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# Environmental Provisions in the WTO and Asian Developing Country Perspective

by

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# Environmental Provisions in the WTO and Asian Developing Country Perspective*

**Aparna Sawhney**

*Abstract:*

This paper analyses the impact of the SPS and TBT agreements on developing Asian countries with special reference to India. The implementation of these provisions has raised questions of economic protection versus environmental protection. Departure from harmonized international standards, and proliferation of eco-branding in the North, has resulted in market fragmentation for developing country exports. While consumer sovereignty/environmental risk preferences of different nations have to be respected, developing countries need to express their own environmental priorities. Only then would global diversity in environmental endowment and knowledge be accurately reflected in the multilateral trading system and help achieve sustainable development.

## 1. Introduction

Today Asian developing countries have increasingly become dependent on trade and have increased their participation in the multilateral trading system under the WTO.[1] Trading rules have also changed fundamentally to accommodate differential environmental standards, certifications, and consumer risk preferences across nations, while promoting free trade. Trade restrictions based on domestic environmental stipulations, non-product related process and production methods (PPMs), and risk perceptions (precautionary principle) have now been legitimized.

In principle, different countries could well have the same environmental quality with different pollution standards or controls, because the resultant environmental quality depends on the total amount of pollutants, technology used and assimilative capacity of the domestic ecosystem. On the other hand, the same environmental standards across nations can have diverse environmental consequences for different countries (Pethig 1976, Bhagwati and Srinivasan 1996). The diversity of environmental regulations internationally reflects the underlying diversity of endowment, technological know-how, preferences over time, income and pollution of different varieties.[2]

Calls for harmonization and level-playing field in terms of health and environmental standards, from developed nations were accommodated in new agreements under the Uruguay Round (1986-94), e.g. Agreements on Application of Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT) in 1995. The agreements, however, also allowed departure from harmonization based on domestic environmental perceptions (precautionary principle), and this provision has been used by the North to restrict imports and support their environmental preference. Of course, a clean North-South divide in the trade-environment debate is not always obvious, given

[1] Of the 142 member nations in the WTO, most are developing countries. Least developed countries like Bangladesh and Myanmar became members of the WTO in 1995 in view of the fact that accession to the rule-based multilateral trading system will be beneficial to economic growth and development. Others like Nepal and Vietnam have observer status at the WTO. China will become a member by the year end.

the diversity (in the stages of development and priorities/ interests) of developing countries.[3] There are, however, some clear issues that have emerged in the conflict between the North's environmental interests and the South's goal of trade and development. This paper concentrates on the common issues of Asian developing countries including reduced market access, increased peripheral costs (labeling, packaging) based on industrialized country environmental regulations, and the implications of diverse risk perceptions of the new breed of GM-products.

The system of international environmental standard setting does not reflect the full participation of developing countries.[4] Given the global diversity in environmental endowment, and hence national priorities for its preservation, such an omission has both environmental and economic repercussions. For example, a standard implemented in Europe to preserve its relatively scarce environmental resource may be inappropriate for an Asian developing country where it is abundant, and hence exports banned based on such a standard would involve potential income losses for the poorer country without improving its environmental quality.

Production processes of export goods that do not have any impact on the characteristics of the final product per se have also been legitimized. Although, the unilateral import restriction of the US on shrimp from some Asian countries based on shrimp farming methods was found to be unjustified (in 1998), there is scope of similar unilateral actions. The argument for such barriers are based on global environmental concerns (e.g. olive ridley turtles in the above case), and broadening the interpretation of Article XX exceptions of GATT. Besides, Article XX exceptions, the provisions under the

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[2] While lack of safe drinking water, urban air pollution are priority problems of developing countries during the process of industrialization, the developed countries are more concerned with environmental problems of ozone depletion and global warming.

[3] There is less than a common agenda among the diverse group of least developed and developing countries. For example, food-exporting developing countries vehemently oppose the continuation of agricultural subsidies in industrialized countries, while net food-importing developing countries do not, for fear of increase in international food prices once subsidies are taken off.

