Vulnerable to Environmental Requirements
(millions of US dollars)**

Commodity Group	World	OECD countries ¹				Developing countries
		Total	United States and Canada	European Union	Japan	
Total	100.0	57.0	18.0	26.1	7.8	36.1
Marine Products	100.0	82.9	12.4	24.8	45.2	16.9
Fruits	100.0	65.5	27.9	26.8	5.1	31.9
Vegetables	100.0	75.7	21.4	32.9	3.3	20.6
Leather and leather products	100.0	84.8	17.1	58.9	1.5	11.7
Footwear	100.0	79.6	29.0	45.5	0.8	8.2
Textiles	100.0	73.3	20.5	39.6	3.6	22.8
Dyes&Pigments	100.0	60.1	21.2	32.4	1.6	39.3

Source: COMTRADE, UNCTAD.

Note: 1) see note table 2.

21. In the case of sulphur black, a by-product of maize starch has been identified as a viable substitute. For cobalt blue, however, technology change in the manufacturing process was found to require a heavy investment of over US\$ 13 million⁵ at the firm level, owing mainly to the change in technology, particularly the establishment of secondary treatment plants in order to obtain the requisite quality, and investment in automatically controlled instruments for monitoring purposes. Such adjustments were found to be close to impossible for small scale producers of dyes, which form a significant portion of dyestuff suppliers.

22. Switching to non-benzidine dyes too would imply higher costs. One study estimated that the cost of direct black 38 dye was about \$3 per kilogramme whereas direct black 22, which does not use benzidine, was priced at \$8-10 per kilogramme. In the case of textiles, for example, raw materials, of which dyes are a significant proportion, account for about 60 per cent of the cost of production⁶. Regulations pertaining to dyes are therefore likely to increase significantly the cost of producing textiles.

23. If SMEs are required to comply with stringent external regulations, adjustment costs per unit of production output may be particularly high. In sectors where SME participation in exports is high, the effects may be significant. While exact numbers on their contribution to export in the dyestuff industry are not available, one study does estimate that over 60 per cent of the production in this sector comes from SMEs⁷. One can therefore extrapolate that an important part of exports could be coming from SMEs, and would be affected by external eco-regulation, particularly because the compliance costs are likely to be high.

24. Leather is one of the most affected sectors among Indian exports. Besides stipulations on dyes, several other regulations may affect trade. Germany in particular, has banned the use of pentachlorophenol (PCP), while in the EU, the permissible level is 1000 parts per million. Germany and some other countries limit the use of formaldehyde. The use of other environmentally friendly chemicals has also become mandatory, restricting the process by which leather may be manufactured⁸.

25. Presently, most of the tanneries are resorting to the use of an imported substitute of PCP, BUSAN 30, which is acceptable to the external markets. On an average, the price of this substitute is ten times higher than the price of PCP⁹. Even though all chemical inputs together account for about 10 per cent of costs, complying with eco-regulation is likely to affect the price competitiveness of Indian leather as the profit margins in this industry are very small.

26. One of the studies¹⁰ reported that adhering to stringent external standards may substantially increase costs. One of the concerns expressed by exporters was that even among imported dyes, the exact chemical composition was not always known, as it might be a closely guarded trade secret. Therefore, even incurring this extra cost would not necessarily guarantee entry into the more stringent OECD markets. Overall, exporters stated that the cost of replacing all chemicals with eco-friendly ones may raise the cost by 10 to 15 per cent¹¹. In addition, it was reported that testing the product through various stages of its life-cycle could increase costs by about 50 percent.

27. For individual SMEs, the cost of compliance to the standards and testing would be especially relevant in the leather sector, where SMEs provide about 70 per cent of the total exports from India¹². Considering that these units face problems of accessing finance and technology to begin with, they are likely to be most affected by the external eco-regulations prevailing in the leather sector.

28. In addition to the stipulations pertaining to dyes, several other regulations are also imposed on textiles and garments being exported to the OECD markets. Statutory measures also require that consumers be protected by compulsory labelling concerning formaldehyde. In addition, a ban has been issued on the use of some substances which have been identified as carcinogenic or allergenic.

