Environmental Conditions in International Trade

IMPACT ON INDIA'S EXPORTS IN THE AREA OF TEXTILES AND GARMENTS INCLUDING CARPETS, LEATHER AND LEATHER GOODS, AGRICULTURAL AND FOOD PRODUCTS INCLUDING TEA, AND PACKAGING

- A Study for the
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PREFACE

This study was done at the behest of and for the Central Pollution Control Board under the Ministry of Environment & Forests, Government of India, by the Consumer Unity & Trust Society (CUTS). CUTS is a leading non-government organisation in India, *inter alia*, deeply involved in issues relating to international trade policy. It is the co-convenor of the Consumer International's Global Policy and Campaigns Committee on Economic Issues, and in that capacity has interacted with and represented CI in various international fora relating to trade. CUTS also serves as a member of the CPCB's Technical Committee on the Scheme for Environmental Friendly Labelling of Products.

The Study was done mainly through extensive literature survey; several thousand extracts were obtained from publications, newspapers and magazines. Interviews were also held with officials of the US Environment Protection Agency, US Consumer Products Safety Commission, Washington, the Directorate General - XI of European Commission, Brussels, UNCTAD and International Trade Centre in Geneva and experts on trade and environment in western nations.

The object of this study is multifold: Firstly, it aims at raising awareness and providing information to industry in India on the emerging conditionalities in international trade on environmental considerations and consumer safety. This study is restricted to four major export industries in India: Textiles, agricultural and food products including tea, leather and leather goods, and packaging. The study does not look into the other contentious aspect of social concerns like labour exploitation, but such concerns will run across the board.

Secondly, it aims to inform consumers, trade and industry, and policy makers in India about the concerns which are being raised by consumers, and 'protectionist' manufacturers in industrialised countries in relation to environment and safety, and their validity.

Thirdly, the document aims to educate people in developed nations and international and inter-governmental organisations on how industries in India will comply with these conditionalities and what support they can extend to cope with the new challenges. The support can include appropriate phasing of compliances, transfer of environmentally friendly technologies, and, most importantly, the measures for transparency and consultation while setting new and stringent norms. Thus the study is also a contribution to the international contentious debates on the linkages of trade with environment.

The authors wish to acknowledge the encouragement of the CPCB who commissioned this study and all those, who are innumerable, who helped us with information, as well as the published sources which have been referred to at the end of each chapter.

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Table of Contents

CHAPTER 1: OVERVIEW

1.1 Background

Protecting the environment is all set to become the central organising principle of the 21st century. Because the society has started to grapple with many of the man-made environmental upheavals that have characterised the second half of the 20th century.

The "greening effect" is already felt in many fields of human activity. Scientists still disagree about the extent of the macro damages brought about by increasing human activities on the environment. Yet, it has not stopped the society to develop solutions to tackle the emerging problems. Example: the Montreal Protocol to phase out the use of ozone-depleting chlorofluorocarbons in the atmosphere, steps leading to measures to slow down global warming.

With the break-up of the Soviet Union, the world got firsthand evidence about the impact of industrial pollution which has practically ruined the beautiful countryside. More evidence is now available from across the world about the harmful effects of intensive agricultural practices. Then there are examples of increasing smog levels in cities across the world, oil spills, garbage-filled mountains, tourist spots and beaches.

Solutions have started to come from different sections of the society. Some are: new environmental curricula in American schools, increasing use of environment-friendly packages in supermarkets around the world, ever increasing numbers of television documentaries and chat shows on environment and emergence of eco-friendly tourism. Other institutions such as the arts, legal systems, social customs, fashion industry are also accommodating to new environmental imperatives in different ways, at different speeds, in various parts of the world.

Of late, world's economic institutions are also facing the impact of these far-reaching environmental changes. Now environment-linked factors play a major role in the way economic assets are valued, the way products are made, the way raw materials are chosen, the kind of things people buy, the way in which managers and planners function. Some economists even call this the second part of the Industrial Revolution.

Just as industrial revolution took root in different parts of the world in different stages, environment revolution, too, is following the same course. Every national economy today is obliged to adjust to new environmental realities but each reacts in its own pace and in ways strongly influenced by indigenous factors.

India too cannot resist the change. As its economy is getting into the global stream, it has to change the way it does its business. There are already signs of some of these environment-related changes thrust on India: German demand to supply only pesticide-free tea or textiles without the harmful azo dyes. American demand for compliance with the new ISO 14000 standard on environment management systems for manufacture of export goods. The most portentous demand is on bringing in Product and Process Methods (PPMs) as conditionalities for meeting environmental standards.

Pressured by NGOs and protectionist elements in developed countries, the new General Agreement on Tariffs and Trade (GATT) is already discussing the bringing in of environment related factors into the global trading system. This is happening in spite of the fact that the treaty's main purpose is to ensure global trade without barriers, and an agreement on Technical Barriers to Trade exists. What India has gained in terms of increased market access through the new GATT may be lost through environment-linked barriers. Especially vulnerable are some of India's emerging export sectors: textiles, agriculture goods, packaging and leather.

Developed countries, mainly the United States of America, Japan and the European Community have evolved many environment-related guidelines that will regulate trade. The increasing "green" consciousness among the people in these countries have also prompted their governments to bring in such regulations. In fact, "green shopping" has become one of the latest fads in many western societies.

Some of India's export items are targeted to grab the attention of these affluent shoppers in the west. So even if we scream about the unfairness of environment factors being thrust on us, we cannot ignore what consumers abroad demand. So India needs to be constantly watching and monitoring the developments taking place abroad and the voluminous guidelines that govern trade and environment.

According to the former GATT negotiator for India, B.K.Zutshi, some 400 environmental regulations have been notified to GATT because they risk causing significant adverse trade effects. These cover domestic sales, restrictions on hazardous products, environmental packaging, marking and labelling requirements, waste disposal regulations and requirements, and many more. Yet none of these has been challenged in GATT on commercial grounds although contracting parties are keeping under review developments in this area.

The impact of environmental standards on market access and the possibility of these becoming non-tariff barriers to trade is a special concern for developing countries. Exporters from these countries are anxious that their products will be denied access or that they will have to incur high adjustment costs in order to maintain access to overseas markets.

1.2 Product standards and environmental protection

Standards as applied to products and to the environment can take a wide variety of forms. In the case of products, national and international technical standards fixed for the purpose of specifying characteristics such as levels of quality, performance, dimensions, symbols, testing methods and labelling requirements are long-established. Fixing of such standards is generally in the interest of industry, commerce and consumers in that they ensure comparability in many respects between products from different manufacturers and from different countries and lay down common methods of measuring product characteristics.

However, in addition to standards that are concerned with technical specification of products, requirements are also imposed on aspects such as composition, labelling, sale and disposal, etc. with the objective of reducing or eliminating their potential damaging effects. Three broad areas of concern can be identified: health, safety and the environment. The oldest and best-known requirements are those that aim to protect the health of consumers. Current examples include controls on additives in food products and the use of formaldehyde in the manufacture of chipboard.

With regard to safety requirements (including standards designed to improve the safety of employees involved in the manufacture of products), the past two decades have seen a sharp increase in the number of prescribed standards. An example is the requirement of passenger cars to be able to protect occupants from the effects of a collision. The need to impose controls in order to mitigate the damaging effects that certain products can have on the environment is of more recent concern, although this type of product standard is rapidly becoming the focus of widespread interest. Perhaps the best-known example is the imposition and progressive tightening of exhaust emission standards for motor vehicles.

Environmental protection is therefore one of several factors that play a role in the setting of product standards. Conversely, product standards are but one of the many different kinds of standards that are applied for the purpose of environmental protection. These range from source standards (such as process or emission standards, including product standards), to environmental standards (such as environmental quality standards) and target standards (such as biological or exposure standards).

Environmental product standards therefore have two distinct purposes: they act to reduce or eliminate adverse impact of a product on environment and they ensure that certain common requirements apply to all products of a particular type. It is important to appreciate that the weight given to these two factors in the standard-setting process can vary widely for different products and for other considerations - such as protection of health and safety, which can also play an important role. Therefore, at the time of review of an existing product standard, it may not be readily apparent to what extent the product standard was originally set up as a measure for achieving technical harmonisation, environmental protection or for health and safety reasons.

1.3 Environmental product standards and international trade

Product standards may be determined by commercial, technical, health, safety and environmental criteria. But in addition to the need for commercial harmonisation, technical standardisation and the elimination or reduction of potentially damaging effects are also important. The requirements imposed on a product are crucial variables in determining the extent to which the product can be traded in different markets. National product standards can act as barriers to the import of foreign products that do not meet the respective requirements. An international standard, by contrast, removes barriers to trade through establishing uniform specifications and thereby opening national markets for international competition. This dimension is in practice an important stimulus to the development of product standards. Industry, with a general corporate interest in free trade has for many years actively participated in standardisation activities, including the work of international standardisation bodies.