[4] A survey by Henson and Loader (2001) shows that lack of technical expertise in SPS issues, lack of attendance in SPS Committee meetings, and infrastructure deficiencies were some of the major causes behind the poor participation of developing countries.

agreement on Technical Barrier to Trade (TBT) provide scope for discrimination based on non-product PPMs.

Consumer risk preferences in different countries (determined by information dissemination and interpretation of different scientific research) have to be respected and accepted by developing countries. In this regard, the precautionary principle (in SPS agreement) allows measures to be taken even when scientific conclusions are opaque. The dilemma with the precautionary principle application arises when the governments find that risk assessment needs to be made to avoid any major threat to the citizens. They "wish to remain supportive of researchers and commercial interests, which expects to benefit from the innovations that gave rise to the dilemma in the first place" (Moltke, 1999). Sound risk assessment requires a situation where there is no interest group conflict to ensure that a rigorous economic analysis is done based on scientific evidence. Such a situation is unlikely when individual country analyses are extended in the international forum. Not surprisingly there is a real threat of unjustified trade barriers in the guise of environmental protection. Such "green protectionism" that restricts developing country exports hinders development and is not good for developing country environment (if one accepts that lower level of well-being can lead to rapid resource degradation) nor has any environmental benefit for the North!

This paper analyzes how the implementation of some the environmental provisions in the WTO (in particular the SPS and TBT agreements) has adversely affected the Asian developing countries. Section 2 briefly outlines the different environmental provisions of the WTO regime, section 3 indicates the significance of international trade for Asian developing countries, section 4 analyzes the risks and barriers faced by developing countries from the use of environmental trade provisions in the developed countries, and section 5 concludes.

## 2. Environmental provisions of the WTO trade regime

The WTO's primary goal is the promotion of free and fair multilateral trade while ensuring sustainable development. I.e. "allowing for the optimal use of the world's

resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and to enhance the means for doing so in a manner consistent with their respective needs and concerns at different levels of economic development " (Preamble in the Final Act of the Uruguay Round, 1994, page 9)

Agreements in the WTO with environmental provisions have increased the scope of unilateral trade restrictions and departure from free trade compared to that under the GATT. Seven such provisions are highlighted below. These provisions have also diluted the distinction between trade measures based on product standards (legitimate under the GATT) and non-product related process and production methods, PPMs, (not legitimate under GATT).

1. The paragraphs **(b), (d) and (g) of Article XX of the GATT** provide exceptions to free trade in goods to protect the environment and human health, provided such measures are not applied in a manner that constitutes a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade. [5]
2. Paragraph **(b) of Article XIV of General Agreement on Trade in Services (GATS)** allows for departure from the free trade in services and member nations can adopt policy measures to protect human, animal or plant life.
3. The **Agreement on Technical Barriers to Trade (TBT)** allows sovereign countries to set "technical regulations and standards, including packaging, marking and labeling requirements, and procedures for assessment of conformity with technical regulations and standards" without creating unnecessary obstacles to international trade. The TBT agreement covers all technical regulations, voluntary standards and compliance procedures except when these are sanitary and phytosanitary measures. Members are required to apply product regulations on a most favoured nation (MFN) basis to ensure there is no discrimination amongst nations.

[5] There has been progressive change in the interpretation of Article XX exceptions. which has crossed over into the domain of what is considered extrajurisdictional or intrinsically domestic policies, as evident from the nuances of the legal interpretation of the article in the Tuna-Dolphin I (1991) dispute versus Tuna-Dolphin II (1994) and the Shrimp-Turtle (1998) disputes. Sawhney (2000)

4. The **Agreement on Applications of Sanitary and Phytosanitary measures (SPS)** recognizes the importance of the use of harmonized sanitary and phytosanitary measures between Members on the basis of international standards. International standards refer to guidelines and recommendations set by the Codex Alimentarius Commission, the International Office of Epizootics, and the relevant organizations operating within the framework of the International Plant Protection Convention. Member countries can, however, impose stricter standards to prevent perceived harm as a precaution ("precautionary principle" under Article 5.7) on a provincial basis even when scientific evidence is insufficient, on the basis of pertinent information. The SPS provisions give more flexibility to members to deviate from international standards than those under the TBT.