29. As in the case of leather, an important part of ready made garment exports come from SMEs. According to one estimate, SMEs contribute as much as 63 per cent to the total exports from this sector¹³. Hence, a high proportion of the industry may face severe difficulties in complying with external regulations with respect to the quality of dyes in textiles, as well as regulations pertaining to other chemicals.

30. Furthermore, German authorities have begun subjecting garments from India to extensive tests for traces of certain chemicals. It is expected that producers, suppliers or traders will now have to provide a declaration that these chemicals are not present in their merchandise. The declaration will be binding and allow German importers to reject goods demonstrating traces of these chemicals without any legal recourse for the Indian exporter.

31. Considering that about 40 per cent of India's textiles go to the European Union, the steep compliance cost is likely to affect India's textile export to this market, where its competitiveness is determined by its ability to sell at lower prices (See table 3). Therefore, the study expresses the concern that the potential gain from the textile negotiations concluded at Marrakesh may be diminished if compliance with eco-regulations becomes a necessary condition for market access.

32. Indian tea has been affected by the developed countries' preoccupation with pesticide content. Germany, for example, has made complaints about the high residue levels of Ethion, Tetradifon and Heptachlor in Indian teas. Complaints have also been received from other OECD importers about Assam, Terai and Booras tea containing high levels of Bicofol.

33. After studying the impact of eco-regulations on Indian tea export, the government has banned 12 hazardous pesticides, and has restricted the use of some less hazardous pesticides. Steps are also being taken to encourage organic farming, so that Indian tea and agro products become more acceptable on the international market, while also benefitting the domestic consumer.

34. While the government has been attempting to regulate tea production, problems remain in the area of testing. Government officials contacted in the survey stated that while imposing bans on pesticides and issuing guidelines for tea growing was possible, lack of testing facilities were an important handicap in producing eco-friendly tea.

35. Although figures on incremental cost were not available for the tea industry, exporters did state that adopting eco-standards on a large scale would increase the cost of production significantly enough to affect their position in the world market. Considering that India's competitiveness in this market depends on its ability to sell at low prices, complying with eco-regulations may imply a loss of market shares, particularly

if competitors do not face similar difficulties in adapting to external regulations. Where complying may be more rewarding is in the case of high value Darjeeling tea. Being a premium tea, it is more likely that the cost increase owing to compliance is likely to be compensated by a price premium.

36. Both Japan and the European Union have strict regulations in food processing. In Japan, the Food Sanitation Law prohibits the import of many citrus fruits from India such as carambola, pomegranate, passion fruit, etc. The Residue Standards of Agro Chemicals law, applicable to nuts, sets limits to the extent of use of at least 22 pesticides.

37. Agro products also come under strict supervision in the European Union where all imported food products exported are liable for inspection at the first point of entry for compliance with the food laws pertaining to the country of entry. The regulations here also stipulate conditions regarding labelling of the use of packaging materials in the export products.

38. In one State in India, attempts were made to substitute DDT with the more eco-friendly pesticide, Malathion. The resulting cost of adopting the more acceptable pesticide was found to be four times the original cost, increasing substantially the burden on the exchequer, which is already subjected to a shortage of funds. At the same time, the adjustment to eco-friendly production in this sector would have to be quick to fully exploit the prospects of enhanced agro-exports in the post Uruguay Round period.

39. Dramatic reduction in the pesticide content in food production are also difficult from the point of view of development and growth. In India, great emphasis is laid on increasing the productivity of horticultural products, which is achieved through the extensive use of pesticides. Increased pesticide use is, however, not compatible with the requirements of importing markets in the OECD. If organic farming is pursued, in accordance with international eco-standards, the price competitiveness of Indian agro-products is likely to be seriously affected.

40. Marine products are another environmentally group of products vulnerable to external environmental regulations. The EU, especially Germany, has taken the lead in defining environmental product standards related to fish and fish products. The most important standards relate to the cadmium, mercury and lead content in fish. The European Union directive has also imposed process standards on strict hygiene requirements during handling, processing and storage of marine products.

41. Japan's laws with respect to shrimps, a major export from India, pertain mostly to the level of pesticide and antibiotics content in the exported fish. All types of antibiotics and oxolinic acid and oxytetracyclines are banned; even though there is no fixed limit, if traces of the above are detected, the shrimp consignment is liable to be rejected. Similarly, if traces of pesticides including DDT, Aldrin and Heptachlor are detected, the consignment may be rejected.