It is now becoming widely recognised, both in commercial and environmental circles, that international trade issues also have important implications for environmental protection. Many countries have imposed national requirements on products for environmental reasons, and these standards can act as impediments to free trade, keeping away products from other countries which do not meet the respective standards.

A well-known example is the introduction of a mandatory system of returnable bottles in Denmark, which led to disputes over the issue - whether the requirement to sell drinks in returnable bottles discriminated against foreign producers. The matter was referred to the European Court of Justice in 1988. An example of more recent times is the decision of the US government to ban the import of Tuna fish from Mexico, Venezuela and Vanuatu, and from the intermediary countries like Costa Rica, France, Italy, Japan and Panama, on the grounds that the fishing methods caused the death of large numbers of dolphins. In this “Tuna-Dolphin case” between the US and Mexico, the GATT panel decided that import restrictions could not be justified by referring to the ecological damage caused by the production process.

The growing number of national product requirements in the industrialised countries relating to environmental protection has in recent years stimulated an international debate on the extent to which trade should be restricted by national claims for special environmental protection requirements. The debate also focuses on the most appropriate arrangements for further international

harmonisation of environmental product requirements. The debate has focused in particular on the role of the GATT in this respect, on EC policy and on proposals to incorporate environmental criteria into technical standards.

1.4. Prohibition of hazardous substances

A direct way of controlling the environmental impacts of products is to limit the use of hazardous substances, either for all applications or for certain specific applications. For example, limit values may be set for the concentration of certain hazardous substances in products. Among the substances which are generally prohibited in most countries are PCBs, PCTs, benzene, benzidine, 4-nitrobiphenyl, 4-aminobiphenyl, DBB, DBBT, PCPs and Ugilec.

Certain hazardous substances may be regulated in some countries and not in others, and the limit values themselves may also vary. Scandinavian standards for hazardous substances seem to be somewhat stricter and Japanese standards laxer than European standards in the main, while vehicle emission standards are more elaborate and considerably stronger in the US.

1.5 Labelling

A variety of product-labelling requirements for chemical substances and pesticides exist in most countries. These aim to inform consumers of a product's characteristics and cautions. Traditionally, however, labelling requirements are primarily concerned with a product's impact on health and safety. Only recently labelling for environmental reasons has been developed.

The information to be included on the product and/or its packaging may concern the use of hazardous substances, possible environmental effects during the use of the product and the appropriate (or inappropriate) means of disposal. A good example is the compulsory environmental labelling of nickel-cadmium cells and detergents in Norway that is comparable to labelling systems for carcinogenic products. The system is to be extended in the future to other environmentally hazardous products. Similarly, Swiss environmental legislation provides for a special information system for chemicals. The duty of self-regulation obliges manufacturers of new substances that might cause an environmental hazard to investigate the possible environmental impacts of the substance before the product is marketed. The results of this research must be passed on to both governmental authorities and consumers. With regard to consumer information, special logos have been developed, such as for products that are toxic to bees or to fish. For many products, such as batteries, cleaning agents, fuels containing additives, refrigerators and asbestos, legislation lays down in detail which information must be provided.

1.6 Eco-labelling

An instrument which is currently gaining popularity in almost every country covered by the study, is eco-labelling. Products that satisfy high environmental standards can be awarded such a label, with the objective of encouraging consumers to purchase less environmentally damaging products. The criteria that determine whether a product meets high environmental standards generally relate to the environmental impact of a product over its entire life-cycle. Contrary to the traditional type of labelling, which gives information of a more negative character (consumers are warned against certain negative effects of a product), the eco-label is intended to give a positive message to the consumers. In 1978, the first eco-labelling scheme was established in Germany (Blue Angel). Criteria for obtaining the Blue Angel label have been established for 62 product categories. About 4000 products have been awarded the label.

Norway, Sweden and Finland introduced a harmonised eco-labelling system under the Nordic Council programme in 1991 (the Nordic Swan). In the case of the Nordic Swan, criteria for 14 product categories have been developed. About 55 products have been awarded the Nordic Swan label. And the labels are recognised by a large portion of consumers (upto 80 per cent in Germany). More recently, many other countries have followed and are following these examples by establishing their own eco-labelling systems. Examples include Japan (the Eco-mark), Canada (Environmental Choice Programme) and Austria (the eco-label). The European Community has also introduced a community eco-label that is designed to operate across the twelve member states. This has not, however, prevented some member states, such as Netherlands and France, from introducing their own national labels.

India too started an eco-labelling scheme in 1990. The Central Pollution Control Board has identified 16 product categories for the labelling scheme. The "Ecomark" scheme is similar to the labelling schemes elsewhere and provides Indian industries an opportunity to design their products to conform to high environmental standards. Any product that gets an Ecomark will be in better position to compete in the international market.

Several different approaches to eco-labelling can be distinguished. However all schemes follow a stripped down life-cycle analysis approach i.e. cradle-to-grave, concentrating on a few of the major environmental impacts. Under most recent eco-labelling systems, the label is awarded to a product which is determined to be less damaging than other comparable products, although the requirements which a product must meet to qualify for a label differ considerably in the various eco-labelling programmes. The Austrian eco-labelling system, for example, sets relatively high standards, with the objective of granting eco-label only to products at the top-end of the market. The requirements for the Japanese Eco-mark,

on the other hand, seem to be less stringent.

1.7 Conclusion

This report documents the environment-related guidelines that deal with trade in some of the export sectors which are of crucial importance to India. Chapter-II deals with the environmental impact on trade in agricultural goods. Agriculture has been at the centre stage of GATT discussions since 1986 and Indian exporters have to be wary of the emerging environmental factors that affect agriculture.

Chapter-III deals with the changes that have been adapted by the leather industry when environment and health factors began to influence international trade in this area. India expects to earn at least Rs 5000 crores from leather exports. Some of the new factors that may affect trade in leather goods are mentioned in this chapter.

Textiles is a major foreign exchange earner for India. Chapter-IV provides an analysis of the factors that will have an impact on trade in this sector.

Chapter-V is a detailed account of the trends in the world's packaging industry. In fact, the environment movement began in 1970s to counter the hazards caused by the accumulation of non-degradable plastic packaging materials. The movement has since branched out into new areas. But the packaging industry continues to be under the microscopic watchful eyes of environmental groups.

It emerges from the document that most of the countries have laid down strict environmental criteria for a variety of consumer products, and these are applicable to products manufactured by their own industries as well as those imported from other nations. So there is an urgent need to tighten the environmental standards in India and put it on par with those elsewhere. Any relaxation of these standards for the domestic industry may prove to be counter-productive as it will damage the crucially needed exports.

CHAPTER II: AGRICULTURE

2.1. Background

Agriculture has been a major contentious issue in the new round of world trade talks from the beginning of the Uruguay Round of talks at Punta del Este in 1986.In the final round of talks, environmental linkages to trade issues too started to occupy centrestage.

The impacts of trade flows and policies on environmental quality in agriculture have many features which make them difficult to resolve. In many respects, the same domestic agricultural policies which are at the root of trade distortions also encourage environmental damages. Hence, reforming these domestic and trade policies would be partial, though not a complete step in the direction of greater environmental benefits.

2.2.1 Importance of agriculture in India's exports

Agriculture exports is crucial to India. It accounted for nearly a fourth of the total exports in 1994. The next big surge in exports for the country has to come from this sector only. Among India's relatively small portfolio of agricultural export items, coffee and marine products stand out for extremely high growth rates. In the case of coffee, for example, the exports have risen by a whopping 174.4 per cent from Rs 282 crore ($88 million) to Rs 771 crore ($241 million). Given the fact that at the same time tea exports declined from Rs 740 crore ($231 million) to Rs 650 crore ($203 million), coffee has become the country's major plantation export item.

Marine products exports have increased by a sizable 44.5 per cent from Rs 1,500 crore ($469 million) to Rs 2,170 crore ($678 million). Apart from tea, other agricultural products that have done badly are tobacco (down 52.3 per cent), oil meals (by 17.8 per cent) and sugar and molasses. On the import front, bulk imports continue to dominate, but this in large measure was due to the imports of sugar and edible oil forced by domestic shortages in 1994.

2.2.2 Side-effects of agriculture on the environment

Market failures in agricultural production and consumption have widespread effects on soil, water, human health and natural ecosystems which are difficult to monitor and therefore to estimate. These market failures are generally reinforced by government policies which distort the prices of agricultural products and inputs (electric power, water, fertilizers, pesticides). These distortions occur in agriculture to a great extent than in many sectors of both developed and developing countries.

In comparison with other sectors, the impacts of agricultural trade on environmental quality reflect a double dilemma. Agricultural production is replete with examples of market failure, that is, the prices of inputs and outputs in agricultural markets do not fully reflect the social costs of soil and water depletion, deforestation, and other adverse impacts on the environment.