5 The **Agreement on Subsidies and Countervailing Measures** allow non actionable subsidies (i.e. neither subject to countervailing action nor to dispute settlement challenges) on environmental grounds on a MFN basis to all member countries. Thus importing country can provide financial assistance to local firms to meet new environmental regulations (upto 20% of the cost of adaptation is non-actionable subsidy) and other member countries cannot claim serious prejudice.

6. **Article 27** (paragraphs 2) of the **Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs)** allows for member nations to make certain inventions ineligible for patents, the prevention of whose commercial exploitation within their territory is necessary to protect human, animal or plant life or health, or to avoid serious harm to the environment. Article 27 (paragraph 3) also allows members to exclude plants, animals and biological processes (except microorganisms and microbiological processes) for the production of plants and animals. However, members need to provide an effective *sui generis* system or patents to protect plant varieties.

7. **Annex 2** of the **Agreement on Agriculture** lists different types of subsidies that are not subject to reduction commitments related to the environment. For e.g. direct payments to producers and government service programmes for research and infrastructure works under environment programmes.

A member nation can invoke unilateral trade restrictions on environmental grounds invoking any one or more of these provisions. E.g. the *US Import Prohibition of Certain Shrimp and Shrimp Products* from some Asian developing countries.[6] The Dispute Settlement panel (and subsequently the Appellate Body) considered the WTO Agreement as an integrated system and used all articles, agreements, preamble and annexes to judge the case. In the final verdict of the dispute, the Appellate Body reproached the US for not having engaged the complaining Asian developing countries in "serious, across the board negotiations with the objective of concluding bilateral or multilateral agreements for the protection and conservation of sea turtles, before enforcing the import prohibition". This indicated and set a precedent that if nations default on a joint environmental initiative/ agreement, then unilateral trade restriction could be justified under the WTO.

## 3. Significance of International Trade for Asian Developing Countries

For middle- and low-income Asian countries, trade comprises of a much larger share of GDP now than thirty years ago. Considering twelve such Asian developing countries, the comparison of the trade/GDP ratios for 1970 and 1999 (Table 1) shows a dramatic increases having been experienced in China (4% to 41%), India (8% to 27%), Nepal (13% to 53%), and Thailand (34% to 102%).

The agricultural sector still plays a large role in most of these economies, as the major source of employment (e.g. 71% in Vietnam, 63% in Bangladesh, 51% in Thailand, 45% in Indonesia, 44% in Pakistan in1998), but is relatively less important in terms of value added to GDP. In this respect, other sectors like manufacturing and services have become more important. The value added to GDP by the service sector varied between 33% (in China) to 52% (Sri Lanka) in 1999. Manufacturing contributed to at least a quarter of the GDP value in countries like China (38%), Indonesia (25%), Malaysia

[6] The US banned the import of shrimp and shrimp products from some South Asian countries, contending that its shrimp trawler vessels are required to use turtle excluder devices when operating in waters where there is a likelihood of intercepting sea turtles, and Section 609 of its Public Law 101-162 applies comparable standards to imported shrimp. Malaysia, India, Pakistan and Thailand sought a dispute settlement, and the verdict finally showed that the US measure constituted an unjustifiable and arbitrary discrimination on international trade under Artticle XX of the GATT (Appellate body report 1998).

(32%), and Thailand (32%). Changes in the composition of trade during the last decade support the idea that trade in manufactured products is increasingly important for developing countries.

