

# RIS DISCUSSION PAPERS

**WTO and Product related Environmental  
Standards: Emerging Issues and  
Policy Options before India**

Sachin Chaturvedi  
and  
Gunjan Nagpal

RIS-DP # 36/2002



**Research and Information System  
for the Non-Aligned and  
Other Developing Countries**

# **WTO and Product related Environmental Standards: Emerging Issues and Policy Options before India**

**Sachin Chaturvedi  
Gunjan Nagpal**

August 2002

**RESEARCH AND INFORMATION SYSTEM FOR THE NON-ALIGNED AND  
OTHER DEVELOPING COUNTRIES (RIS)**

Zone IV-B, Fourth Floor, India Habitat Centre, Lodi Road, New Delhi-110 003 (India)

Tel: +91-11-4682177-80; Fax: 4682174

email: sachin@ris.org.in

# **WTO and Product related Environmental Standards: Emerging Issues and Policy Options before India\***

---

Sachin Chaturvedi  
Gunjan Nagpal

## **I Introduction**

The debate on the impact of trade liberalization has intensified with a growing literature on the effects of international trade on the environment. Many participants in the trade and environment debate, have feared that there could be conflicts between trade liberalization and environmental concerns. The issues of environmental regulation and international competitiveness revolve around the question of harmonization of standards and it is generally observed that competitive deregulation could lead to downward harmonization of environmental standards.<sup>1</sup> In the context of WTO, the nature of linkage between trade performance and environmental measures has become a major concern for the developing countries. An added dimension to this debate pertains to the national technical regulations and standards pertaining to environment. These environmental standards, often resorted to by developed countries, are seen as non- tariff barriers against Southern trade.

The distinction between environmental standards and health and quality standards is gradually becoming blurred (Jha 2001). Empirical evidence on this in the literature is extremely thin. As the liberalization of tariff and quantitative restrictions on trade in agricultural and food products has progressed, more attention is paid on technical measures such as food safety regulation, labeling requirement and quality standards. The Agreement on Sanitary and Phyto-Sanitary (SPS) measures seeks to protect consumers by providing rules for food safety and health of plants and animals. Given the nature and depth of the existing regulatory structures in case of SPS in the developed countries, the developing countries often find it difficult to comply with such standards. At times, it seems that, SPS measures may impede trade in agricultural and food products since in many instances they are incompatible with prevailing systems of production and marketing. Further, the developing countries often lack appropriate scientific and technical

---

\* Author would like to thank Dr. Nagesh Kumar and Mr. Saikat Sinha Roy for their comments on an earlier draft and Ms. Ritu for her Secretarial Assistance.

expertise to deal with such standards and as a result, some developing countries have experienced losses in exports. Moreover, the multiplicity of standards in the developed country markets has further compounded the problems being faced by developing country exporters.

It has been agreed at the recently held WTO Ministerial Conference at Doha that negotiations on issues relating to SPS measures will be addressed on a priority basis in the next ministerial conference. In this regard, the Committee on Trade and Environment (CTE) has been instructed to give particular attention to the effects of environmental measures on market access and trade. This issue assumes importance in light of the fact that the past decade has seen a global proliferation of environment and health related standards along with a rise in the trade in environmentally sensitive goods. Since the inception of WTO, some 2300 notifications have been received and almost 11 per cent of them are related to environment.<sup>2</sup>

This paper aims at examining these emerging issues in the Indian context. Section II maps out the trends in trade of environmentally sensitive goods in India in the South Asian context. Section III is an attempt to analyse the whole issue of translocation of dirty industries to India on the basis of available evidence. In the Section IV, we have tried to identify certain emerging challenges while the last section gives the concluding remarks and policy recommendations.

## **II Environment-related Non-Tariff Barriers (ETBs)**

Environmental and health related standards and regulations in the developed country markets have the potential to create barriers to trade. However, now it is clear that the ETBs generally cover all those barriers that have been introduced by the importing country to protect the environment as well as health and safety of wildlife, plants, animals and humans. The developing countries have had to adjust their production processes in response to changing environmental regulations in the developed countries<sup>3</sup>. Measures such as pesticide maximum residue levels (MRL) permitted in foodstuffs, emission standards for machines, and packaging requirements have exerted pressure on the exporters. However, what remains to be seen is the extent of impact of these technical measures on trade. It is now widely believed that these technical measures impede trade of developing countries, either implicitly or explicitly.

There are very few studies, which have quantified the impact of Environment related trade barriers on global trade in general and South Asia, in particular. The issue of compliance cost is equally concerning for the developing countries. For instance, the costs of upgrading sanitary conditions in the Bangladesh frozen shrimp industry to satisfy EU and US hygiene requirements is estimated to be \$ 17.6 million in 1997-98<sup>4</sup>. The total industry cost, that is required to maintain Hazard Analysis Critical Control Point (HACCP), is \$2.2 million per annum. The European standards are more stringent than HACCP methods. In the case of marine products, EU regulations concerning implementation of food safety systems, additive requirements and other process controls are of very high order. As a result, many of the Indian companies were required to upgrade their facilities, which amounts to a huge expenditure and a number of companies were also forced to close down their factories for a long duration to enable them to upgrade their facilities with heavy investments. Currently, only 90 out of 404 plants in India are approved for fishery exports to EU<sup>5</sup>.

Some of the recent empirical evidence suggest that the competitiveness of Indian exportables like tea, dyes, agriculture products and processed foods, marine products, leather, textiles, and the refrigeration and air- conditioning items are likely to be impaired by the introduction of stringent environmental standards in OECD member-country markets<sup>6</sup>. The main conclusion emanating from the study by Bharuchia (2000) is that compliance with external eco-standards often necessitated the import of inputs and technology, which were likely to raise the cost of production and price of output. Since competitiveness of many Indian exports is price based such a rise in costs, could hamper India's competitiveness. The competitiveness effects of increased environmental compliance costs largely depend on the share of corresponding cost categories in total production costs. Thus low valued products may be relatively vulnerable<sup>7</sup>. For example, packaging requirements may have more significant effects on certain fruits and vegetables than on high-value added products. The case of textile industry in India may also suffer from similar disadvantage.