2.2.3 Agricultural policy distortions and environmental impacts

In this section, some concrete examples of trade flows in agriculture and their environmental impacts are discussed, focusing first on developed and then on developing countries' policies. In both cases, the relationship between domestic agricultural and trade policies, and environmental damages, is complex. While growing agricultural trade in the post-war period has added to general pressure on land, water and forest resources, this volume of trade has also responded to important demands. On the one hand, it has occurred in response to domestic and foreign population and income growth. On the other, it has resulted in agricultural and related trade policies which have artificially supported the prices of some crops relative to others, and subsidized the prices of many inputs, such as water, fertilizers and pesticides.

Broadly speaking, it is the commodity composition of agricultural production, together with the increasing use of water, fertilizer and chemical inputs, which account for the majority of environmental concerns in agriculture. Commodity composition refers simply to the mix of farm products produced. Agricultural production has become increasingly specialized at the farm level since the 1950s, especially in the OECD countries. Specialization occurs naturally in the course of trade, but the degree of specialization at the farm level in such crops as maize or cotton, as well as the concentration of livestock production in limited geographic areas, has been driven in many developed countries less by market demand than by domestic and related trade policies that subsidise this narrow production focus directly and indirectly. The increasing use of chemical inputs has occurred in large part because of the compulsions to cater to the ever-growing market demand for farm outputs irrespective of whether the demand arises in the market or from government subsidies and purchases.

As it happens, the same crops which governments had subsidized have accounted for the bulk of irrigation, fertilizer and pesticide applications. In addition to the derived demand for water, fertilizer and chemicals, many governments have further subsidized the use of these inputs by tax allowances or price markdowns that make them less expensive to use.

Many of these changes in production, especially in developing countries, have been justified as necessary to feed growing populations or to increase food self-sufficiency as a matter of trade policy and national security. The result was that adverse environmental consequences were treated as unfortunate but probably justifiable by-products (externalities) in meeting these challenges. As this perspective changes, especially in the OECD countries, the demand for new environmental regulations will effectively raise the cost of environmentally irresponsible farm production methods, inducing new, more environmentally benign technologies.

However, this process is just beginning, and the market and government failures of the post-war period have clearly generated substantial environmental damages. And as long-term population growth continues to require increase in food production, environmental issues in agriculture are likely to remain important.

2.2.4 Environmental policies and impact on agriculture

The United States, the European Union and Japan make the world's largest market for agricultural commodities. So whatever happens there has a major influence on the attempts of India and other developing countries to grab a slice of this huge market.

Three main issues dominate the US environmental policies which in turn affect the agricultural sector. The first is water pollution. The Environmental Protection Agency of the US has identified agriculture as the largest nonpoint source of surface pollution. As Clark et al. (1985) note:

"In addition to biological damages, the off-farm cost of agricultural runoff from increased flood damages, impaired recreational opportunities, and interference with water conveyance facilities, industrial and municipal uses has been estimated at Rs 6,400 crore ($2.2 billion) per year."

The second and related issue is the safety of groundwater supplies. Approximately 50 million people in 143 countries rely on potentially contaminated groundwater for drinking. These problems tend to be localized in areas of concentrated agriculture and/or specific geological formations that are conducive to rapid transport of contaminants to the water table.

The third area of concern is fragile land areas such as wetlands and native prairies. Approximately one million acres of wetlands are drained each year, the vast majority for agriculture, threatening the breeding ground and habitat for approximately two thirds of the major commercial fish species and many types of waterfowl.

2.3 Piercing the US Market

2.3.1 Eco-barriers facing exports to US

The US has erected many barriers related to sanitary and phytosanitary conditions to discourage entry of agricultural items from other countries into its market. According to a report prepared by the European Union, the US guidelines on sanitary and phytosanitary requirements can have highly restrictive effects on trade.

For instance, US insists on zero pesticide residue levels for substances which have not been approved for use in that country. Or those for which no import tolerance has been established even where these substances are manufactured in the US and exported to foreign countries. In some cases, time-consuming or unduly delayed approval procedures have led to trade disruption.

All these restrictions apply equally to any product from India and so exporters have to be aware of what is in store for them when they attempt to penetrate the highly developed US market.

In February 1990, the US Food and Drug Administration (FDA) found residues of a fungicide "procymidone" in imported wines. The fact that the manufacturer had not applied to the US Environmental Protection Agency (EPA) to have a tolerance fixed for this product led to an effective Zero tolerance level being imposed. This situation prevailed despite the fact that a scientific advisory panel subsequently found that the health risk to consumers of wine with residues of procymidone is negligible.

In July 1992, the Californian Court of Appeals effectively ruled the EPA's risk policy as illegal. This ruling would have the effect of rejecting fresh or processed food products containing residues of more than 35 frequently used pesticides.

Since then, the US government has presented a proposal to Congress on widespread reform in pesticide legislation including the Delaney clause which imposes a zero level for any cancer-inducing residue.

India does not export many horticultural items to the US now. But if it wants to do so at a future date, exporters should be aware of the problems faced by European manufacturers in piercing the US market.

Table olives and pickled vegetables from certain European countries, despite the fact that they constitute products of natural fermentation, are considered by FDA to be either low acid or acidified, resulting in the obligation on their producers to register with the FDA. Regulations of both the International Council of Olive Oil and the Codex Alimentarius of the Food and Agriculture Organisation of the United Nations, state that olive oil and pickled vegetables are natural products for which the fermentation in brine leads to a slight natural level of acidity, rendering it unnecessary for acids or other chemical preservatives to be added. Yet the obligation to register with the FDA hampers trade.

2.3.2 US sanitary barriers

The US rules on import of animal products and byproducts from countries where Bovine Spongiform Encephalopathy (BSE) exists contain three requirements concerning ruminant animals:

1. That the meat does not originate from any animal which has been in a country in which BSE exists during a time when the country was permitting the use of ruminant meat and bone meal for the feeding of ruminants.
2. All meat has to be deboned and all visually identifiable lymphatic and nerve tissue have to be removed.
3. Each animal has to be inspected prior to slaughter by a veterinarian and found free of neurological disorders.

Here, the US standards are more stringent than those approved by the International Office for Epizooties (IOE). The US measures go beyond IOE regulations on important points such as:

a. US does not make any distinction between countries with low or high incidence of BSE. This was reiterated in the September 7, 1993 rules which banned import of animal casing from all countries listed by the US as having BSE.

b. Double requirement of deboning and the ban on meat from animals born prior to the ban.

Through insistence on non-comminglement, US requires that establishments exporting animals, meat or meat products to the US do not handle at the same time, animals, meat or meat products from countries which are not recognised as free from relevant diseases and that there is no mixing of meat or meat products destined for the US with that for other countries.

Exports of uncooked meat products such as sausage, ham and bacon are subjected to a long-standing prohibition, only part of which may be justified on health grounds. Similarly, egg products are only allowed under very strict conditions. One of these requirements is the continuous inspection of the production process. This is superfluous and expensive and has a negative effect on prices and competitiveness.

2.3.3 Impact on marine products

In fisheries, the Magnuson Fishery Conservation and Management Act of 1983 was reauthorised in 1990 with a resulting impact on international fisheries matters. The amended act proposed that the US apply a number of unilateral measures to its partners with which it has Governing International Fisheries Agreements (GIFA) on the high seas. The measures include the right for the US authorities to know the whereabouts of driftnet vessels beyond their exclusive economic zone, to board and inspect those vessels and to have onboard observers.

Amendments require the US Department of Commerce to list nations, the nationals of which engage in largescale driftnet fishing in a manner unacceptable to the US authorities. Such a nation may be certified for the purposes of the so-called “Pelly Amendment” and its marine products may be consequently embargoed.

On July 1, 1992, the US introduced a Compulsory System of Certificates of Origin for yellowfin tuna caught in the Eastern Tropical Pacific. Certification rules are also applied for countries using large-scale trawler nets. These rules may be considered to be a serious obstacle to exporters. The provisions of the High Seas Driftnet Fisheries Enforcement Act of 1992 allow for the possibility of an embargo on any country engaged in large scale driftnet fishing.

Driftnets or drift gillnets are among the simplest and oldest methods of fishing. These nets operate passively by gilling or entangling fish that swim into their mesh. Driftnets are set vertically in the water by means of a buoyant floatline at the top, and a weighted leadline at the bottom, usually at night when the mesh is less visible. Modern driftnets are made of nylon twine which is lighter and less visible than traditional materials such as hemp. Other types of fishing gear commonly used on high seas include the troll line, jig (for squid), purse seine net, long-line and trawl net. There is little to distinguish a fish caught using a driftnet as opposed to another type of fishing gear. However, it has been reported that driftnet caught tuna were generally of poorer market quality than tuna caught with other methods due to marking, predation and soaking prior to retrieval.