**Table 1 Economic Indicators of Selected Asian Countries, 1999**

| *Country* | *Structure of Output (Value added % of GDP)* | | | *Trade/GDP (%)* | | *Structure of Merchandise Exports* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Agr. | Ind. | Serv. | '70 | '99 | Food | Agrl | Fuels | Ores | Mnft |
| Bangladesh | 25 | 24 | 50 | 17 | 32 | 7 | 2 | 0 | 0 | 91 |
| China | 18 | 49 | 33 | 4 | 41 | 6 | 1 | 2 | 2 | 88 |
| India | 28 | 26 | 46 | 8 | 27 | 17 | 2 | 0 | 2 | 76 |
| Indonesia | 19 | 43 | 37 | 28 | 62 | 12 | 4 | 23 | 5 | 54 |
| Korea, ROK | 5 | 44 | 51 | 37 | 77 | 2 | 1 | 4 | 1 | 91 |
| Malaysia | 11 | 46 | 43 | 79 | 218 | 8 | 3 | 7 | 1 | 80 |
| Nepal | 42 | 21 | 37 | 13 | 53 | 6 | 0 | - | 0 | 90 |
| Pakistan | 27 | 23 | 49 | 22 | 35 | 13 | 1 | 1 | 0 | 84 |
| Phillipines | 18 | 30 | 52 | 43 | 101 | 5 | 1 | 1 | 1 | 41 |
| SriLanka | 21 | 27 | 52 | 54 | 78 | 21 | 2 | 0 | 0 | 75 |
| Thailand | 10 | 40 | 50 | 34 | 102 | 17 | 3 | 2 | 1 | 74 |
| Vietnam | 25 | 34 | 40 | - | 95 | - | - | - | - | - |

Compiled from data in *World Development Indicators 2001*, and *World Development Report 2000/2001*. Components of last five columns do not add up to 100 due to unclassified trade.

The industrialized countries continue to provide the largest export market for developing countries (see Table 2). Total exports from South and East Asia and Pacific middle- and low-income countries constitute almost 13% of total world exports, and about 50% of the total exports from these developing countries are absorbed by the EU, Japan and US. Thus market access and standards/ regulations in these countries are crucial for the Asian developing countries.

In particular, for India, more than half the exports are destined for markets in the EU, Japan and the US. Environmental trade restrictions in these countries (especially of the EU and US) have significant impact on India's export trade prospects. *Based on 1996-97 trade data of India, roughly, 6% of total Indian exports were threatened by environmental measures in the EU, Japan and the US.*[7]

[7] page 202, Sawhney (2000).

**Table 2. Direction of exports from Asian developing countries as percentage of world trade, 1999**

| \Exporting countries<br>Importing regions | *East Asia & Pacific* | *South Asia* |
|---|---|---|
| EU | 1.7 | 0.3 |
| Japan | 1.6 | 0 |
| US | 2.3 | 0.2 |
| Other industrial | 0.4 | 0 |
| Other high income | 2.2 | 0.1 |
| All low income countries | 2.7 | 0.2 |
| *World* | *11.8* | *1* |

Compiled from data in Table 6.2, *2001 World Development Indicators.*

## 4.1 Implications of Environmental Provisions for Developing Country Exports

The objective of opening up markets sought through the Uruguay Round (UR) seems to be partially defeated through the channel of green protectionsim. In the agricultural sector for example, the developing countries have gained little from market opening measures under the UR agreements due to continuing tariff and non-tariff barriers (including increased subsidies to farmers under the "green box" provisions of Agreement on Agriculture and SPS measures).

Second, costs of complying with environmental stipulations like new chemicals, processes, testing, certification and packaging (under TBT) are significant for producers in developing countries. An UNCTAD study found that for the Indian leather exporters, the cost of testing and certification alone was as high as 33% of the export price.