42. To promote Indian seafood in the international market, the Government has introduced several regulations aimed at quality control and standardization in the private processing facilities. Frozen fish and fishery products are subject to quality control and inspection prior to export, depending upon the stipulations made by the importer. Without a certificate of inspection, the export of frozen marine products is prohibited.

43. Exporters of these products stated that long wait for the testing and certification could compromise the freshness of the product. Since Marine products are perishable items, there is a trade off between testing for eco-friendliness and the perishability of the product.

44. Regulations concerning packaging materials, product charges, deposit-refund system and take back obligations have been put in place in the OECD countries. The most comprehensive legislation available today appears to be the German Packaging Ordinance, which holds manufacturers and distributors responsible for taking back used packing.

45. Most Indian exporters are subject to these packaging laws if they are exporting to OECD nations, since all exports involve packaging. Furthermore, packaging materials which are of relevance to India, for instance jute, may be affected by the newly enacted packing regulations, mainly because German consumers are not sufficiently familiar with it and it may be difficult to recycle.

46. Recently, bulk drugs were not accepted in Germany because the plastic containers were made of non-recyclable materials¹⁴. Exporters are making serious attempts at conforming to the standards stipulated for packaging so as to avoid a similar fate.

47. In the textile sector, packaging materials, such as poly vinyl chloride (PVC) and high density polyethylene are being replaced by cardboard. Similarly, stiffeners in yarn bundles and garments and other packaging materials are being replaced by cardboard. Exporters interviewed stated that the incremental cost of changeover to environmentally friendly packaging was 2 per cent to 3 per cent of packaging costs¹⁵.

48. Packaging laws in the OECD also affect the leather industry since this sector uses packaging materials both for individual pairs of shoes, as well as for bulk packaging. Some exporters contend that for leather and leather products, the cost of packaging to a stringent market such as Germany was twice the usual packaging cost incurred by tanners¹⁶.

B. Voluntary measures

49. Along with statutory eco-standards, criteria are also being set in the importing countries, through eco-labelling. In the EU, several labelling systems have developed eco-criteria relating to process and production methods (PPMs). For example, in the case of textiles eco-criteria relate to pesticide content in cotton, chemical usage in bleaching, dyeing and finishing, all of which relate to PPMs.

50. Several problems have been reported by the Indian textile exporters in complying with these eco-criteria. For one, the loss of productivity associated with growing organic cotton may not be compensated by the price premium associated with eco-friendly textiles. The case of organic cotton growing, like organic food crops discussed in the section on food processing, reflects a trade-off between productivity and eco-friendliness.

51. In addition, exporters were of the opinion that the eco-criteria on chemical usage would necessitate the import of a number of chemicals, while also requiring additional know how in the usage of these chemicals. These were estimated to increase fixed costs by 10 per cent and variable costs by 15 per cent¹⁷.

52. Such costs are particularly onerous for SMEs. Even among larger exporters, complying with the prevailing eco-criteria is not sufficient because markets where there may be price premiums constitute only about 25 per cent of the European market, where the competition to capture this share of the market is intense. Hence, the incremental cost of adherence to eco-criteria may be difficult to pass on to the consumers.

53. At the same time, if production lines are adjusted to accommodate such methods of production, the price hike in the final product may affect other international markets for Indian textiles, where exporters depend significantly on their ability to sell at lower prices. Exporters interviewed in one of the studies felt that such a price rise would severely affect the rest of their markets, particularly the domestic one¹⁸. The costs involved in making the above adjustments would also be impossible for small producers to meet, who, as stated earlier, contribute substantially to the textile sector. Therefore, compliance with eco-labels in the textile sector may be difficult.

54. In leather products, the Indian industry reported that eco-labelling may involve significant cost increases and may act as a non-tariff barrier¹⁹. Exporters of leather also felt that inadequate information may make compliance difficult. At the same time, there was little technical and financial assistance to help leather exporters to benefit from the opportunities offered by price premiums in this sector. A case in point is the

technology for testing. While efforts are being concentrated on developing a number of testing facilities, with the collaboration between the Indo-German Export Promotion Project and the Central Leather Research Institute, they are by and large inadequate.