2.3.4 US restrictions on agricultural imports

The US has a number of measures that restrict import of agricultural commodities. These restrictions are imposed by the US Customs Service at entry ports on behalf of various government agencies.

2.3.5 Cheese, milk and dairy products

Cheese and cheese products are subject to requirements of Food and Drug Administration (FDA) and the Department of Agriculture (DoA). The import of milk and cream is subject to requirements of the Food, Drugs and Cosmetics Act and the Import Milk Act. These products may be imported only by holders of permits from the Department of Health and Human Services, FDA, Center for Food Safety and Applied Nutrition, Office of Food Labelling, “C” Street, N.W., Washington D.C. 20204; and the DoA.

2.3.6 Fruits, vegetables and nuts

Certain agricultural commodities, including fresh tomatoes, avocados, mangoes, limes, oranges, grapefruit, green peppers, Irish potatoes, cucumbers, eggplants, dry onions, walnuts and filberts, processed dates, prunes, raisins, and olives in tins must meet US import requirements relating to grade, size, quality and maturity. These commodities are inspected and an inspection certificate must be issued by the Food Safety and Inspection Service of the DoA to indicate import compliance.

2.3.7 Insects

Insects in a live state which are injurious to cultivated crops including vegetables, field crops, bush fruit and orchard, forest or shade trees and the eggs, pupae, or larvae of such insects are prohibited for import, except for scientific purposes. All packages containing live insects or their eggs, pupae, or larvae, which are not injurious to crops or trees, are permitted entry into the US only if covered by a permit issued by the Animal and Plant Health Inspection Service of the DoA and are not banned by the US Fish and Wildlife Service.

2.3.8 Livestock and animals

Inspection and quarantine requirements of the Animal and Plant Health Inspection Service must be met for the import of 1) all cloven-hoofed animals such as cattle, sheep, deer, antelope, camels, giraffes; 2) swine inlcuding the various varieties of wild hogs and the meat from such animals; 3) horses, asses, mules and zebras; 4) animal byproducts such as untanned hides, wool, hair, bones, bone meal, blood meal, animal casings, glands, organisms, extracts or secretions of ruminants and swine; 5) animal germplasms including embryos and semen; and 6) hay and straw. An import permit must be obtained from the agency before shipping from the country of origin. In addition, all animal imports must be accompanied by a health certificate.

A special offshore, high security facility, the Harry S.Truman Animal Import Center, has been set up at Key West, Florida, so that livestock can be safely quarantined when imported from countries affected by Foot and Mouth Disease or other serious animal diseases that do not occur in the US.

2.3.9 Plant and plant products

Import of plants and plant products are also subject to DoA regulations. Plants include fruits, vegetables, nursery stock, bulbs, roots, seeds, certain fibres including cotton and broomcorn, cut flowers, sugarcane, certain cereals, elm logs and elm lumber with bark attached.

2.3.10 Poultry and Poultry Products

Poultry, live, dressed, or canned; eggs, including eggs for hatching; and egg products are subject to the requirements and regulations of the Animal and Plant Health Inspection Service and the Food Safety and Inspection Service of the DoA.

2.3.11 Seeds

The import of seeds and vegetables and screenings is governed by the provisions of the Federal Seed Act of 1939 and the regulations of DoA's Agricultural Marketing Service. Shipments are detained pending the drawing and testing of samples.

2.4 India and Japan

2.4.1 Phytosanitary barriers in Japan

The World Trade Organisation (WTO) has opened up a new market for India's burgeoning rice surpluses in Japan. For, one of the world's most protected market, Japan now has to import four per cent of its rice requirements which comes to 400,000 tonnes. And by the year 2000, eight per cent of Japanese market for rice should be opened to imports.

According to Indian rice exporters, our country cannot avail this facility due to the presence of excessive chemical residues in rice. Indian rice samples will have to be cleared by the Overseas Merchandise Inspection Committee of Japan. For, Japan has a stringent standards for permissible limits of pesticides and other chemical residues in food products.

Similarly, there are reports that India's cashew exports too will face the problem of excessive pesticide residues.

According to a study prepared by the US government, Japan does not permit many food additives used widely in the world. For instance, Japan has banned the use of sodium benzoate as a preservative in canned fruit. For phytosanitary reasons, it does not allow entry to numerous fresh fruits and vegetables such as pear, some varieties of cherries, nectarines, tomatoes and potatoes.

In some cases, such as cherries, nectarines and apples, phytosanitary protocols may include only specific limited product varieties. This has occurred despite evidence that treatment that is effective against pests for one variety can easily be extended to new varieties. Under the current system, new varieties must undergo costly and time consuming additional scientific research and testing if they are to be allowed entry under a phytosanitary protocol. Some products like potatoes are banned outright due to Japanese concerns about entry of the golden nematodese and potato wart disease.

2.5 India and European Union

2.5.1 European Union and non-tariff trade barriers

Apart from many quotas that restrict entry of agricultural commodities, European Union has an array of environment-related barriers against agricultural crops.

Take the case of fur. In 1991, EU banned the import of fur from countries where the leghold trap is used together with a simultaneous ban on this product within the community. The EU would allow imports of these products only if the exporting country has "adequate administrative or legislative provisions, in force, to prohibit the use of the leghold trap in its territory" or "the trapping methods used in its territory... meet internationally agreed humane trapping standards."

The EU has banned the use of all hormones, natural and synthetic, in livestock production (except certain hormones when used for therapeutic purposes). It applies to meat and meat products imported into the EU from 1989 and the only exception is for the meat for pet food use. This ban will certainly affect blossoming milk and milk products exports to the EU as growth hormones are used widely in the dairy sector in India.

For exporters of fish and shrimp, the regulation from the European Union (1993) and the directive from the European Council (1991) are important documents of rules concerning the fish hygiene. In this legislative document, detailed criteria are described concerning the water quality for breeding waters, the treatment, packaging, and transport of fish products. Moreover, requirement for the whole production process can be drawn out of these documents. Legislative criteria for fruit and vegetables were established in 1991 about organic cultivation and labelling of agricultural products and food.

2.6 Tea

2.6.1 Problems facing tea export

The Indian tea industry has been facing stormy weather over the past few years. Tea exports had actually collapsed in 1991-92 after the disintegration of the Soviet Union and the recovery thereafter has been painfully slow. Tea exports had earlier been an area where India's exports enjoyed a comparative advantage over other countries. While in 1960 India's share of the world trade in tea was over 37 per cent, it declined to 22 per cent in 1985 and has now plummeted to about 19 per cent.

The last prosperous year for the domestic tea industry was in 1982-83. However, on the export front, the peak figure of 241 million kilograms was attained in 1980-81. The International Tea Committee says that the lowest exports were recorded at 169 million kgs in 1991-92, after the collapse of the Soviet Union. As the single largest buyer of Indian teas, it had accounted for around 57 percent of the total exports in 1991. But its successors bought only 28 per cent in 1993. Russia cut down purchases from 100,000 tonnes in 1992 to 38,000 tonnes in 1994.

India still leads the world in gross tea production, accounting for around 30 per cent. India annually exports about 190 million kgs of some of the best tea in the world. Sri Lanka comes second, but is slowly gaining ground. Competition is also hotting up from other countries such as Japan, Indonesia and China.

2.6.2 Tea growers forced to think green

In May 1995, Germany banned imports of tea from India because it claimed the product has high level of pesticides. Coffee and other plantation crops were also included in this list.

Buckling under pressure from Germany, Indian tea planters have assured visiting representatives of the German Tea Association that all attempts would be made to reduce pesticide residue levels in Indian tea to meet German standards. In return the association has promised to plead India's case with its government so that German standards are not strictly enforced immediately. It has also offered to fund research in India on reduction of pesticide load in tea.

The rejection in January, 1995 of a consignment of Darjeeling tea by Germany on the grounds of excessive pesticide residues had raised fears that Indian tea could be boycotted, with a little help from the European Union's tea lobby.

The German Tea Association had cautioned the Darjeeling Planter's Association and the Tea Board of India in November 1993: "The German legislation regarding pesticides having a kind of pilot function within the (European) Common market, in the not too distant future....tetradifon (a pesticide) will be treated in the same way in all European member states." It also warned of "serious difficulties, which could result in a major loss of turnover for the Indian tea trade."

On the other side of the German threat is the fact that the German limit of 0.01 milligrams of tetradifon and 2 mg of ethion per kg of tea has been somewhat arbitrarily imposed in 1995 following lack of data from India on its pesticide safety limits on tea. Germany has requested India to supply this information from April 1994. But, as a leading tea broking firm put it, "India hasn't bothered to take any action and Germany seems to have decided to shock the country's tea industry by rejecting some Darjeeling tea."

The Teekanne Darjeeling Gold brand of tea was rejected because it contained 0.24 mg of tetradifon per kg of tea - 24 times the limit set by Germany. Germany soon followed it up with a report by its Institute of Environment Analytics, Messzelle denouncing the brand as unsafe.