Third, imperfect information flow and lag time in obsolescence of toxic industrial chemicals between developed and developing countries aggravate matters for exporters in the latter (hazardous chemicals come under SPS). By the time, developing countries set up the manufacture of certain chemicals, these may have been banned or restricted abroad. This *catching-up problem* was witnessed in the Indian leather industry, when the toxic fungicide pentachlorophenol (PCP) was banned by Germany (in 1989), followed by

Denmark, Sweden and the US (although at different tolerance levels). Most Indian tanneries then began using Busan 30 as a substitute of PCP, which was imported from Germany or the US, and cost several folds more.[8] In other cases, often the chemical manufacturing firms may not have got the return on their new investment, or even started production, when the substance gets banned abroad.[9]

The TRIPs agreement would only make the process of catching up with technology of the North even harder for the South. In the post-TRIP age, environmentally friendly technology has become more expensive, and corporations (mostly from the North) have patented biological resources/ knowledge derived largely from the South without paying for it ("bio-piracy").[10] Moreover, since the agreement takes into account the industrialization model of innovation, whereby invention has to be new, inventive and capable of industrial application for patentability, it does not recognize or protect the indigenous technology/ knowledge based system of the Southern farmers. This poses a serious threat to farmers in the developing countries in their informal, communal system of innovation of breeding crops and livestock.

### 4.2 What is Wrong with the SPS/TBT Provisions?

While getting into environmentally safe product lines for export is good for the domestic eco-system of developing countries[11], problems arise from the manner in which the environmental provisions are implemented in the international market. Given that information flow is imperfect across countries (and within developing countries as well) and technology is expensive, developing country exporters (typically the small and

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[8] Jha (1997). To address this problem a cooperative initiative was taken by the Indo-German Export Promotion Project, which helped in information dissemination and testing facilities.

[9] As in the case of CFC-using sector in India, which had just started production at the time when India acceded the Montreal Protocol, Sawhney (1999).

[10] Patents have already been given on genes or natural compounds from plants grown or evolved in developing countries (rice, cocoa, cassava), on genes in staple food crops originating in developing countries (maize, potato, soybean, wheat), and also plants used for medicinal and other purposes (Khor 2001). Khor also observes that many of the present day developed countries did not adopt strict IPR standards when they were going through the stages of development that the developing countries of today are attempting to go through.

[11] Environmental management systems e.g. ISO 14001 certification, though not mandatory has become popular, and essential to project an environmentally friendly image of a firm in the market. Such certification also helps firms to comply with national environmental legislation within the developing countries.

medium) find it difficult to keep up with the changes in new environmental stipulations and requirements. The survey of ten developing countries (Asian, Latin American and African) showed that infrastructural constraint in developing countries limit not only their ability to comply with SPS requirements, but also the ability to demonstrate compliance (Henson and Loader 2001). Knowledge of SPS is also poor in the food supply chain in these countries.

Second, the environmental provisions under the TBT and SPS agreements, in particular have legitimized trade barriers based on non-product related PPMs too. Eco-labels (under TBT) focus on PPM criteria that often do not affect the intrinsic characteristics of the traded end products have emerged as a discriminating criterion in the international market.

Not surprisingly, developing countries have become suspicious of non-product related PPMs being disguised protectionism, when the environmental standards involve costs that offset their comparative advantage or when there is no environmental benefit for the developing countries. This happens when stringent environmental standards in developed countries do not match the resource endowment and environmental preferences of developing countries. A potential exporter in the developing country may find the process of adaptation counter to the comparative advantage of the exporting countries. E.g. importing inputs like recycled paper from foreign countries to conform to foreign regulations on packaging is expensive, and packaging could have been done with environmentally friendly material (say, jute) available locally. Such eco-labelling criteria inadvertently favour technology and material inputs of the label granting country.[12]

Third, the proliferation of numerous eco-labels in the global market reflects proliferation of eco-branding. Such a trend is good for the consumers (offering choices among differentiated green products) only to the extent that the products genuinely differ in terms of environmental impact (i.e. the basis of eco-labelling and reason behind premium

[12] ESCAP (1997), page 12. This has been called a "de facto" discrimination against developing countries through the use of environmental standards in the North.

prices of greener products). Otherwise the market is inefficient and consumers are paying premium prices without an offsetting environmental benefit! *In such a case the primary goal of ensuring free and fair trade of the WTO, to improve efficiency in both production and consumption, is defeated!*

Fourth, under the exceptions permitted in the SPS agreement, deviations from international environmental and health standards have been practiced by industrialized countries, which adversely affects agricultural and fishery exports from developing countries. E.g. EC's standards are more stringent than Hazard Analysis Critical Control Point (HACCP). The fragmentation of the resulting export markets for developing countries based on diverse environmental certification (for the same product group) is costly, since consignments rejected in one country is sold to another country within Europe where the standards were met.