55. Indian leather exports are rendered even more vulnerable because of the high costs for the verification of compliance with the eco-criteria in different importing countries. In the case of footwear, for example, a rough estimate of the incremental costs of adjustment indicates that the cost of compliance with eco-labelling would be about 33 per cent of the present export price, affecting India's price competitiveness directly, to an extent depending on how much prices of competitors change in response to adjustment to meet environmental criteria.²⁰

56. The Indian government has also introduced a voluntary system of eco- labelling, known as the Ecomark. The criteria for obtaining this label are currently being established, and collaboration with a British labelling agency is under way to make India's Ecomark so rigorous that it gains acceptability in the international market.

C. Response to external regulations

57. Part of the vulnerability of exporters is simply owing to the lack of information about environmental requirements. One of the studies indicated that nearly all the big exporters were quite familiar with environment related product standards in the OECD market. Exporters to Germany, in particular, were well informed, especially those in the textile and leather sectors. Information regarding eco-regulations and labelling came mostly from the importer.

58. The larger exporters were found to be in a better position to adapt to international regulations. A case in point was a firm in the automobile industry. Telco, a car exporter to the European Union, upgraded all its existing technology and ascertained that all the component manufacturers did the same. The information required was supplied by a technical consultant, while the changes were carried out by the firm alone.²¹

59. The awareness and adaptability of small exporters was lower than that of large ones. In the Indian context, the constraints experienced by such exporters is of significance because they contribute significantly to exports. In 1991-92, for example, the share of small and medium enterprises (SMEs) was almost 32 per cent (See Table 4). Problems affecting the export sector are likely to hit SMEs more significantly because of their inability to acquire information and the lack of financial backing to adapt to the external eco-regulations in importing markets.

60. If the environment-related standards did not have direct and immediate effects on SMEs, they would be ignored particularly in the dyestuff sector. This would make exports from this sector vulnerable to external regulations to a far greater extent than that of the larger, organised sector.

61. In the leather sector, too, the small scale tanneries were found to have little awareness of eco-regulations. In fact, it was difficult to convince them to adopt the cost effective CET and the government had to intervene with regulations and financial support in order to enable them to move to higher environmental protection.

Table 4

The Export Contribution of SMEs 1982-92

Year	SME share of total exports
------	----------------------------

1982	26.5
1983	22.9
1984	21.9
1985	22.1
1986	25.4
1987	28.9
1988	27.8
1989	27.0
1990	27.6
1991	29.7
1992	31.7

Source: ESCAP, 1995²²

62. The survey reported in the study revealed that lack of information through a centralised agency may have inhibited the capacity of SMEs to comply with eco-requirements. Attempts are being made by the Bureau of Indian Standards to provide corrective measures in the form of relevant details to smaller manufacturers and exporters.

63. For further growth, awareness and adaptability to external eco-regulations will be essential. Several sectors are vulnerable to these regulations, but have not yet been affected by them in a significant manner. However, as exports grow they are likely to become more immediately affected. In such a situation, firms are better off taking pro-active measure, even if the initial cost of adjustment is high.

V. Multilateral environmental agreements

64. Besides eco-standards in importing countries, India's growth and development will also be affected by the Multilateral Environmental Agreements (MEAs) in which it participates. For example, it is a signatory to the Basel Convention and Montreal Protocol and its subsequent London amendment.

65. India is a signatory to the Basel convention on transboundary movement of hazardous wastes and their disposal. According to a position paper prepared to the third meeting of the Conference of Parties to the Basel Convention, 18-22 September, 1995, however, India opposes the ban on the import of scraps. The use of recycled scrap may be more eco-friendly while also being more cost effective than the production of virgin metal. In fact, according to the Indian Non-Ferrous Metals Manufacturers' Association, 45 percent of India's metallurgical industry is based on recycling of scrap in about 5,000 plants employing close to half a million people²³. Importing scrap is therefore of great importance in the Indian context. The metallurgical industry states that if a ban is imposed on the import of scrap, it may be significantly harmed.