The German rejection follows half a decade of repeated exhortations to India to reduce its tea pesticide residues. The United Kingdom, another large European importer of Indian tea, has been softpedalling the issue, possibly because many tea companies in India are British owned.

So far, India's retort to Germany has been that it adheres to the maximum residue levels of recommended pesticides established by the US Environmental Protection Agency (EPA).

The ban had, however, come as a surprise because, contrary to tea from other major tea producing countries that has been rejected on occasions, Indian tea had been considered safe. At the moment, Germany whose share in Indian tea imports grew rapidly after the collapse of the Soviet Union has the upper hand and can influence the European community. India can no longer afford to turn a deaf ear to its objections, simply because Germany is now the highest paying customer for top quality Indian teas.

While tea planters privately admit that the levels of chemical pesticides and fertilizers are very high, there has been no systematic study so far. Excessive doses of chemicals can destroy soil fertility, kill natural predators of tea pests, infect water bodies, poison livestock and harm the workers spraying the chemicals.

Besides any indepth scientific analysis of Indian tea entering Germany is prohibitively expensive. It costs roughly $234 per analysis. The German Tea Association has, therefore, suggested that the Tea Board of India should guarantee to license the export of only that tea which complies with German regulations or that India should split with Germany the cost of analysis. Germany has even offered to help develop technical facilities in India to test residues.

2.6.3 Response from the tea industry

The Tea Board has entrusted TRA, the Coonoor-based United Planters Association of South India (UPASI) and the Council for Scientific and Industrial Research at Palampur with sampling pesticide residues and advising tea gardens on the reduction of pesticides. These organisations have started compiling data on the residues of some important pesticides used in tea - growing areas in the northeast, south India and the Kangra valley in Himachal Pradesh - pesticides that combat pests like the red spider, scarlet mite, jassid or green fly, thrips and caterpillars, and the pathogens: red rust and blister blight.

In a series of seminars and training programmes held for the benefit of tea estate staff, UPASI and TRA have circulated lists of chemical pesticides that are banned, including dichlorodiphenyltrichloroethane (DDT), benzene hexachloride, Aldrine, Aidrex, Endrin and tetradifon. TRA however says that Germany itself cleared most of the chemicals - like ethion, kelthane and cypermethrin - that are now causing it so much concern.

Chemical residues can be avoided if spraying is completed before the start of the main plucking season March-April or by discarding the first round of leaves if the chemicals are sprayed during the plucking season.

The use of chemical pesticides can be greatly reduced if they are applied in combination with biocontrol measures. TRA recommends the application of bio agents like trichoderma, a fungal antagonist, to protect cuts inflicted on the bush during pruning, the use of neem - based pesticides along with chemical pesticides, monitoring pests and diseases to check their spread in the initial stage itself, improving drainage systems, removing weeds, and soil - stirring in winter to reduce the incidence of termites, caterpillars and other pests. Nitrogen-fixing legumes such as mimosa should be grown, and cowdung, mulch and vermiculture should be used to re-fertilise the soil. TRA has also suggested spraying pruned tea bushes with an alkaline mixture to discourage pests and diseases.

But the yield, according to experts, declines by as much as 40 per cent when chemical pesticides are discontinued. However, the loss is offset by the higher price organic tea commands in the international market. While the export price of Darjeeling tea produced with chemical fertilisers is Rs. 90-95 per kg, the average price of organically-produced Darjeeling tea is Rs. 155 per kg.

2.7 Recommendations

The agro exports industry has a lot to do to realise its full potential. Concerns of importing countries relate mainly to health hazards posed by increasing use of fertiliser as well as general impact of modern agricultural practices on the environment. Exporters should take the lead along with agricultural scientists and policy makers to tackle the problem at the root. That is educating the growers to use the right amount of fertilisers and pesticides, ensure that post harvest handling methods are in line with those practised in developed countries.

References:

1. A Guidebook on " Environmental product standards in Western Europe, the US and Japan", Graham Bennett and Barbara Verhoeve, Institute for European Environmental Policy, Jansbuitensingel 14, 6811 AB Arnhem, The Netherlands.
2. 1994 Report on US barriers to trade and investment, published by the Services of the European Commission, Brussels.
3. 1994 National Trade Estimate on Foreign Trade Barriers, Office of the United States Trade Representative, Executive Office of the President, Washington, D.C. 20506
4. Environmental Labelling schemes and ecological product standards for Indonesian exports, by Harald Neitzel and Ute Landmann, PEM Planungs-engineering-Management GMBH, Dusseldorf, Germany
5. The Emperor's New Clothes, United Nations Conference on Trade and Development, United Nations Development Programme, Geneva.
6. Toward an Ecological Injection into International Trade, by Brie Lalonde, Eco-Developpment, 3 rue Roquepine 75 008 Paris, France.

CHAPTER-III: LEATHER

3.1 Background

Long before the World Trade Organisation (WTO) came into existence, to rewrite the rules of international trade, environmental issues had come to the fore at least in the leather sector. An Indian leather exporter got a shock of his life when a major German buyer rejected his export consignment. Reason: the leather goods contained pentachlorophenol (PCP), a toxic chemical used widely as a preservative of leather and wood. The German government's new regulation had virtually banned the use of this chemical in leather goods.

The German government's restriction on PCP, a chemical also used as a fungicide and bactericide, was not a hastily announced decision. The decision to ban PCP was taken in early 1987. However, due to stiff opposition from other European countries, it was not notified immediately. But after the wide publication of a number of scientific reports on the health hazards of PCP released from furniture wood panels and other structures preserved by this chemical, the government decided to act.

The ban was not particulary directed against leather goods but it was one of the most affected sector. To lessen the impact of this drastic measure, a maximum limit of 5 ppm or 5 mg/kg presence of PCP in leather goods was prescribed. Though stunned initially, major leather exporters to Germany such as India and Brazil, recovered quickly to encourage use of alternatives to PCP. There are many other such chemicals used by the leather industry facing a similar ban. Benzidine dyes and formaldehyde top the list.

Moreover, formulation of an ecolabelling scheme in Germany and in other European Union member states make other demands on the industry such as environment-friendly manufacturing methods. For instance, a new German prescription states that emissions of chromium during manufacturing of shoes should not exceed 120 mg per pair of shoes. Volatile organic (VO) compounds should be avoided. If not possible, the VO emissions should not exceed 150 mg per cubic meter. The cradle-to-grave environment-friendliness of leather products is the ultimate aim. The following sections discuss the various environmental issues which are coming in the way of Indian leather exporters.

3.2 India's leather industry

3.2.1 Leather industry's export performance

Leather and leather products such as shoes, garments and leather good are among India's fastest growing export items. India's leather exports including finished leather goods in 1993-94 was $ 1,320 million or Rs 4,414 crore. Out of this, finished leather goods accounted for $ 245 milion or Rs 733 crore., according to the India Trade Promotion Organisation, New Delhi. A target to export Rs 5,000 crore of leather and leather products has been set for 1994-95.

This achievement is commendable considering the fact that India's leather exports was almost negligible till the early 1980s. It took off at this stage and increased by 9.1 times between 1981 and 1991. In 1991-92, leather exports increased by another 20 per cent to touch Rs 3,128 crore. Leather exports accounted for seven per cent of total national exports.

3.2.2 Importance of German market

Germany is the largest single export market for India's leather exports, according to a study by the German Development Institute. For instance, in 1987-88, the then West Germany accounted for 18.4 per cent of India's leather exports and East Germany another 4 per cent. Russia (then Soviet Union) had a share of 17 per cent of the country's leather exports and the US 12.3 per cent. In 1990-91, unified Germany accounted for 20 per cent of India's leather exports.

3.2.3 Other potential markets

Indian exporters have now set their eyes on cornering a slice of the $ 37-billion (Rs 118,400 crore) US leather market. Indian products received good response from buyers at the four-day exposition "Magic Show" in February, 1995 at Las Vegas, which played host to more than 2200 manufacturers featuring more than 5,000 major brands with designer and private labels from major countries.

The Council for Leather Exports (CLE), the government-aided body promoting Indian leather goods exports, has been making a sustained effort to find a niche in the US, the world's biggest market for leather products.

According to a study by a US consultant Mckinsey, the exports of Indian leather products (including accessories, garments and footwear) to the US, will touch Rs 2,240 crore ($700 million) in 1997. This would involve incremental exports worth Rs 1,680 crore ($525 million). Of the total exports, leather garments would constitute 13 per cent and leather accessories, including handbags, small accessories, gloves and luggage, would form 17 per cent.

3.2.4 Profile of the leather industry

Indian leather industry has a heterogeneous structure. Traditionally, leather processing was done by a vast network of cottage industries. Footwear accounted for majority of leather consumption. But for two or three large shoe factories, the small scale sector produced most of the shoes. Till early 1970s, India exported mainly raw hides and skins. In 1973, pickled and semi-finished leather accounted for 83 per cent of India's total leather exports, a joint government of India-United Naitons Development Programme report said.