#### *Nature and Composition of ETBs*

As the liberalization of tariff and quantitative restrictions on trade in agricultural and food products has progressed, such stringent technical standard as food safety regulation, labeling

requirements and quality and compositional standards to be applied globally have proliferated. While the developed countries vouch for meeting these standard, there has been an increasing concern of the developing countries about the impact of technical measures especially the environment-related standards on the exports of products from them. As mentioned earlier, major issue of concern is that, the distinguishing line between environmental, health and quality standards is gradually disappearing. For instance, in the food sector, what may be described as quality standard for food may also fall in the category of environmental standards.<sup>8</sup> Accordingly some of the recent studies have defined environment related trade barriers (ETBs) at a very broad level. ETBs have taken several forms in last few years. It covers considerations for protection of environment, wild life, plant health, human health and human safety.<sup>9</sup>

Limited primary data collection exercise in this regard, launched by Research and Information System for the Non-Aligned and Other Developing Countries (RIS) provide a glimpse of the various hurdles faced by exporters. Case in point is the experience of an Indian company, exporting seedless grapes, to a large chain of departmental stores in Europe. Prior to exporting, this company had to fill in an elaborate questionnaire, which covered issues like the status of their employees, working environment facilities, etc. available to them, and the working conditions. The exporters are supposed to meet certain social standards before they could start exporting what the importing company terms as, '*Socially Responsible Trading*'. This departmental chain has actually come out with a code for its exporters which covers apart from social issues, building health centres and getting new set of imported instruments for fire extinguishing and evacuation belts, etc. The RIS survey also shows that the production cost would go up by 35 to 40 per cent because of compliance with this code.<sup>10</sup> Apart from this, the grape exporters have to meet the various standards prescribed by *Eurepgap*- a document prescribing various standards, which would become mandatory by July 2003. The *Eurepgap* certification itself requires the exporters to meet a number of conditions, in case of training, planning and preparations, pesticide record keeping, disposal and post harvest preparation. Apart from this, the European countries levy import duty of additional 12.5 per cent on Indian grapes as against a number of supplies from African countries.

There is no doubt that in last few years, consumer movement across the world, especially in the developed countries, has become very strong. The consciousness for quality products has grown tremendously. This has compelled national governments to take adequate precautions in terms of product specifications for both the domestic producers as well as for the exporters to these economies. However, it is very important to distinguish between precautionary and protectionist ETBs. The methodology generally adopted to identify product specific ETBs is on the basis of frequency of its appearance in the list of notifications by member countries<sup>11</sup>, which implies that greater is the number of countries notifying a particular ETB for a same product, greater is the probability of this being a precautionary measure rather than a trade restrictive measure. It is assumed that when a single country or a limited number of countries enforce an ETB it is more likely that these countries have simply enforced a non-tariff barrier. When a large number of countries adopt this then the likelihood of this being real threat to environment is much greater. The TRAINS database from UNCTAD gives a detailed account of non-tariff trade barriers as all WTO members are supposed to notify non-tariff measures<sup>12</sup>. Fontagne (2001) has identified 43 out of 115 effective measures, enforced till 1999 from this database, which may be classified as ETBs.

At the global level, selected 185 products have been identified, which face environment related trade barriers at least in one importing country. World Imports in these products amount to US \$ 286 billion of which 49 per cent of the total value are affected by ETBs. The distribution by HS classification is very clear, with exception of chemicals and pharmaceuticals, only agro-products are the most affected ones<sup>13</sup>. In case of India, we have tried to work out India's exports of these 185 commodities. These are largely agricultural commodities and constitute almost 62 per cent of India's total agricultural exports. Out of this 26 per cent goes to United States, 7 per cent to European Union and 5 per cent to Japan.

It is clear from Annexure 1 that standards are important subjects of contention among WTO members. According to the WTO Secretariat, 193 disputes have been notified to the WTO. Of these, 32 have been settled, 34 Appellate Body and Panel Reports have been adopted, and 22 cases are active at this point of the time. The rest of the cases are in a consultative phase between affected parties. There have been 25 cases that refer to TBT or SPS provisions, which comes out

to be 13 per cent of the whole. In its first year of operation, the DSU saw one fourth - 11 out of 44 – of its cases refer to these two agreements. While the actors have largely been developed countries, the developing countries have also played a role. In fact, the first case resolved in the DSU was brought by a developing country – Venezuela, which won the case – and referenced TBT provisions.

The affected sectors due to external environmental requirements are found to be India's vibrant export oriented sectors such as leather and leather products, textiles, chemicals, marine products, tea and other agricultural products. The nature of NTBs faced by these sectors range from technical standards, product content requirements to mandatory labelling, eco-labelling, packaging requirements and other SPS related measures.

#### *Indian Exports*

Indian exports have registered a strong growth over the past decade. It has grown from \$ 18,477 million in 1990-91 to \$ 21,588 million in 2001-2002. The growth of exports over the decade was spread across all the major product categories. India's exports of agricultural and allied products have increased by about \$40 million from 1998 to 2001. However, the share of agriculture in total exports has fallen from about 18 per cent in 1998-99 to 14 per cent in 2000-01 (Table 1). Marine products form a bulk of the exports of agricultural products. More than 3 per cent of India's exports are marine products. In 1999-2001, marine products worth \$ 1183 million were exported. Manufactured goods on the other hand form more than 78 per cent of total exports of India in 2000-01. The export of textile fabrics and manufactures are about 31 per cent of total exports, more than 4 per cent of total exports comprises of leather manufactures and almost 11 per cent of it comprise of chemicals and allied products.



**Table 1: Sectoral Profile of Indian Exports (\$ Million)**

	1995-96		1999-2000		2000-2001	
	\$ million	% share	\$ million	% share	\$ million	% share
<b>1. Agricultural and allied products</b>	6320	19.88	5773	15.68	6246	14.02
1.1 Fish and fish preparations	1011	3.18	1183	3.21	1394	3.13
1.2 Coffee	449	1.41	331	0.90	259	0.58
1.3 Fruits, vegetables, etc.	240	0.75	288	0.78	352	0.79
1.4 Tea and mate	350	1.10	412	1.12	433	0.97
1.5 Mis. Processed Food (including juices, etc.)	223	0.70	154	0.42	240	0.54
<b>2. Manufactured goods</b>	23984	75.43	29431	79.93	35192	78.98
2.1 Textile fabrics & manufactures	7220	22.71	9272	25.18	10908	24.48
2.1.1 Cotton yarn, Fabrics, made-ups, etc	2577	8.10	3090	8.39	3509	7.87
2.1.2 Readymade garments of all textile materials	3676	11.56	4765	12.94	5577	12.52
2.3 Leather & leather manufactures	1731	5.44	1590	4.32	1951	4.38
<b>Total</b>	<b>31797</b>		<b>36822</b>		<b>44560</b>	