### 4.3 The Export Sectors under Threat from SPS/TBT Agreements

The traditional export product groups of developing countries have been most affected by the environmental and health-related regulations of the North, including fishery products, food/beverage products, coffee and tea, yarn, textiles, garments, cotton products, and leather products. Manufactured goods and agricultural produce have come under attack through TBT and SPS measures (due to say, pesticide residue). Agricultural products have also been banned due to content of genetically modified organisms (GMOs) in Western Europe.

Table 3 highlights the traditional export product groups of India that have come under attack in the EU, Japan and the US on environmental grounds in 1996-97. In June 2001, the Indian Commerce Ministry noted that non-tariff measures/barriers have affected the Indian exports of fresh fruits, coffee, meat, rice, tobacco, coir products and even herbal medicines.

Similar trade restrictions have been faced by other Asian developing countries. These challenges induced changes in both domestic legislation (like banning of azo dyes, or making turtle excluder devices mandatory for shrimp trawlers in India), and production processes in these countries (e.g. Bangladesh upgraded shrimp processing to ensure HACCP compliance). Thus, wherever biodiversity, human health and/or hygiene seemed to be at risk, the developing countries have made efforts to change production practices.

**Table 3 Environmental Trade Provisions Invoked by Industrialized Countries on Indian Exports, 1996-97**

| Commodity group | EU | US | Japan |
|---|---|---|---|
| Agricultural (fruits, vegetables) | GMO, SPS | Labelling | Labelling |
| Beverages (tea, coffee) | Pesticide residue | | SPS |
| Dairy products | GMO, SPS, SRM | SPS | - |
| Fishery products | SPS | SPS | SPS |
| Leather products | Use of Azo dyes | Labelling | - |
| Textile (yarn, apparel, jute bags) | Use of Azo dyes | Labelling | - |

Compiled from CMIE trade data reported in Tables 5 and 6, Bhattacharyya (1999)

**A. Trade in manufactured goods**

Manufactured products constitute more than 50% of total merchandise exports of Asian developing countries and numerous eco-labeling schemes across the industrialized countries have introduced uncertainty in the international market for developing country exporters. Without harmonization or a system of mutual recognition, multifarious eco-labels with differing criteria lead to market fragmentation and additional economic costs of adapting exports to different markets.

A study on the effect of eco-labeling adopted by EU on developing countries (Zarrelli, 1997) showed that the share of developing countries in total imports (of EU) restricted under eco-labels was 44.9% in 1992. Three sensitive products group of which developing countries were major suppliers to the EU market included: shirts, T-shirts, bed linen and footwear.

## B. Trade in agricultural and fisheries products

Food and agricultural product exports are major exports for Asian developing countries like Sri Lanka, Thailand, India, Indonesia and Pakistan; constituting 23%, 20%, 19%, 16% and 14% of total merchandise exports respectively of these countries in 1999. Given differential risk perceptions across the North, the stipulated tolerance levels for various pollutants are different across countries, and the SPS agreement allows members to invoke stricter standards of health and environment. This departure from harmonization on part of the North (which had been insisting on a level playing field and harmonization in terms of environmental standards) only increases the costs of adjustment for exporters in the developing countries. E.g. the elaborate testing of goods before entry and compulsory certification in countries like the US is rather complex and increase uncertainty among the expo.ters from developing countries. Moreover, the American environmental standards are higher than the international norms.