66. In addition, the Indian position paper strongly advocates international monitoring to prevent the illegal trade of hazardous materials which can damage its environment and result in loss of productivity and competitiveness. In this context, it is also of the opinion that exporters should be held liable for illegally dumping hazardous wastes, and provisions be made for compensating the damage.

67. Under the Montreal Protocol, India has agreed to phase out the production and use of CFCs by the year 2006, having received a grace period of ten years since India is a small consumer of CFCs (the annual per capita consumption was about 0.11 kilograms in 1990). As part of the London Amendment, it has also ratified the gradual phase out of Carbon tetrachloride and other fully halogenated CFCs, Methyl Chloroform and HCFCs over time. So far, information is available only on the impact of phase out of CFCs.

68. For India, the phase out of CFCs takes on a greater significance because unlike many developing countries, it is a producer of this substance. The competitiveness effects will be also be felt by the manufacturers of products using the controlled substance. Research and development costs will also rise, as

will the cost of the final products such as refrigerators and air conditioners. Indirectly, industries such as agro and marine products too would be affected because of their large scale use of refrigeration.

69. Adjustment Costs were calculated by some studies (see below) in terms of costs incurred by producers of CFCs, industries which use CFC as an input, and consumers of final products. Therefore, the latter two make up the consumers of CFCs. Expenditure on Research and Development geared towards the development of potential substitutes to CFCs are another adjustment cost taken into account.

70. A Task Force established by the government has assessed the incremental costs of adhering to the Montreal Protocol. Besides this report, two other studies have estimated adjustment costs, envisaging two scenarios, one where the phase out would take place early, and the other, where it would occur towards the end of the phase out period. An early phase out would mean replacing CFCs as soon as possible, instead of using the installed capacity until all plants are paid off. A later phase out, on the other hand would imply unconstrained growth of CFC production and consumption until the final date of phasing out.

Table 5
Adjustment Costs for India in Implementing the Montreal Protocol
(in million US\$ Net current value)

	Early phase out				Late phase out			
	Producers	Users	Consumers	Total	Producers	Users	Consumers	Total
World Bank ⁽¹⁾	192	68	60	320	82	50	350	482
MEF ⁽²⁾	120	40	147	307	43	37	620	703
Task Force ⁽³⁾	-	-	-	1400	-	-	-	2450

Note: (1): Estimate of the World Bank, 1991.

(2): Estimate of the Ministry of Environment and Forestry, India.

(3): Estimate of the Task Force Report, Government of India.

71. As can be seen from the above table, the cost of adjustment is higher for the producer in the case of an early phase out, because their investment outlays in CFC technologies would not be fully recovered. Costs will also have to be borne because the capacity for CFC production is greater than domestic demand. Not being able to export CFCs to article 5.1 countries will mean that the excess capacity will have to be shut down. Alternatively, in view of the capacity available for exports, it may be necessary to bring out adjustments early and identify indigenous substitutes. This, however, would also prove to be an expensive exercise, adding to the cost of adjustment. In addition, some of the units have not even finished paying for their investment yet. Shutting down or investing in new technology would increase the burden of adjustment, although Research and Development costs are lower in the short run. The additional cost to users and consumers of the final product will be small.

72. On the other hand, if a late phase out occurs, the consumer bears a greater burden, because while the producer of CFCs would have written off his investment, the users of this substance and consumers of the final products will be unable to recharge their CFC using refrigerators and other products after 2010.

73. All estimates conclude that late phase out is more expensive than an early phase out. This is mainly because in terms of numbers, consumers, who will bear the greater burden of the late phase out, outweigh definitely the number of producers of the controlled substance. In a tropical climate like India's, the need for air conditioners, refrigerators and water coolers is greater than a country with a temperate climate.

74. In addition, with developments in horticulture, aquaculture, and floriculture especially for exports, cold storage chains become increasingly important. The growth of this section of the economy is projected to be high in the coming years, increasing the demand for refrigeration.

75. While it is felt that the fund established by the Montreal Protocol will help pay for the cost of adjustments, the study on India shows that even the amount required by this one country is higher than what the Fund has approved in total for project development, which is US\$278 million²⁴. The costs estimated by the World Bank were US\$ 320 million and US\$ 482 million, respectively. The Indian Government has estimated that costs could be as high as US\$ 1.4 billion and US\$ 2.4 billion, respectively. This is at least four times the size of the entire multilateral fund. However, it should be noted that alternative technologies and substitute chemicals are likely to be less expensive over time. This may not have been reflected in the estimate provided by the task force.