Source: Economic Survey (2002) Ministry of Finance, Government of India

#### *Agriculture and Marine Products*

The share of agricultural exports in total exports was 30 per cent in 1990-91, which has declined to 22 in 2001-2002. As a result, the recent attempts to widen the range of exports have led to the promotion of high-value added items such as processed agro and marine products, on our export basket. A number of agricultural exports from India are subject to SPS measures. Agricultural products are under strict surveillance especially in the EU where all imported food products are liable for inspection at the first point of entry for compliance with food laws pertaining to the

country of entry. The regulations in the EU also stipulate conditions regarding the labelling of packaging materials used in the imported products. In case of products like peanuts, other nuts and milk, EC has introduced a threshold level of the presence of aflatoxin in these products. Some of the quarantine restrictions on fresh fruits and vegetables imposed by many countries are not based on scientific justification. The level of protection proposed by EU is substantially higher than that provided under Codex recommendations. Aflatoxin problem is prevalent in chillies also. Spain recently detained chilli consignments from India. In the case of peanuts, the EU argument has been that the risk involved is of persons getting cancer in a population of one billion. This is extremely unreasonable because EU population is less than one third of a billion. So the level of SPS protection is not in relation to the extent of risk involved. Some importing countries not even acknowledge the statistics in terms of pest and disease prevalence in various parts of the world, submitted by international organizations. For instance, China imposed a ban on Indian grapes for Mediterranean fruit fly that does not exist in India.<sup>14</sup> Though specific measures have been taken in this regard to help out producers and exporters in terms of UNDP supported projects to produce aflatoxin free peanuts<sup>15</sup>. However, wider attempts are yet to be made to internalize the additional cost of compliance in the production structure. The compliance cost for Indian exporters at times is prohibitively high. At times, in certain cases like agro-commodities the investment on infrastructure alone ranges from Rs. 12 to 20 lakhs for high performance liquid chromatography.<sup>16</sup>

**Table 2 - Top ten Indian agricultural trade partners (2001)**

<b>Importing countries</b>	<b>Value of imports (US \$ million)</b>	<b>Share in total Indian agricultural exports. (%)</b>
European Union	1865.03	22.23
USA	1051.69	12.54
Japan	770.52	9.18
Bangladesh	468.03	5.58
UAE	458.83	5.47
UK	425.85	5.08
Saudi Arabia	391.9	4.67
Hong Kong	342.08	4.08
Russia	317.74	3.79
Italy	314.93	3.75

**Source:** India Trade version. 2.0

Japan is one of the important trading partner for India. As Table 2 shows India's major agricultural trading destinations are European Union (22 per cent) and USA (13 per cent) and Japan (9 per cent). In Japan, the food sanitation law prohibits the import of many citrus fruits from India without any justification.<sup>17</sup> Indian flower industry is facing a whole set of NTBs while exporting to Japan. In recent past, Japan has imposed zero tolerance clauses on insects, on the assumption that these could possibly be present in Indian flowers. This clause is imposed on particular insects, which are already present in abundance in Japan. There is another problem with regard to quarantine of flowers<sup>18</sup>. The plant quarantine authorities at Japanese airports take a lot of time in the clearance of flower consignments due to elaborate fumigation procedures because of which it takes 5-9 hours to clear a consignment of flowers, which are highly perishable. Many of the South Asian suppliers of flowers are allowed to do pre-shipment inspection at the port of dispatch. In that case it is possible for Japan to post their inspectors at exit points of flowers. However the cost of posting inspectors is prohibitively high and would render Indian flowers uncompetitive. Another problem that Indian flower exporter face is that Japanese auction houses bring the Indian roses towards the end of the auction process after entire domestic supply and also flowers from other supplier countries have been auctioned. Since flowers are perishable, this affects their value in the market.

Indian exporters are subject to multiplicity of product and other standards. Recently, Italy and Germany have detained Indian spice consignments on the ground of pesticide residue. These countries failed to convince Indian exporters on the changes they made on their existing regulations on microbial contaminations and contamination due to pesticide residue. This is a blatant denial of facilities offered under Article 7 of the SPS regulations and is causing not only difficulties for India in its regular exports but also leading to loss of opportunities elsewhere.<sup>19</sup> The efforts of European Spice Association (ESA) to lay down uniform standards and code of practices in collaboration with the spice trade associations of individual European countries are yet to find wider acceptance at EC levels. Until a common European regulation and code of practice is established, traders have to follow regulations of individual countries.

A broader indication of impact of SPS requirements on South Asian exports of agricultural and food products is provided by data on rejections of exports from this region. At present such data

are available only for United States. Table 3 shows that, over the period August 2000 to July 2001, there were significant rejections of imports from South Asia due to microbiological contamination and filth. More than 40 per cent of rejections of exports from India was due to this reason. FDA rejected about 36 per cent of Bangladesh's exports because of microbiological contamination. This shows the considerable problems that South Asian countries have in meeting basic food hygiene requirements. The table also shows that these countries also have a problem meeting the stringent labeling requirements of the United States. More than 15 per cent of total agricultural imports from India and Sri Lanka were rejected because of their failure to meet these requirements. Other than that inadequate food additives, presence of pesticide residual and heavy metals and low acid canned foods are commonly cited reasons for contravention. Out of 18 import detentions of Sri Lanka, 9 detentions are because of low acid content in the canned food. More sophisticated monitoring and testing facilities, and therefore more costly procedures, are required for meeting these regulations. On top of that, the cost of rejection at the border can be considerable, as it includes loss of product value, transport and other export costs and product re-export or destruction. These non-tariff barriers to trade thus undermine the benefits of free access to the OECD market. They also make environment-related regulations stringent and some time arbitrary in nature.

### *Marine products*

Marine products are considered to be the most environmentally sensitive products in the international market. In India, till late seventies, the export of marine products mainly consisted of dried items like dried fish, dried shrimp, shark fins and fish maws etc<sup>20</sup>. However, later there was a decline in the export of dried marine products, and subsequently the exports of processed items continued to make steady progress in marine trade. The markets for Indian marine foods were initially confined to Singapore, Sri Lanka and Myanmar to a great extent. When frozen and canned items increasingly figured in the exports basket, USA, France, Canada, Japan and Australia became the important markets for Indian marine products. During 1980's canned items slowly disappeared and frozen items became the prominent ones in India's seafood trade. USA was the principal buyer of Indian frozen shrimp followed by Japan and Western European countries. The demand from Japan included headless shell or shrimp, USA demanded peeled shrimp meat while the European countries preferred the IQF (individually quick frozen) shrimp

and cooked form. During 1998-99, Japan continued to be the single largest buyer of Indian marine products accounting for 22.21 per cent in volume and 49.61 per cent in value, whereas USA accounted for 11.38 per cent of volume and 13.34 per cent of the value of total marine products exported from India. Due to import liberalization, during the same period, South east Asian countries also emerged as another important market accounting for 56.57 per cent in volume and 24.25 per cent in value. As against this, the share of member countries in the European countries was only 17.91 per cent by volume and 14.80 per cent by value. Therefore, the export of marine products grew to be one of the important item of India's exports from a few million US\$ in 1961-62 to US\$ 1106.9 million in 1997-98 accounting for approximately 3.32 per cent of the total export from India. In 2001-2002 it has a share of 3.13 per cent in total agricultural exports.