The quarantine and SPS requirements in the US have resulted in a practical ban on imports of Indian mangoes, grapes among other fruits into the US. A new ochrotoxin limit on the import of coffee has been enforced in the EU, and coffee rejected by one EU member is then taken at a discount into another, which in the process causes loss of foreign exchange.[13]

Fishery products from India and Bangladesh have faced bans in the Europe under HACCP (in 1997). While up-gradation was required in several processing plants in these countries, it must be noted that the EC standards are more stringent than the international HACCP. For example, when the EU banned the import of shrimps from Bangladesh in 1997, the exporters were able to recoup some of their losses by redirecting consignments to the US and Japan markets[14] where the products were acceptable according to their standards.

[13] "NTBs scuttling farm exports: report", page 18, *The Economic Times*, Bangalore. 28 June 2001.
[14] Rahman (2000).

## C. Trade in GMOs

The use of GM-seeds in developing countries (bought from MNCs to attain higher agricultural productivity) cut off export markets in the EU countries where there are restrictions in the import of GMOs. Eg, in 1996-97, the EU invoked GMO-based trade restrictions on a range of fresh fruit/vegetables (including bananas, mangoes, and grapes), rice and dairy exports from India. This can be called a *double- whammy* effect on developing countries derived from the TRIPs and SPS measures of the WTO!

In the last decade there has been rapid development of biotechnology, and the genetically engineered foods (soybean, maize, tomato, rapeseed, cotton, potato, tobacco) are being sold in the market. Transgenic crops are mainly being developed and grown in North America (the US with 72%, and Canada 10% of the total crop area devoted to GM-crops in 1999). Developing countries like Argentina and China also undertook accelerated adoption of GM crops (Argentina with 17% and China with 1% of the world's total crop area in 1999).[15] However, developing countries may face problems in trying to cultivate GM-crops (say drought resistant rice) to ensure food security since private sector in developing countries may not find the investment in biotechnology profitable without aid (Nielsen 2000).

The health and environmental effects of GMOs and their products are still not completely understood by the scientific community and differences persist in risk perceptions in Western Europe versus North America.[16] Thus, while the large multinational corporations (mostly American) are commercially releasing a wide range of these GMO-based products in the developing countries, the latter are at risk since adequate information and/or safety regulations for such products are grossly lacking![17]

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[15] page 4, Nielsen and Anderson (2000).

[16] The US FDA does not distinguish between foods produced from genetically modified crops and food produced from crops developed by other technologies, and hence no labeling is required because of genetic modification. On the other hand, the EU requires labeling of all foodstuffs, additives and flavours containing 1% or more genetically engineered material (Regulations 1139/98 and 49/2000). Neilsen and Anderson (2000), page 7.

[17] In June 2001, Greenpeace International sounded an alarm on detecting GMO ingredients in two popular food products – Proctor and Gamle's Pringle's Potato Chips and Abbott Laboratories' Isomil Baby food – freely sold in the Indian market, even though such sales are not allowed without prior approval of the authorities. While Proctor & Gamble and Abbott had assured European consumers of GMO-free ingredients in food products, but they do sell products containing GM ingredients in India, Philippines and Thailand. *Economic Times*, Bangalore, June 7, 2001.

So while the EU-US differences in risk perceptions of environmental/ food safety of agricultural biotech products continue, the developing countries are caught in a web of uncertainty in trying to tackle problems of food-security, environmental safety, human health and export growth.

### 4.4 The export opportunities

The implications of greening of world trade would be incomplete without highlighting the opportunities that have opened up with this change. Green products are typically value-added products and sell at a price premium.

Besides the changes that can be incorporated in existing export goods, newer products can be developed in which developing countries have a comparative advantage. The Asian developing countries have a wealth of traditional nature-based knowledge in agriculture, medicine and beauty care, which can be explored to boost production and export green products. Secondly, after the era of boosting agricultural productivity with chemical fertilizers and pesticides, and facing diminishing returns, developing countries have begun to realize that organic farming hold promise both in terms of environmental benefit and market opportunities.[18] Finally, Asian developing countries also have diverse and beautiful terrain and waterways that can be preserved and promoted for tourism sector more aggressively.