76. At the firm level, it was found that the transition to intermediate substitutes was very expensive. Besides acquiring the substitute chemicals, firms also have to access technology which is suitable to the use of the substitutes. In addition, substitute chemicals do not operate with the same efficiency as CFCs. As a result, even where tie-ups had been possible, exporters felt that the cost of adjusting to HCFC was 30 to 35 per cent of the current price of refrigerators.

77. Firms were generally of the opinion that the basic system design necessary for switching to the intermediate technology is not available at present in India. Thus, firms had to rely on tie-ups with foreign companies. However, where no joint venture was possible, acquisition of technology was very difficult, because foreign companies were reportedly unwilling to share HCFC technology²⁵. In general, the only technology available to India is the CFC technology, which is not useful even in the medium term. Acquiring appropriate technology for long term use is out of the question because it has not been developed even internationally.

78. Another technological barrier is that CFC free new technology may sometimes not be suitable to the tropical conditions in India. On this subject, information and testing facilities are difficult to access. Emphasis must be laid on Research and Development for identifying indigenous substitutes, which are suitable to Indian conditions. The overall cost of compliance will depend also on the technology used by the firms. According to one study, developing indigenous technology would be the most cost effective option for India in the long run.

VI. EFFECTS OF TRADE ON ENVIRONMENT

79. Economic liberalisation has led to the expansion of export. However, production for exports still comprises only a small proportion of the overall production, which is mainly absorbed by the large domestic market, making it difficult to conclude that exportables contribute significantly to the environmental damage in the country.

80. One study did attempt to analyse the average CO₂ emission caused by production for exports, as compared to that of production for domestic consumption.²⁶ In doing so, the study took into account indirect or "embodied" exports, namely, those outputs which are purchased by other Indian industries and then used as inputs in the production of exportables. In this context, electricity turned out to be a very significant polluter.

81. Sectors under study were leather, chemicals, marine products, cotton textiles, tea and coffee, mining and electricity. For some products, such as leather and electricity, the proportion of production for exports was the same as the contribution of the export in the emission. In several other sectors, such as chemicals, mining and marine products, the contribution of the exports in the emission was lower than the percentage of output going towards exports. Tea and coffee, on the other hand, demonstrated a higher than proportionate

emission level. Therefore, sectorally, no exact correlation could be established between environmental damage and production for export.

82. When considering the greenhouse gas emissions of all the above sectors combined, the study found that exports accounted for 9.8 per cent of carbon dioxide emissions in the country while they constituted about 8.7 per cent of the total output in the country, demonstrating that exports were only slightly more carbon intensive than overall production in the country.

83. The discussion on the impact of export production on the environment also concluded that the ecological damage which is attributable to production for exports is, mostly local in nature, and can therefore be solved by appropriate environmental policies, rather than through trade measures.

VII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

84. The studies conclude that external eco-regulations and eco-labelling are beginning to affect Indian exports. Sectors which were deemed most vulnerable to external eco-regulations include textiles, leather, dyes and food products. As exports of marine products rise, the sector is likely to become more exposed to external regulations.

85. Complying with external standards may be difficult predominantly on account of the cost involved. Changes to accommodate eco-friendly inputs and technology were found to affect the price of the final product. In some cases, complying with eco-standards involved changing the production line for different markets, leading to an additional price rise. Because most Indian exports compete mainly on the basis of price, such a price rise is likely to hamper their competitiveness, if competitors do not also raise their prices in a similar fashion in response to compliance with the same external standards.

86. Compliance with voluntary labelling schemes too may be expensive. While obtaining eco-labels could lead to price premiums, the market for eco-friendly products was small; tough competition existed to capture this segment of the market. Hence, while the cost of compliance was high, commensurate returns were not always assured.

87. Compliance with eco-regulations and eco-stipulations was found to affect the SMEs more seriously than larger enterprises. Approximately 70 percent of leather exports from India, for instance, come from SMEs. SMEs may be unable to access information about external regulations. Given their scale of operations, access to eco-friendly inputs and technology is very difficult for them. Special measures to buttress this sector are thus required.