Among the ETBs faced by seafood and shrimps from India pertain to the level of pesticides and antibiotics. Various antibiotics and chemicals like oxolinic acid and oxytetracyclines without any specified limit are totally banned. Consignments containing DDT, Aldrin and Heptachlor are bound to be rejected. The EU directive has also imposed process standards requiring hygiene during handling, processing and storage of marine products. US ban on Indian shrimp products was a unilateral restriction on environmental reasons. In 1996, US banned shrimps from entry unless harvested by aquaculture caught with turtle excluding devices, or by manual instead of mechanical means or in cold water. US lost the case at WTO when India and other affected countries challenged the ban. However, the ban since 1996 adversely affected Indian shrimp exports.

### *Textiles*

Textile exports from India account for 24 per cent of countries export earnings. As Table 1 shows share of readymade garments in the export basket has hovered around 12 per cent. In 1999-2000, it was 12.9 per cent. This came down to 12.5 per cent in 2000-01 and then 11 per cent in 2001-02. It is also the country's net foreign exchange earner as the import content in textile is very little as compared to the other major export products.

**Table 3: Number of Contravention cited for US Food and Drug Administration import detention, August 2000-July2001**

<b>Reasons for contravention</b>	<b>India</b>	<b>Pakistan</b>	<b>Sri Lanka</b>	<b>Bangladesh</b>	<b>Nepal</b>
Food Additives	159 (7.4)	12 (1.3)		1 (3.0)	
Pesticide Residues	41 (1.9)				
Heavy Metals	13 (0.6)	4 (0.4)			
Mould	9 (0.4)				
Microbiological contamination	329 (15.3)	49 (5.5)		12 (36.4)	
Decomposition	7 (0.3)				
Filth	568 (26.4)	12 (1.3)	2 (11.1)	12 (36.4)	
Low acid canned foods	87 (4.1)	25 (2.8)	9 (50.0)	3 (9.1)	
Labeling	338 (15.7)	50 (5.6)	3 (16.7)	1 (3.0)	
Others	597 (27.8)	744 (83.0)	4 (22.2)	4 (12.1)	1
<b>Total</b>	<b>2148</b>	<b>896</b>	<b>18</b>	<b>33</b>	<b>1</b>

**Source:** US Food and Drug Administration import detention report, 2001.  
**Note:** Parenthesis gives the per centage share

Food Additives implies the presence of unsafe food additives, unsafe colour or other substance, which feared to cause food adulteration; Pesticide residue: presence pesticide residue to the limits that is unsafe; Heavy metals: Presence of poisonous metals which is injurious to health; \*Mould: presence of mould in the article .; \*Microbiological contamination refers to presence of poisonous bacteria such as Salmonella and Shigella. \*Decomposition refers to decomposition of the article because of being prepared packed or held in insanitary conditions.

\*Filth implies that the article appears to consist in whole or in part of filthy, putrid, or decomposed substance.  
\*A low acid canned food implies that food may be injurious to health due to inadequate acidification.  
\*Labeling implies violation of labeling requirements because of its placement, form, and/or content statement.

Around 40 per cent of India's textiles are directed to the European Union, but stringent environmental rules in the developed countries pose adverse consequences in India's export performance of late German textile industry in 1993 introduced two eco-labels viz. *Markenzeichen Schastoffgeprufth Textilien* (MST), which gave norms for consumer goods and indicated a lower content of pollutants, and *Markenzeichen Unweltschonende Textilien* (MUT), a label which sets norms for production processes. It indicated that all processing conditions were analysed with reference to the degree of pollution of air, water and soil. Apart from this, other national and private labels were also developed in Europe. For example, the Ostereichisches Textil-Forschungsinstitut has developed the *Oekotex* label, which relates to both raw material

and final product. The European Largest Textile and Apparel Companies (ELTAC) has also undertaken an eco-label initiative. In the textile and clothing sector, Germany has recently introduced the *Eco-Tex* Standard – 100 which lists various criteria for evaluating textiles from an ecological perspectives. Eco-tex standard 100 has been developed by International Association for Research in Eco-Textiles that offers manufacturers for garments and textiles the opportunity for certification of eco-friendly products.

The use of certain dyestuffs such as Cobalt Blue and Sulphur Black have been totally banned in the international market. Though viable substitutes have been explored, but switching over to them again requires higher investment of over US\$ 13 million mainly for the upgradation of the technology and new treatment plants in order to obtain the requisite quality. Likewise opting for non-benzidine dyes viz. Direct Black 38 dye and Direct Black 22 was priced at between \$8-10 per kg. Though SMEs contribution to the export basket of India are not available, but one study does estimate that over 60 per cent of production is by small scale enterprises. One can therefore extrapolate that an important part of exports comes from small scale units.

### *Leather Industry*

India, being the largest holding of livestock in the world, plays the role of a major player in the global leather trade. Leather industry is spread over organized as well as unorganized sector. The small scale enterprises (SMEs) account for over 75 per cent of total production. This industry has been identified as one of the thrust areas of exports. Export from leather sector which year account for about 4.3 per cent of India's exports. The export performance of the leather sector has improved considerably during the past decade. The value of exports went up from Rs. 3,036 crore during 1991-92 to Rs. 6,436 crore in 1998-99. Traditionally, the Indian leather industry has been an exporter of tanned hides and skins. Currently, leather footwear, footwear uppers, leather goods, garments and other leather goods are among the fastest growing export items from India. Germany is the largest single export market for Indian leather exports. The other important markets are France, United Kingdom and Italy. The Indian leather employs about 1.4 million people. There are about 2000 tanneries, in different states viz. Tamil Nadu, West Bengal, Maharashtra, UP, Karnataka and Rajasthan. Out of the total tanneries, 75 per cent of them fall within the SMEs.