The leather industry employs about 1.4 million people. There are about 2,000 tanneries with six states accounting for majority of them. Tamil Nadu has 520 tanneries, followed by West Bengal (400), Uttar Pradesh (200 with 150 of them in Kanpur city itself), Maharashtra (200), Karnataka (180) and Rajasthan (150). About 75 per cent of these tanneries are in the small-scale and cottage sector. Large tanneries account for less than five per cent of the total, according to the Central Pollution Control Board. About 10 per cent of the small tanneries are not registered with any government agency.

According to a 1992 report by the National Leather Development Programme, out of the 179 million pairs of shoes and shoe uppers produced in that year, 40 million were manufactured by the cottage sector, 75 million in small scale units and 60 million in medium and large-scale factories. The production capacity of finished leather goods by the small scale sector is four times that of medium and large scale units. The small scale sector has a near monopoly in the production of industrial gloves, saddlery, and harness and leather accessories.

3.3 Environmental impediments to Indian leather exports

3.3.1 Germany leads in environmental regulations

Germany fired the first salvo in the environmentalists' battle against the toxic PCP by enforcing its ban in 1990. This was after enough evidence was available about its presence in leather-covered furniture and leather clothing. PCP can cause cancer, liver damage and allergies such as asthma. Germany also identified other leather-induced dangers caused by the use of formaldehyde and cancer-causing dyes (azo and benzidine).

3.3.2 Ban on pentachlorophenol (PCP)

PCP became an issue in Germany after a number of mysterious illnesses were traced to PCP-contaminated air in houses with a high content of wood structures treated with this chemical. In fact, many such houses had to be abandoned by their inhabitants to avoid the ill effects of PCP. So a ban on this chemical was imposed with maximum limits (5 mg/kg) prescribed for indirectly-treated PCP products. Sweden had banned PCP use in 1977 itself. Not only Germany, its European counterparts such as the Netherlands, Denmark and Switzerland also demanded the same high standards for the use of this chemical. However, only the German government has been firm in enforcing the standards.

According to a report by the German Development Institute, the European Community standard for PCP is a high 1000 ppm or 10 mg per kg. Italy and France are strongly opposed to the ban. Perhaps because France is one of the major producers of PCP while Italy has a big leather industry.

On the other hand, strict environmental laws and regulations led to the decline of Germany's domestic leather industry. Of course, only the production was phased out and she has been resorting to large scale imports.

After the imposition of the ban, German authorities have tested leather goods for their PCP content on many occasions. Every time the tests revealed higher than prescribed PCP limits. Italy, France, Greece and India protested to the German government and asked for lifting of the ban but in vain.

3.3.3 Alternatives to PCP

Many alternatives to PCP exists. These are: Thiocyanatomethylthio-benzothiazole (TCMTB), P-chloro-m-cresol (PCMC), and O-phenylphenon (OPP). However, the most widely used substitute is Busan 30 which mainly consists of the chemical TCMTB. Busan 30 costs seven times more than PCP. While PCP was manufactured locally, India has to import Busan 30. Most of the tanneries have now switched over to Busan 30 imported either from Germany or the US. India too has banned the production and use of PCP in 1992.

3.3.4 Research on PCP substitutes

The Council for Leather Exports (CLE) under the ministry of commerce and the Central Leather Research Institute (CLRI) of the Council of Scientific and Industrial Research have identified TCMTB and PCMC as effective substitutes for PCP. The use of these substances are acceptable to German authorities.

Indian government has reduced the import duty on these chemicals from 150 per cent to 50 per cent. Besides, leather producers were told how to distinguish between long and short- term measures. In addition, industry has been advised to avoid use of all chlorinated compounds which are basically unfriendly to the environment. The CLRI has recently developed a technology to produce TCMTB which in turn will help in manufacturing BU 30.

3.3.5 Benzidine dyes

Soon benzidine dyes will also become a restricted item in leather imports into Germany. Production and use of benzidine dye is already restricted in Germany and some other European countries. Under German workers' regulations, benzidine-containing dyes should not be used. Some German buyers have already started to insist on benzidine-free leather imports. This may soon become the norm.

A standardised testing method to detect the presence of benzidine dye in leather is yet to be ready.

Substitutes to this dye are now available abroad and in India. The substitutes are more expensive and as such due to the absence of its ban, Indian manufacturers continue to use this toxic dye. However, there are reports that some tanners have replaced the dyes.

3.4. Ecolabelling for leather products

3.4.1 European Community's ecolabelling scheme

The Netherlands is the coordinator of the ecolabelling scheme for footwear in the European Union.

The preliminary ecolabelling proposal mentions footwear "made out of leather, rubber, EVA, nylon, polyester, and cotton provided their combined share in the total weight of the shoe is at least 90 per cent".

The labelling criteria and parameters cover five phases of the life-cycle of the product:

- Acquisition of raw materials
- Production of materials
- Product fabrication
- Product use, and
- Waste-processing.

Environmental aspects considered for each of the phases in the life-cycle of the product cover the use of raw materials (renewable and non-renewable), energy consumption (including non-renewable), discharges and emission, wastes, various forms of nuisance (health and environmental hazards), reuse of products and parts there of (including through recycling), and repairability and durability of the product.

The criteria and parameters defined on the basis of these concerns focus particularly on the production of leather footwear.

Raw Materials:

1. Energy content not more than 95 millijoules per pair (60 for children's footwear)
2. Constraints on the use of chemicals and dyestuffs in processing of raw materials:
   a. emissions of chrome should be less than 120 mg/pair
   b. PCP content in the leather should not exceed 100 ppm
   c. treatment of leather with water-based materials only and no VOs (volatile organic compounds)

      If VOs are used, it should not be greater than 150 mg /cubic metre
   d. during the leather tanning process, waste water should be disposed off in a biological water purification installation
   e. contaminated chrome waste should be recycled unless the chrome waste is not discharged or recylced as chemical waste in the country where the waste originates.

Then there are many quality and performance requirements:

- A lengthy list of requirements for the various components in footwear, all with defined parameters and testing methods, with specified checking procedures.

  These requirments cover, among other matters, resistance to splitting, sweat rubbing and abrasion, water, repeated bending, dry and wet, and are specific for upper leather, inner leather, insole leather, non-leather, insole materials, rubber and synthetic sole materials.
- Average energy content: For all materials that could be used in the production of footwear eligible for the ecolabel, this establishes an energy content grid which includes the energy content of the raw material plus that of the processing.

3.4.2 Restrictive legislations in Germany

Germany has enacted many legislations that affect the leather industry. The water conservation law (wasserhaushaltsgesetz) sets standards for the quality of tannery effluents. A special law (Abwasserabgaben-Gesetz) imposes levies on sewage water according to the grade of pollution. The use or disposal of sludge is regulated by a special sludge regulation (Klarschlammverordnung).

Workers in tanneries are protected against undue health risks from chemicals by a special law (Gesetz uber gesundheitsschadliche und feuergefahrliche Arbeitsstoffe) and another regulation on the maximum atmospheric concentration of chemicals at the workplace (MAK = Maximale Arbeitsplatz-Konzentration). These legal requirements can only be met with modern equipment for sewage treatment and monitoring of the chemical composition of the atmosphere in the tanneries.

With the increasing competition from developing countries, the potential for recovering the environmental costs through higher prices for leather producers was rather limited, and only high quality tanneries could

afford the additional investment. The others had to close down. Especially the tanneries in the former GDR, which had to comply with the federal environmental regulation after the unification of Germany, lack the financial capacity to invest in modern effluent treatment plants and other environmental protection technologies.

3.4.3 Exporting environmental concerns abroad

In the next stage, these strong regulations that govern the leather industry are sought to be insisted upon the manufacturers who export leather products to Germany. This is because more and more Germans have started to ask whether the shifting of environmentally harmful industries and production activities to developing countries could be justified from a global perspective.

This growing concern will soon lead to German and other European consumers demanding the same high-environmental standards in the production of leather goods they import. So far the ecolabelling schemes are voluntary. But soon the leather industry in India will have to comply with it, especially the European standards, if it has to hold on to its existing foreign markets.

What are these new demands that may be forced on the industry?

3.4.4 Pollution from production processes

Water pollution is a major problem caused by the leather industry. Effluent pollution is largely due to activities in the beamhouse, where hides and skins are prepared for tanning, and to wet work after tanning. Besides the high level of water consumption (between 25 and 80 cu.m per tonne), there is the problem of dissolved chemicals that either settle in the sewage sludge or, in the absence of adequate treatment facilities, flow away.