88. Besides external regulations, MEAs are also important for India. The Montreal Protocol is likely to affect India in particular, mainly because unlike most developing countries, India is a producer of CFCs. Adhering to this Protocol would therefore affect producers, user industries and consumers. Although a fund exists for catering to the adjustment needs of signatory countries, the estimates on the cost of adjustment for India showed that the available resources were not sufficient for phasing out CFCs. It was concluded that in the case of an early phase out, the major cost of the switchover would be borne by producers of CFC. A late phase out would affect users and consumers of final goods more significantly. Overall, the cost involved in an early phase out was found to be lower than the cost of a late phase out.

89. In addition to the cost of phase out, inadequate access to technology was found to be a major preoccupation in the context of the Montreal Protocol. Some exporters felt that foreign firms possessing the phase out technology were unwilling to share it. At the same time, this technology did not take into account the climatic conditions prevailing in India. Hence, exporters felt that Research and Development efforts were required to develop new technologies which, while adhering to the Montreal Protocol, would also be suited to Indian conditions.

90. On the question of the impact of export expansion on the environment, the relationship was not clear. This was mainly because exports comprise only a small portion of the GDP in India, making it difficult to isolate the impact of production for exports and production for the domestic market.

B. Recommendations

91. Like many developing countries, India often faces a dilemma. Urgent budgetary claims relating to education, health and infrastructure may have to be balanced with the cost of compliance with environmental policies of OECD countries that could affect their export, and may not be in accordance with the development process²⁷. It was pointed out that importers demanded and focused attention on the commodities they use, even though environmental problems in other areas (for instance water and sanitation facilities) may be more urgent, as indicated in section III. This may thus, affect development or environmental priorities of exporting developing countries such as India.

92. In order to cope with eco-regulations, a concerted policy structure is required so that compliance with these can take place without compromising domestic development priorities. For this, proactive measures would be required at the domestic and the international level.

1. Positive measures at the domestic level

93. The involvement of the corporate sector, particularly those industries and enterprises potentially affected by external regulations and MEAs, should be encouraged. Taking the example of the phasing out of CFC, it was found that while the government is still deliberating over what phase-out strategy to adopt, many Indian refrigeration and air conditioning manufacturers have already begun the process of adjustment.

94. However, some activities cannot be carried out by individual firms for lack of funds and technology. Information dissemination is a case in point. The government could facilitate this process by creating awareness on regulations, voluntary labels and available eco-friendly technology. Exporters' councils could also be directly involved in the process of information dissemination. These would serve as a link between the government and the exporter. In order to fulfill such a function, however, the councils need to be supported and strengthened so that they may be aware of the latest developments on markets, prices, technology, raw materials, new processes and new regulations on the environment. In addition, they will have to develop analytical skills in assessing changes and formulating strategies to adapt to continuously changing markets.

95. Export councils could also be delegated to collect information from exporters and participate in international trade negotiations, along with the government, so that the concerns of the exporters with regard to stringent and changing regulations are addressed more effectively.

96. Besides information and negotiation, other issues too require government intervention. Testing for compliance with environmental regulations is one such area. While it is clear that testing the quality and the degree of eco-friendliness of the product is desirable, the technology to do so has been inaccessible to firms in the domestic economy. In such a case, the government should facilitate foreign collaborations, particularly for investments in technology, both for the purpose of testing and for production.

97. In the case of the dyestuff industry too, special measures may be desirable. This is particularly true because a significant portion of the output comes from SMEs. A number of these firms have requested the government to assist them in establishing common effluent treatment (CET) plants, as the cost of establishing these facilities may be prohibitively high. Both the State and the Central governments have begun to fund CET plants.

98. This policy would, however only be viable if the units are located at a close physical proximity. If they are scattered across a region, another solution would have to be found. One option may be to encourage,

through subsidies and other incentives, the usage of organic and other environmentally friendly chemicals, so that the pollution level can be contained.

99. If eco friendly techniques are used in the process of production, these must be marketed appropriately in order to attract attention on the international market. To this end, a joint effort between exporters, export promotion councils and the government would be useful.