On environmental standards, leather industry faces problems from both domestic and external front. The restrictions on the use of certain chemical dyestuffs and several other mandatory regulations in major export markets pose serious problems to the Indian leather sector. Germany along with the other European countries have already restricted the *benzidine* containing dyes and openly demands benzidine free leather imports. Germany has banned all the imported leather products containing *Pentachlorophenol* (PCP)-with the aim to protect its consumer from the possible incidence of cancer and also restricts the use of *formaldehyde*.<sup>21</sup> Only products treated with environment friendly chemicals are accepted in Germany and other developed country markets. EC standards for PCP is high around 1000 ppm or 10mg/kg. The stringent environmental standards imposed by EC has been criticized not only by the developing countries but also certain EU member countries themselves such as Italy and France. It is also to be noted that Italy has a big leather industry where as France is itself a major producer of PCP. Therefore, it is reasonable to believe that the purpose of protest from these two countries on PCP ban is to protect their domestic industries. The increasingly stringent export standards have contributed to a rise in the cost of production in the leather sector, where costs using the more environmentally friendly methods are nearly three times higher.<sup>22</sup> Most of the studies on competitiveness and environmental standards are based on environmental capital costs.

However, India, in its efforts to increase its leather exports, banned the production of PCP and accordingly its use in the processing of leather. According to some recent estimates the price of the substitute is around ten times higher than the existing price of PCP. For the easy availability of the substitutes, Government of India reduced the import duty from 150 to 50 per cent on these chemicals. Further, Central Leather Research Institute (CLRI) has also indigenously developed technology to enable local production of a substitute to PCP. Large number of alternatives of PCP exist such as “Busan 30”, which is acceptable in the international market. Though in India, PCP was manufactured locally at a cheaper price, “Busan 30” need to be imported either from Germany or US.



### **III Emerging Policy Challenges**

In the last decade or so environmental concerns have proliferated encompassing a large quantum of trade. This emanates from different international commitments such as Cartagena Biosafety Protocol and Kyoto Protocol. Apart from these protocols there are some emerging issues which are posing severe policy challenges to the governments in the developing countries, for instance, the growing electronic trade and the subsequent waste being generated out of it or trade in GMOs. However, along with these challenges are the emerging opportunities in terms of growing market size of Environment Friendly Products (EFPs). As many of the South Asian economies, especially India, are engaged in 'organic production' of agricultural commodities, it is better placed to tap these opportunities.

In the wide ranging commentaries on these protocols one finds a huge list of possible areas of conflicts in these and the provisions made in various agreements in WTO especially under TBT and SPS<sup>23</sup>. These environmental concerns are affecting trade prospects of developing countries. Some of the affected industries have suggested that the Kyoto Protocol's empowerment should be consistent with the existing WTO disciplines<sup>24</sup>. They have also suggested to avoid discrimination based on methods of processing and production (PPMs) which was at the basis of Kyoto deliberations on behalf of developing countries.

#### *Growing E-trade:*

The electronic industry was traditionally thought to be a relatively clean industry. But this image has taken a dent with greater realisation of ecological hazards emanating from this sector. The ecological hazards come not only from the processes of electronic commodity production but there are also some increasing worries about the disposal of electronic waste. In this regard, the EU Directives are expected to come into force in 2008 and this will have serious implications on the production processes of component exporters to the European Union. The implications of these emerging environmental regulations for firms in the developing countries that export to European markets are potentially very deep. These industries may have to redesign their manufacturing processes. A recent study shows that so far there is very little awareness amongst the Indian electronic component manufacturers about the EU directives and its implications.<sup>25</sup> A lack of environmentally sound technologies could be disastrous for this sector. It would become

impossible to sustain production and hence trade if eco-friendly practices are not imbibed. A lack of information about the various requirements and standards in importing countries could pose very serious hurdle to trade.

The electronic industry is one of the fastest growing industries today. It has emerged as one of the major sectors in India's export basket in recent years. The electronic industry has achieved a cumulative annual growth of 20 per cent in production and over 40 per cent in exports till 1998. The exports from this industry have been growing slowly over the past few years. Total electronic hardware exports, which were Rs. 11,080 million in 1993-94, went upto Rs. 18,000 million in 1998-1999 and then took a dip to Rs. 14, 000 million in 1999-2000. The Indian electronic sector comprises of a few large companies, some small and medium size enterprises (SMEs) and a large number of tiny and household enterprises.

#### *Labeling and Genetically Modified Goods:*

In recent past, biotechnology has posed some serious policy dilemmas before developing countries. European Union, Japan, Australia and several other countries have launched the plans for mandatory labelling of Genetically Modified (GM) foods. EU members have recently voted to require labels for food containing more than 1 per cent of GM material. The Canada and US have complained to the WTO regarding European measures to label GM products as that may violate WTO rules. Concern has been expressed by the US that vigilance is needed to ensure the EU plan is not used to bar US imports. In Australia, the deferment of a government decision regarding the labelling of GMO's is indicative of the uncertainty regarding conflict between eco-labelling and WTO jurisdiction. It is worth recalling here that the Cartagena Protocol on Biosafety was negotiated under the auspices of Convention on Biological Diversity (CBD) in 1992 and was adopted by a large number of countries (64) in 2000. This protocol provides rules for safe transfer, handling, use and disposal of living modified organisms (LMOs). The wide objective of the protocol is to address the threats posed by LMOs to biological diversity along with to human health.

There are three major areas of concerns which are generally found to be conflicting with the spirit and provisions in the SPS /TBT agreement under WTO. In terms of its spirit SPS

agreement seems to be more restrictive in nature while the Biosafety Protocol empowers for even taking grand measures for protection. Though the SPS agreement covers a wide spectrum of issues concerning human health which may affect access for trade of GMOs while the Biosafety Protocol apart from being GMO specific talks of biodiversity and health in general. The whole understanding of precautionary principle under article 5.7 of SPS and article 11.8 of Biosafety Protocol is contradictory in nature. Another area of concern is the acceptable level of risk which may be allowed while trading GMOs. On the areas of risk assessment and management, SPS broadly sets the tone for acceptable level of risk at the international level being endorsed by any international institution, while Biosafety Protocol refers to an exclusivist approach which may be adopted at national level. It is fairly possible that a conflict between SPS agreement and biosafety protocol may come up in not such a distant future. Though they have emerged in two different settings but addresses similar issues in contradictory terms. SPS is to address health issues in a wider context while biosafety protocol addresses health in a narrow context of trade in GMOs. The SPS imposes a restrictive regime emanating from international product standard setting institutions while biosafety protocol allows member countries to evolve their own necessary measures to protect their health and environment. Therefore the protocol has not laid any provisions for addressing disputes while, SPS, being mandatory in spirit, has a backing from a strong Dispute Settlement Provision (DSP).