- Given the existing relatively large agrarian base of some of the Asian developing countries (e.g. Bangladesh, India, Nepal, Pakistan, Sri Lanka and Vietnam), organically grown food and beverages can increase. Agro-industries specializing in natural products (free from GMO) have large potential markets not only in the industrialized countries but in developing countries too, since consumers around the world are wary of GMO-based products.
- Nature based health-care and cosmetic products have been successfully commercialized and have a growing consumer market both in developed and developing countries.

[18] Chemical runoff and poisoning of freshwater as well as groundwater have been common problems.

- The demand for biodegradable chemicals used in cosmetics and biodiesel fuel is expected to increase the non-food uses of vegetable oils and fat (e.g. palm oil). Asia is the world's largest producer of oleochemicals (derived from vegetable oils) with a 36% share and is expected to account for half of the world's production by the end of this decade. Malaysia, by far the largest producer of palm oil, is set to open the largest bio-diesel plant in a couple of years. [19]
- Farmers have used organic insecticides and pesticides for centuries in Asian developing countries, and thus these countries have a real comparative advantage in the knowledge of such product lines. These can be explored commercially more aggressively, and this will also take care of threats of bio-piracy of indigenous resources and knowledge in the future.
- There is potential in the expansion of eco-tourism in the Asian developing countries that have a wealth of pristine environmental resources (whose preservation and promotion is good for global bio-diversity too).

## 5 Concluding Remarks

More than half the world's population is housed in the Asian developing countries but the average per capita income is meagre [20] (less than one-twentieth of the average per capita income of European industrialized countries). Thus growing out of poverty and improving the quality of life (which involves improving environmental quality) is an urgent need. *Better access to international markets for their export products, and freer flow of environmentally friendly technology to upgrade their production systems are essential catalytic inputs in their process of sustainable development.*

The developed and developing nations of the world have a common agenda, namely the sustainable development of the global economy from the Earth Summit pledge taken at

[19] Vegetable oils like palm oil are processed into oleochemicals and compete with petrochemicals for use in paints, inks, plastics, soaps and cosmetics. The use of vegetable oils and fats in non-food industry is expected to soar by 70% in this decade, according to a Malaysian scientist. *The Economic Times*, Bangalore, 21 June, 2001.

[20] In 1999, average per capita income of developing countries in South Asia was $440 and in East Asia & Pacific was $1000, compared to $22,640 in the EU, $30,600 in the US and $32,230 in Japan.

Rio in 1992. Given this starting point, mutual recognition and a cooperative approach to problem solving of trade-environment conflicts is the best approach. In this regard, it is a positive sign that some industrialized countries (e.g. Norway and EC) have recognized the adverse impact of environmental trade provisions in the WTO. Norway and EC have admitted that certain measures may have a negative impact on the exports of developing countries, even if these measures were taken to address genuine environmental concerns (CTE meeting February 2001)

Cooperative efforts to green the supply chain in Asian developing countries (where inadequate information, technology and finance are all constraints) are probably the best option. Such initiatives can be taken jointly by the exporters and importers in bilateral trade relations, given the fragmented nature of the export market.

The Northern countries need to adhere to their call for harmonization in international environmental standards subsequent enactment through the WTO agreements (eg. the Codex,). Departure from harmonization, and invoking of diverse standards and labeling requirements in the industrialized countries only increase adaptation costs for exporters from developing countries. The precautionary principle (within the SPS) needs to be clarified for use at the international level, other wise there will remain a large potential for misuse and departure from an efficient multilateral trading system.

Increasing participation of developing countries in standards-making bodies is a good start In this regard, the FAO has made an effort to help India to enhance expertise within the country and improve representation at the international level. Also, India and Norway made a joint proposal at the Codex Committee on Food Labeling (in 2000) on the criterion of labeling GM-products (other two proposals were made by the US and EU). Developing countries need to build in their environmental conditions and priorities into the international standards and only then can the *global diversity in environmental endowment and knowledge* be accurately reflected in global trade.

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