100. The government should take a pro-active stand particularly in areas where the domestic ecological concerns and those of major export markets coincide. The government has already intervened in the case of benzidine content in dyes, and excessive pesticide usage in tea and other agro-products. A similar proactive stand is required in other areas, which are the subject of both local and external ecological concerns.

2. Positive measures at the international level

101. In order to prevent the formulation of standards with unnecessary adverse effects on trade, the importing country should study the impact of the regulation on both domestic producers and on exporters. Regulations should be developed in consultation with the exporting country, in this case, India, particularly if it is a significant supplier of the product.

102. It has also been argued in one study that the burden of justifying regulations on environment and health grounds, for instance, should rest on the importing country and that the arguments should be available for open debate ²⁸.

103. On the issue of changing regulations, exporters have noted, particularly in the area of leather exports, that there is often a lag between the law coming into effect, and effective information dissemination. The importing country must give a sufficiently early notice to exporters, so that they are in a position to learn about the new regulation and respond to the same effectively.

104. If the regulation in place creates technological barriers, technical assistance from developed countries may be necessary. The technology required for carrying out eco-friendly production, and the technique to test for eco-friendliness are so varied, that even with governmental support, the costs involved would be too high. Some co-ordination between OECD and developing countries would be helpful, as also providing financial assistance for testing facilities. Indo-German and Indo-Dutch collaborations in the leather sector are already underway, and similar efforts need to be made in other sectors too.

105. Where sales of technology are required, caution must be exercised, however. The technology so purchased should be attuned to the comparative advantage that Indian exporters enjoy based on their own processing methods, labour costs and environmental assimilative capacity.

106. In sectors where technological co-operation is not possible, or the technology for eco-friendly production has not been devised even in OECD countries, it would be essential to provide financial and technical assistance to research institutes which are equipped to carry out the relevant research. Some organisations, such as the Indian Institute of Packaging, are already involved in such activities. These should be identified and fortified; efforts should be made to encourage innovations in the area of eco-friendly technology which is suitable for India.

107. In order to comply with stringent external eco-regulations, co-operation must be forged with the importing countries, while negotiating the regulations. At a domestic level, rigorous information

dissemination, and eco-friendly production and packaging in keeping with its inherent advantage can help India gain in terms of a cleaner environment and an expanded export market in the long run.

Notes

1. Some items in which India might have an advantage are certain varieties of rice, cotton, tobacco, tea, coffee, banana and pepper. This information is based on information provided in: Nayyar, D., and A. Sen, 1994, "International Trade and the Agricultural Sector In India", in Economic and Political Weekly, Bombay.
2. Parikh, J, V.K Sharma, U. Ghosh and M. Panda, 1994, Trade and Environment Linkages: A Case Study of India, Indira Gandhi Institute of Development Research, Bombay.
3. Bharucha, V., 1994, Impact of Environmental Standards and Regulations on India's Exports, Study prepared for United Nations Conference on Trade and Development, Project RAS/92/034.
4. Other works used in this summary are chapters from Trade, Environment and Sustainable Development: A South Asian Perspective, UNCTAD. The works referred to in particular are: Jhamtani, R.C., Making Trade and Environment Policies Compatible. Jha, A., Protection of the Environment, Trade and India's Leather Exports. Achanta, A., et al, The Transfer of Environmentally Sound Technologies.
5. Bharucha, 1994, op.cit.
6. Ibid.
7. Ibid.
8. Dyes used in the production of leather and leather products also come under strict scrutiny in the OECD nations. The specifics are discussed in the section on dyes.
9. Bharucha, 1994, op.cit.
10. Ibid.
11. Parikh et al, 1994, op.cit.
12. Bharucha, 1994, op.cit.
13. This estimate is based on data provided by ESCAP, 1995 and Parikh et al, 1994.
14. Bharucha, 1994, op.cit.
15. Parikh et al, 1994, op.cit.
16. Ibid.
17. Bharucha, 1994, op.cit.
18. Ibid.
19. Ibid.
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22. ESCAP, 1995, Expansion of Manufactured Exports by Small and Medium Enterprises (SMEs) in ESCAP Region, Vol.II: National Studies, United Nations, New York.
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