Even though trade in biotechnology products has grown manifold in last decade the lack of adequate classification of such products results in negligible evidence of such trade from the South Asian region. The current estimated biotechnology market size for India is \$1475 million.<sup>26</sup> The product range from biotechnology related instruments, drugs and even agricultural and food products containing transgenic traces, commercial field trials of which, has not been permitted in many South Asian countries.<sup>27</sup>

However, in case of US a conscious effort has been made to develop a concept of collecting trade data on Advance Technology Products (ATP) by the US Census Bureau. All of the biotechnology products on the ATP list appear to belong to biologics. This is largely of therapeutic products derived from living organisms these include vaccines, human blood, plasma, proteins and monoclonal antibodies. This definition does not match with the definitions

evolved by other countries. The OECD in a separate exercise is attempting to evolve biotechnology statistics at least at the level of OECD countries<sup>28</sup>. The growing resistance within Europe of GM crops has already affected US agricultural exports. Soyabean exports to the EU, where 35% of US output is composed of genetically modified varieties declined from 9 million tons in 1997 to 6 million tons in 1998. Similarly, exports of corn (maize) in 1997 from US to EU was 1.6 million tons which has now declined to 0.3 million tons<sup>29</sup>. The global market for transgenic crops and related products has grown very fast in the last quinquennium. The sales have increased from \$ 75 million in 1995 to \$ 3 billion in 2000. This is likely to reach \$ 25 billion by 2010.<sup>30</sup>

### *Ecolabelling Measures*

Along with statutory eco-standards, criteria are also being set in importing countries through eco-labelling. In EU, several labelling systems already exist which apply to the final output as well as the process and production method itself. An eco-labelling scheme informs consumers that a labeled product is environmentally superior than other products in the same category. It is a form of third-party certification, with the certification done by a purely private organization such as Green Seal in the United States, or by a mixed public entity, as in the Canadian System. Eco-labelling schemes help consumers make decisions about the products they buy and whether they are environmentally friendly. There are several existing eco-label schemes around the world including the German Green Spot, the Nordic Swan and the US Green Seal.

Most current eco-label programs are ‘cradle to grave’, that is, they involve some form of analysis based on the environmental consequences of their manufacture, use and disposal. Eco-labelling schemes already in place, may conflict with the WTO Agreement on Technical Barriers to Trade. WTO rules decree that countries should not discriminate between products based on the environmental consequences of the way something is produced. The ecolabelling issue blends into two other market access obstacles viz. environmentally motivated government procurement and ISO 14000 series.

Discriminatory government procurement is a long-standing non-tariff trade barrier (NTB) regulated to some extent by the WTOs Government Procurement code. In recent years, some

governments have added environmental criteria to their procurement policies. The question arises is whether such criteria constitute a new set of NTBs. While green- consumerism in public procurement is not inherently against the interests of exporting countries, the potential for covert trade discrimination and the likelihood of increased costs for exporters are real, especially for smaller suppliers in developing countries. The 14000 series of ISO can also potentially act as an NTB. In 1993, the ISO extended its work to environmental management systems (EMS) in its 14000 series. The ISO 14000 initiative mirrors the broader trade issues of technical regulations, technical standards, and ecolabelling schemes. Though its purpose might be improvement of environmental performance and facilitation of international trade. But unless carefully crafted, the ISO 14000 series can act as a trade barrier. Specifically, if the EMS is prescriptive, detailed and costly to comply with, and if compliance requires strict criteria for subcontractor and suppliers' performance, it will be difficult for firms in developing countries to qualify. If ISO registration becomes a condition for at least some types of international business, the trade barrier potential may be realized.

In order to address the potential trade concerns, activities are taking place in various fora such as, the WTO, OECD, ISO and the Global Ecolabelling Network (GEN). The WTO is determining in what ways does ecolabelling fall within the scope of the WTO's Agreement on Technical Barriers of Trade. GEN is pursuing cooperation, as well as the possible harmonization and mutual recognition among programs. Mutual recognition could involve trading partners accepting each other's established ecolabelling criteria, consequently lowering or eliminating the probability that the criteria would act as barriers to trade among nations. Other types of mutual recognition include reciprocal acceptance of credibility or the acceptance by one program of another's test procedures and facilities.

Just as technical standards may create non-tariff trade barriers, ecolabelling schemes may inadvertently or deliberately create impediments to trade. Product categories eligible for labels may be selected to favor domestic over foreign producer's interest. The criteria for granting labels may also favor domestic over foreign producers. One example of this is the German textile-labelling scheme. The Blue Angel, which virtually prefers products, which use artificial dyes produced in Germany to natural dyes. Discrimination may exist in product classification

system as well. Austria imposed a mandatory labelling requirement for tropical timber and products but did not impose similar requirements for temperate forest products. This was later withdrawn after objections from the ASEAN countries. Another way that these eco-labelling requirements may act as a non-tariff trade barrier is the cost of compliance. As with technical regulations, the cost of compliance may be much higher for small export suppliers. They may have to incur cost such as information costs, plant inspection and certification cost and acquisition of approved inputs. In general, the criteria for granting ecolabels under life cycle assessment may be based on environmental conditions in the importing country and may be inappropriate in the country of production and export.

### **Indian Eco-Mark**

In India, the Government launched the eco-labelling scheme known as “Eco-Mark” in 1991. “Any product which is made, used or disposed of in a way that significantly reduces the harm it would otherwise cause the environment could be considered as Environment – Friendly Product.” The criteria of Indian Eco-mark are based on cradle- to grave approach, i.e. from raw material extraction to manufacturing and to disposal. There are three stages involved in the Eco-mark scheme. The first stage is to determine product categories for the scheme, which is done by a steering committee, set up in the Ministry of Environment and Forests. The committee also formulates strategies for promotion, implementation, future development and improvements in the working of the scheme. The second stage involves the identification of a specific product and recommendation of individual criteria to be adopted. A technical committee set up in the CPCB carries this out. Finally the Bureau of Indian Standards (BIS) assesses and certifies the products and draw up a contract with the manufactures.

The Indian Eco-Mark has not achieved the desired results so far. The response from Indian companies for the award of Eco-Mark was very poor. In 1998, M/S Madhya Bharat Paper Mills Limited successfully completed the formalities and received Indian Eco-mark license for producing writing and printing paper. While Eco-labelling in other countries are gaining popularity, the initiatives taken by the Government of India still waiting for a break through. The Government has initiated several steps to tackle the above problems. For instance, a scheme encouraging industries to produce environment –friendly products is in the pipe line. Similarly, in the case of leather products, the pre condition for ISI mark for obtaining Eco-mark is not

required for those who are producing a certificate from the buyers in the foreign market. With these initiatives, the number of companies approaching for Eco-Mark is likely to be increased. The problem of obtaining multiple Eco-labelling will be solved through agreement of mutual recognition of Eco-labelling schemes across countries.