According to a report on Indian leather industry prepared by the German Development Institute, chlorides, tannins, chrome salts, nitrogen sulphates, sulphides, inorganic trace elements and solvents are among the harmful chemicals most commonly found in the water. Pollution is also caused by organic substances (dirt, blood, protein residues, dung) and the dehairing of hides and skins.

There are several other problem areas in the manufacturing process. It starts with the soaking or curing process, where salt is used to preserve the raw material. When this salt is discharged, it leads to salinity.

Another chemical specially targeted is the environmentally-dangerous chromium, which is used extensively in the process. 40 to 60 per cent of the chromium is fixed to the material but the remainder is discharged as effluent. Chrome salts are used at several stages in leather making during dyeing and post-tanning operations. Recovery of chromium is important because the chemical is expensive. Secondly, this toxic metal can enter human body through the food chain and cause severe damages. Chromium VI is considered to be carcinogenic and cause allergies such as asthma. There are also indications that Chromium III used in the leather industry chemically changes into the more toxic Chromium VI.

Another contentious issue is the use of sulphides in the liming process for the removal of hair and other unwanted proteinous matter. Sulphides increase the biological and chemical oxygen demands in the effluent. The CLRI has developed an enzyme, clarizyme, which ensures that optimum levels of sulphides are used in the process - down from the present 3-4 per cent of the weight of the skins to 2 per cent or less.

In addition, untreated effluents, liquid chemicals and contaminated sewage sludge can pollute the ground water. Another problem is the discharge of tannery effluents on to surrounding fields. Case studies in India show that yields from such lands have declined by nearly two-third. In some areas all cultivable land is so contaminated that it can no longer be farmed. The polluted water causes a wide range of diseases, including skin diseases, gastrointestinal diseases, disturbed body growth, heart diseases and asthma.

Dyeing, lubricating and post-tanning operations also contaminate the effluents to a large extent. The lubricants are not completely absorbed by the leather; their biological and chemical decomposition requires large quantities of oxygen. In post-tanning stage a number of liquids containing chromium or salts are used extensively. These flow into the effluent and consume large quantities of oxygen.

After the drying stage, finishing and cleaning again consume large quantities of water. For ecological reasons the use of solvents containing formaldehyde is becoming increasingly uncommon. Problems are caused by the inorganic and organic pigments in dyes, which have a strong dyeing effect even in small concentrations. As these are finely dispersed, their removal from dirty water becomes difficult.

3.4.5 Air pollution

Besides the unpleasant odours from leather, air pollution also arise from the emissions during the soaking, dehairing, pickling and finishing operations. The incineration process of solid wastes also pollutes the air.

Strong odours pervade the atmosphere when skins and hides decompose in the rawhide store. Also when non-isolated ferments are used in the beamhouse. This can be avoided by more careful monitoring of the processes and satisfactory maintenance of machinery and buildings.The soaking and dehairing operations release ammonia and traces of hydrogen sulphide gas which are created when sulphides and acids come into contact.

This hazard is again posed by the pickle solution, which consists of salt and acid, and releases the last remaining sulphides in the dehaired hide and form hydrogen sulphide. At a concentration of over 70 ppm hydrogen sulphide causes irritation. When the concentration ranges between 500 and 800 ppm death occurs within 30 minutes.

Then there is pressure to phase out the use of ammonium chloride for the de-liming process. Ammonium chloride increases nitrogen levels in the air and water. It also causes respiratory problems for humans and increase water toxicity through enhanced nitrification.

3.4.6 Solid wastes

The leather-making process generates large amounts of solid wastes such as rawhide trimmings, tanned leather trimmings, wool, hair, dehaired hide cuttings, shavings and finished leather trimmings occur. Hair can be reused and rawhide trimmings processed to size. Tanned trimmings are used to make leather fibre fabrics. Leather dust originated by shaving is usually precipitated in the wet state and disposed off as solid waste. Leather dust is dangerous, because it occurs during the buffing of the leather surface and contains tanning and finishing chemicals in particularly high concentrations. Leather dust has been registered by the EC Commission as a potentially carcinogenic substance.

Residues of all toxic chemicals used during the leather processing stage are found in the sewage sludge let out from tanneries. The sewage sludge contaminated by chromium cannot be recommended for re-use in agriculture. The toxic sludge then has to be incinerated. But incineration generates sulphur dioxide and then oxidises Chromium III to carcinogenic Chromium VI. To avoid this, the chromium-contaminated ash has to be treated again before disposal.

3.5 Response strategies

3.5.1 How does the industry respond

Pressure from major importers like the US, Germany, France, Italy and the UK to adopt green technologies is compelling the reluctant industry to clean up its act. The CLE says that they have to adjust and eliminate or reduce the use of certain chemicals which are found to be environmentally harmful.

According to the CLRI, chemicals used in the process vary in range and quality. They come from several sources and there are no fixed parameters for input chemicals. The regulations are needed to precisely spell out the constituents for leather chemicals.

Compared to the unorganised sector, the organised medium and large scale units have little difficulty in complying with the new requirements. They have long-term relation to Western markets, modern technologies and better access to new technologies. Moreover, their financial situation and their experience in dealing with international markets facilitate either the adjustment or the switching over to other markets with lower standards. However, the Indian preference for small scale industries and decentralization has hindered in the past the growth of modern fully integrated leather factories.

The PCP ban confronted the leather sector with three main problems: lack of information, lack of testing facilities and lack of substitutes.

Lack of information: Although the information about the PCP ban had spread early but many tanners and manufacturers had not taken it seriously. They were not convinced that PCP causes harm to the health and therefore hesitated to react, especially, because other major export markets still allowed the use of PCP. Many of them had already produced PCP-containing leather and leather goods for export on stock. They had to sell the stock at lower prices on the domestic market.

Lack of testing facilities: Three groups have been identified who have slightly different problems with PCP-checks: Manufacturers, manufacturers with integrated tanneries and tanners without integrated manufacturing.

Manufacturers who do not have their own tanneries find it difficult to control the use of PCP by their tanners. Either they have to demand a certificate from the tanners that PCP had not been used or they have to have the leather checked by a laboratory. Cautious companies even check certified leather again. Manufacturers with integrated tanneries can implement and control the use of substitutes themselves and are therefore in the best position. Tanners are forced to check their raw materials carefully, especially when they buy hides and skins from collection centres where dead animals are delivered often with a delay of many hours. Within a few hours the damage to the skin by fungal/bacterial attack can be severe. Strong preservatives are necessary to stop degradation which begins once the animal dies, so that collection centres and slaughterhouses can be tempted to use PCP which is more effective than its substitutes. Therefore some tanners send their own preservatives to their suppliers of raw materials to ensure the use of PCP-free chemicals.

In case of imported inputs control is complicated. Imported hides and skins are coming mostly in pickled or wet blue stage from Australia and New Zealand where the use of PCP is not prohibited. Consequently, the hides and skins are likely to contain PCP and have to be checked in India to avoid any risk.

Some tanners even send their chemicals - domestic as well as foreign products - to laboratories, because they suspect domestic and German chemical companies still supply chemicals containing PCP.

In 1989, there were only a few testing facilities. The only government-recognised laboratory to test PCP was

the Central Leather Research Institute (CLRI) in Madras. A large private service company with eight laboratories all over India offers various tests including PCP-checks at comparatively high prices. Since this company has a good reputation many customers in Germany prefer its certificate to the CLRI certificate.

3.5.2 Infrastructure facilities

This section focuses on the tanning effluents only, because they are the major source of pollution. However, research is also under way to reduce air pollution and to recycle other waste. Particularly the "Indo-Dutch Environmental and Sanitary Engineering Project" in Kanpur-Mirzapur under the Ganga action plan is developing new possibilities to reduce pollution and occupational health hazards with the help of both "end-of-pipe" and "clean" technology which aim at chrome-recovery and reuse, process optimization, producing glue and/or briquettes of organic waste etc.

Effluent treatment arrangements have become a statutory and social obligation for the leather industry in India in order to improve the general hygienic conditions for the population living close to tanning areas. Existing tanneries face stricter demands to implement treatment arrangements, new tanneries only obtain a licence in case they treat effluents.

In 1990 the CLRI in Madras carried out a survey on the tanning activities all over the India. The study differentiated between small-scale industries and medium and large scale industries registered with the Directorate General of Technical Development under the Ministry of Industry. The study covered 436 of 1008 SSI units and 66 of 75 DGTD units. Its results about effluent treatment were revealing:

• All over India, 22 per cent of the tanneries surveyed in the SSI sector treat effluents before disposal, whereas the degree and the type of treatment varied considerably; in most of the units treatment meant that the effluents are at best passed through sedimentation tanks for settlement of solids. In many cases effluents overflow and spread into open areas where they become a threat to groundwater and soil. There were huge differences between the various tanning areas as well: in Calcutta, only 1 per cent of units have treatment arrangements.