However, during the primary data collection exercise at RIS, there were frequent references to the option of the eco-labelling programme of the importing country awarding its own eco-label to products meeting the process-related criteria of the exporting country and the use and disposal criteria of the importing country. In this regard, the life-cycle analysis for eco-labelling could be split into 'cradle to export border' and 'import border to grave'. While mutual recognition could benefit countries, which already have national eco-labelling programmes, in other cases the concept of "equivalencies" was seen as more useful. Establishing such equivalence would take account of comparable environmental objectives, different ways of achieving them and differences in environmental and developmental conditions across countries.

#### **IV Policy Recommendations and Concluding Remarks**

In recent past, several issues related to environment have emerged which have serious bearings on multilateral trading agreements. It is important to clear the relationship between eco-labelling and Technical Barriers to Trade (TBT) agreement. In this regard, exploration of the possibility of government participation in such schemes may be a relevant exercise. This may help in ensuring greater transparency in the working. It is important that for transparency automatic notification to all parties should be sent and, in fact, for trade purposes, the *ex-ante* transparency is especially important. The implications of the TBT agreement extended beyond transparency question may include important substantive elements such as, equivalency, mutual recognition, dispute settlement and technical assistance. However, though India has launched an eco-labelling programme but certainly increased assistance in this area is needed, with focus on technical assistance to help develop and improve certification procedures.

India would also have to upgrade the national system for testing, certification and laboratory accreditation so as to be at par with the global trade demands. In this regard, it is important to focus on capacity building in the private sector. Another related aspect is to closely study the

emerging pattern of Mutual Recognition Agreements (MRAs) already underway between couple of OECD countries. The MRAs would start the process of removing duplicative testing and certification requirements in a number of product sectors.

As is clear from various studies, the exports are facing a number of institutional constraints in meeting the international standards. Apart from this, the lack of timely and precise information about these standards is also a great obstacle for exports. In this regard, small and medium enterprises face innumerable problems. While large firms obtain timely and accurate information directly from the importers in developed country markets and various other sources, SMEs tend to depend on secondary sources, basically government sources, often implying considerable time delays. Creating awareness of regulations and voluntary labels and available eco-friendly technology would require government intervention.

The certification of environmentally friendly products may be costly and confusing, in particular when producers in developing countries depend on the testing and certification bodies in the developed countries. The creation of standardization bodies or the expansion of existing bodies in developing countries and steps contributing to their international recognition are of key importance. Improvements in environmental infrastructure play an important role in reducing the costs of compliance. In India, many government, trade, regulatory and research entities have some responsibility for addressing such measures, but there is no one entity directing and coordinating overall government effort. Some entities' roles and responsibilities regarding these measures are not clearly defined, and these entities have had difficulty coordinating their activities. As far as testing facilities are concerned, our laboratories are poorly equipped in machines and in skilled manpower, which has led to poor reputation of our test results in international markets. Thus exporters resort to multinational testing facilities which are more expensive. Accreditation of laboratories is voluntary and without any accountability. This has led to a mushrooming up of laboratories that are inappropriately equipped and often resort to issuing fake certificates.

There is limited support from the government of India available to the exporter to meet the increasing requirements. For instance, APEDA provides some assistance to the food exporters.



They are given assistance for purchase of specialized transport machinery, setting up of pre-cooling facilities with proper air handling system, provision of facilities for pre-shipment treatment such as fumigation, X-ray screening, hot water dip treatment, setting up of vapour heat treatment, electronic beam processing, assistance for setting up of environment control system and setting up of specialized storage facilities such as high humidity cold storage. These limited assistance schemes are subject to a number of restraints and some of these schemes are also being put to an end. Therefore, a more dynamic and vibrant strategy is required to face ETBs and help out the industry on this front.

As is clear, producers of organic products face several sets of potential constraints related to conversion, production, marketing and government support policies. Constraints on conversion to certified organic agriculture in developing countries include uncertainty about markets and price premiums. Certification costs, technical requirements and sanitary and phytosanitary (SPS) measures might act as obstacles to exports of organic food products from developing countries. Furthermore, organic vegetable and fruit markets tend to rely largely on locally produced food. In this regard governments should support the development of the agriculture sector, in particular the production of high-value products, improvement of quality and better participation in global value chains, by taking fiscal and other measures to attract investment and technologies into new areas. Options may also be explored for providing WTO acceptable support to the agriculture sector, in particular for research and development and quality assurance especially for reducing costs of certification of organic producers in developing countries by setting up local certification systems, promoting small holder certification, and reducing the costs of international accreditation for certifiers in developing Countries. In this context there is extreme urgency to develop international mechanisms to develop information channels to provide market information and analysis about these products and strengthen capacity-building initiatives.

The emerging trade and environment debate is highly complicated and interdisciplinary in nature. In India this becomes much more complicated as the number of agencies dealing with different commodities is very large. Moreover the agencies supposed to be doing the coordination often loose track of affected trade as at micro level the magnitude is too small to be taken into account. And there is no mechanism in place to pool data at one place so as to facilitate putting pieces take together and develop a macro-vision out of it. Therefore, there is an

immediate need to develop a database in India, profiling trade and environment related cases. Once a sizable set of data is available, attempts may be made to quantify the trade distortion effects of those environment measures, if at all they are there.

## References

Basu, M. S and Radhakrishanan (2001). Capacity Building in Peanut farms: A success Story. Paper presented at the UNCTAD/World Bank workshop.

Bhagwati. J and Hudec. R (1996). Fair Trade and Harmonization-Prerequisites for Free Trade? The MIT Press.

Bharucha, V. (1994). Impact of Environmental Standards and Regulations Set in Foreign Markets on Indian Exports in Jha, V. et.al. (Ed. 1994), *Trade, Environment and Sustainable Development: A South Asian Perspective*, United Nations: New York.

Bharucha, V. (2000). The Impact of Environmental Standards and regulations set in Foreign Markets on India's Exports in Veena Jha, G. Hewison and M. Undenhills (eds.) *Trade, Environment and Sustainable Development: A South Asia Perspective*, London: Macmillan Press, pp. 123-42.

Cato, J.C. (1998). Economic issues Associated with seafood safety and implementation of seafood HACCP programmes. Rome: FAO

Chaturvedi, S. and Nagpal, Gunjan (2001). Product Standards and trade in environmentally sensitive goods: A Study of South Asian Experience. RIS Discussion Paper No. 22.

Chaturvedi, S. (2002). WTO, Biosafety Regulatory Regime and Trade in Genetically Modified Goods: Options before Developing Countries-An Indian Perspective. Paper presented in International Conference on Biotechnology and Development: Challenges and Opportunities for Asian Region.

Ferrantino, M.J. and Linda A. Lindins (1999). The Effect of Global Trade Liberalization on Toxic Emissions in Industry. *Weltwirtschaftliches Archiv*, Band 135 (1), pp. 128-55.

Fontagne, Lionel, Friedrich von Kirchbach and Mondher Mimouni (2001). A First Assessment of Environment-Related Trade Barriers. *Mimeo*, October.

Jha Veena (2001) Strengthening Developing Countries' Capacities to Respond to Health, Sanitary and Environment Requirements: A Scoping paper for South Asia, New Delhi, UNCTAD.

Kittu,C., "Issues on SPS and Environmental Standards for India" paper presented at the UNCTAD/World Bank Conference on 11-13 January 2001

Letchumanan, R. (1998). Trade, environment and competitiveness: Testing the 'pollution haven' hypothesis from technology perceptive. *UNU Working Paper* No. 43.

Low, P. and Yeates, A. (1992). Do 'Dirty' Industries Migrate? International Trade and the Environment, *World Bank discussion paper*, No. 159, pp-89-104.

Manoharan, T. R., Pandey, B. and Khan, Z. D. (2000). Trade and Environment Linkages: A Review of Conceptual and Policy Issues. RIS Discussion Paper No. 03.

OECD (1997). Globalisation and Environment: Preliminary Perspectives. Paris.

OECD (2001). Biotechnology Statistics in OECD Member Countries: Compendium of Existing National Statistics. STI working paper no. 6.

Parikh, J. K., V. K. Sharma, U. Ghosh and M. K. Panda (1994). Trade and Environment Linkages: A Case Study of India report prepared for *United Nations Conference on Trade and Development*, August.

Pearson, Charles (ed.) (2000). Multinational corporations, environment, and the third world. Durham, NC: Duke University Press.

Perdikis, N., William A. Kerr and Jill E. Hobbs (2001). Reforming the WTO to Defuse Potential Trade Conflicts in Genetically Modified Good. *The WTO and Genetically Modified Goods*.

Saqib, M. (2000). Technical barriers to trade and the role of Indian standard institutions. *RIGCS Working paper series no.* 19.

World Bank (1998). World Development Report 1998-99, New York. Oxford University Press.

Xu. Xinpeng (1999). Do Stringent Environmental regulation reduce the International competitiveness of Environmentally Sensitive Goods? A Global perspective. *World Development*, Vol. 27, no. 7, pp. 1215-1226.

**Annexure 1 : Disputes referencing SPS and TBT Agreements in WTO (upto December 1999)**

	Petitioner	Respondent	Product	Issue	Outcome
DS2	Venezuela	United States	Petrochemicals	Environment	Appellate Rept
DS3	United States	Korea	Agriculture	Food Safety	Consultations
DS4	Brazil	United States	Petrochemicals	Environmental	Appellate Rept
DS5	United States	Korea	Agriculture	Food Safety	Settlement
DS12	Peru	EC	Agriculture	Marketing	Settlement
DS14	Chile	EC	Agriculture	Marketing	Settlement
DS18	Canada	Australia	Agriculture	Quantitative	Appellate Rept
DS20	Canada	Korea	Agriculture	Food Safety	Settlement
DS21	United States	Australia	Agriculture	Quantitative	Active
DS26	United States	EC	Agriculture	Food Safety	Arbitration
DS41	United States	Korea	Agriculture	Food Safety	Consultations
DS48	Canada	EC	Agriculture	Food Safety	Arbitration
DS56	United States	Argentina	Textiles	Customs	Appellate Rept.
DS61	Philippines	United States	Agriculture	Environmental	Consultations
DS72	New Zealand	EC	Agriculture	Customs	Settlement
DS76	United States	Japan	Agriculture	Food Safety	Appellate Rept
DS85	EC	United States	Textiles	Transit	Settlement
DS96	EC	India	Mixed	Customs	Settlement
DS100	EC	United States	Agriculture	Food Safety	Consultations
DS133	Switzerland	Slovak Republic	Agriculture	Transit	Consultations
DS134	India	EC	Agriculture	Customs	Consultations
DS135	EC	United States	Textiles	Customs	Active
DS137	Canada	EC	Agriculture	Quantitative	Consultations
DS144	Canada	United States	Agriculture	Transit	Consultations
DS151	EC	United States	Textiles	Customs	Consultations

## Endnotes

---

- <sup>1</sup> Nordstrom *et. al* (1999), Bhagwati (1996) and Pearson (2000)
- <sup>2</sup> Nordstrom and Vaughan (1999)
- <sup>3</sup> Jha *et.al* (2000)
- <sup>4</sup> Cato (1998)
- <sup>5</sup> *ibid.*
- <sup>6</sup> Bharucha (2000)
- <sup>7</sup> Jha and Vossenaar (2000)
- <sup>8</sup> Jha (2001)
- <sup>9</sup> Fontagne (2001).
- <sup>10</sup> Based on Primary Survey of Industries conducted by RIS (2001-02).
- <sup>11</sup> *Ibid.*
- <sup>12</sup> Though many countries do not notify all the NTBs, so this database has to be approached with caution.
- <sup>13</sup> ITC (2001)
- <sup>14</sup> Personal Communication with S. Dave, APEDA.
- <sup>15</sup> Basu, M. S and Radhakrishanan, Capacity Building in Peanut farms: A success Story: paper presented at the UNCTAD/World Bank workshop on 11-13 January, 2001.
- <sup>16</sup> Kittu.,C., “Issues on SPS and Environmental Standards for India” paper presented at the UNCTAD/World Bank Conference on 11-13 January 2001
- <sup>17</sup> Based on Primary Survey of Industries conducted by RIS.
- <sup>18</sup> APEDA 2001.
- <sup>19</sup> Kittu.C (2001).
- <sup>20</sup> This is based on series of discussion papers brought out by RIS under this project.
- <sup>21</sup> PCP has been in use as a preservative for raw hides and skins.
- <sup>22</sup> Parikh *et.al.* (1994).
- <sup>23</sup> For details see Zarrilli, 2000, Nielson *et. al.*, 2000.
- <sup>24</sup> Please see the Policy Statement from International Chamber of Commerce, October 26, 1999.
- <sup>25</sup> Saquib (2000)
- <sup>26</sup> Economist 1<sup>st</sup> September (2001)
- <sup>27</sup> In fact Sri Lanka had to withdraw an official order banning imports of all food items containing GMOs. See RIS Biotechnology and Development Review Vol. 4 No. 1 for more details.
- <sup>28</sup> OECD, 2001.
- <sup>29</sup> Perdikis *et. al.*, 2001
- <sup>30</sup> Zarrilli (2000)