• About 59 per cent of the DGTD units surveyed have treatment arrangements; they also vary as in the case of the SSI units. The tanners interviewed mentioned the following main bottlenecks connected with the installation of treatment plants:

- lack of adequate finance (investment + running cost),
- lack of suitable treatment technology,
- lack of adequate land and
- disposal of solid sludge.

Nearly 79 per cent of the SSI units support the idea of establishing Common Effluent Treatment Plants (CETP); among the DGTD units 61 per cent were in favour of a CETP. Thus, it was evident that most of the tanners were aware of the need to set up treatment arrangements. They also agreed on sharing the burden with the government.

The results of the Indo-Dutch project are very promising. Up to now 5 tanneries have got their own chromium recovery plant. The project (in association with CLRI) provides services and consulting on how to implement chromium recovery plants. Implementation is relatively simple, only some questions in terms of design and capacity must be tackled individually for each tannery. Thereby, tanners can reduce costs for the expensive chromium on one hand and solve the very delicate problem of the disposal of chrome-loaded sludge on the other (which is mandatory from the side of the Central and state pollution control boards).

3.6 Global footwear markets

The making of footwear is a relatively straight forward operation and inevitably attracts considerable interest from low labour cost countries like India. From 1978 to 1990, there was a significant shift of shoemaking on a global scale from developed to developing countries. For example, in 1978 developed countries accounted for around 24 per cent of world shoe making and developing countries 53 per cent, but by 1990, that share had changed to 18 and 69 percent respectively. The main benefactor of this shift has been Asia which has increased its share of world shoemaking from around 40 per cent to 60 per cent over that time, while Eastern Europe, the former Soviet Union, Western Europe and North America have seen their combined share reduced from 47 per cent to 31 per cent.

The major shares over this period have increased in two groups of countries. Brazil, China, the Republic of Korea and Taiwan have all registered increases of over 100 million pairs, while Italy, Portugal, Thailand and Yogoslavia have all experienced increases of over 50 million pairs each. There have also been several intra-regional movements. For example, production in Europe has shifted from north to south and in east Asia, from the Republic of Korea and Taiwan to China, Indonesia, Thailand and Vietnam, with Malaysia and the Philippnes also making their presence felt. At the other end of the scale, the United States has seen its share of shoe making decrease by over 200 million pairs during that period and France, Germany and the United Kingdom have also registered significant decreases. Footwear production in Belgium, Denmark, Ireland and Sweden has virtually ceased. China is now the leading producer, with 2700 million pairs, followed by the former Soviet Union, with 820 million pairs, although Asia as a region continues to dominate world shoe production.

On the consumption side, Europe, the former Soviet Union and North and Central America are the major consuming regions, while Asia and Western Asia are minor consuming regions. In terms of per capita consumption of shoes, the highest levels can be found in Western Europe and North America.

3.7 Recommendations

The global market trends clearly indicate that the prospect of expanding production in leather and leather goods industries is very bright. Both the tanning and shoemaking industries have tended to gravitate towards low labour cost producers, as confirmed by the enormous upsurge of shoemaking in China.

The emerging links between trade and the environment warrants closer examination in India concerning the status of various leather production technologies and their relative impact on the environment. Industrial growth and successful international trade will play a crucial role in development efforts, but only if these opportunities are combined with a judicious mix of technology and environmental policies.

References:

1. Market Study on Leather goods: A practical guide for exporters in developing countries, International Trade Centre UNCTAD/GATT, Geneva
2. 1994 National Trade Estimate Report on Foreign Trade Barriers, United States Trade Representative, Executive office of the President, Washington, D.C. 20506
3. A guide book on "Environmental product standards in Western Europe, the US and Japan", Graham Benett and Barbara Verhoeve, Institute for European Environmental Policy, Jansbuitensingel 14, 6811 AB Arnhem, The Netherlands.
4. Ecolabelling schemes in the European Union and their impacts on Brazilian exports by Pedro d' Motta Veiga.
5. Towards an ecological injection into international trade, by Brie Lalonde, Eco-developpment, 3 rue Roquepine 75 008 Paris, France.
6. Tata Services Ltd 1992 report.
7. Ecological Product Standards and Requirements as a New challenge for Developing Countries Industries and Exports, German Development Institute, Hallerstrasse3, D-10598 Berlin, Germany.

CHAPTER-IV: TEXTILES AND CLOTHING

4.1 Background

Textile and clothing industry commands a key economic position not only in India but also in the entire world. It is a major foreign exchange earner for India. Presently, textile exports constitute 25 per cent of overall exports. Therefore, it is under close scrutiny.

In fact, commodity-wise data on India's exports and imports between April and November 1994 shows that the largest category of Indian exports - textiles - has grown at a pace which was well above the average and hence increased its share in total exports to almost a quarter.

As per GATT statistics, the world trade in garments increased in absolute terms between 1970-80 by 177 percent or an average annual rate of 18.6 per cent. India's performance was comparatively better at 224 per cent or an annual rate of 22.72 percent. Yet India's share in the world trade is below 2.5 per cent.

The country exported textiles worth Rs. 12,195 crores ($3,811 million) in April-November 1994 against Rs. 10,112 crores ($3,160 million) in the previous year, achieving a 26.4 per cent growth in a period in which the overall growth rate was just 15.3 per cent. The growth was particularly sharp (41.6 per cent) in the cotton, yarn, fabrics, made-ups etc category.

Garments exports in 1993-94 were worth Rs. 11,925 crores ($3726.8 million). This was even more than the target of Rs. 10,960 crores ($3425 million) set for 1994-95. Exports for 1993-94 at Rs. 11,924 crores ($3726.4 million) were 25 per cent more than the target of $2978 million.

4.2 Environmental consciousness vs textile exports

Although Indian textiles exports have established a phenomenal growth over the past couple of years, there are widespread fears that it may face stumbling blocks due to the growing environmental concerns in the developed countries.

Two decades ago, it was infradig for the urban sophisticates to sport anything but synthetics. But today, the scene is vastly different.The environmentally conscious West is now looking for the eco-friendly variety of textiles. The impetus is likely to come from exports of bio-degradable produce.

For, awareness about ecofriendly textiles is catching on internationally. In fact, eco-standards relating to production and processing are new issues in the North-South relations. In industrialised countries these are gaining ground as an instrument of environmental policy. These changing standards will affect developing countries as their exports have to comply with higher eco-standards of developed countries.

For one, the chemicals used in manufacturing textiles have come under close scrutiny. The German textile industry has identified more than 8000 chemicals regularly used in the production and processing of textiles. Though the impact of these chemicals has not been sufficiently investigated, the textile industry has voluntarily started advocating eco-labels on textile products to enable consumers to buy "clean" products.

4.2.1 Eco-friendly textiles

As a result of the heightened public awareness of eco-damages from textiles and textile finishing, there is a growing market share for "eco-textiles" (which claim to be produced with "clean cotton", i.e. cotton with low content of harmful chemicals). Even large department stores and mail order houses venture into eco-textiles and find a rising demand for them. Parallel to the rising share of eco-textiles, there is a trend both in legislation and on the industry level to introduce stricter eco-requirements for textiles.

But the cost of eco-friendly textiles is slightly higher than the ordinary ones because right from cultivation level it demands greater care. Although the precise definition of eco-friendly textiles is yet to be standardised, it is generally accepted that if the biodegradability of effluents is about 90 per cent, the product is eco-friendly.

India, on its part, cannot afford to neglect the upcoming environmental legislations and restrictions prevailing in the importing countries, even though the majority of Indian textile industry is still oriented towards the large domestic market. The Indian textile industry is still characterised by powerloom, handloom and mill sectors. The decentralised sector is growing at a steady pace, producing about 60 per cent of the total production. Manufacturers of garments and textiles, which are traditionally directing about 15 per cent of Indian exports to Germany, have convincingly demonstrated their ability to compete with the best in the world.

4.2.1 Eco-labelling

Two eco-labels were introduced in Germany in 1993. Markenzeichen Schastoffgeprufth Textilien (MST), a label introduced by German textile industry which sets norms for consumer goods and indicates a lower content of pollutants. The second is Markenzeichen Unweltschonende Textilien (MUT), a label which sets norms for production processes. All processing conditions are analysed with reference to the degree of

pollution of air, water and soil.

There are other national and private labels being developed in Europe. The Ostereichisches Textil-Forschungsinstitut has developed the OEKOTEX label which relates to both raw material and final product. The ECO-TEX is a privately registered trade mark for an eco-label and is awarded on the basis of a factory audit. The European Largest Textile and Apparel Companies (ELTAC) has also undertaken an eco-label initiative.

With the proliferation of eco-labelling schemes, the Coordination Committee for the Textile Industries in the EEC (COMITEXTIL), which supports a single European label, prepared a comparative document in mid-1993 to rationalize the issue. Eco-labels can be differentiated according to the way they deal with the following items: raw materials, product characteristics, and processing characteristics.

4.2.3 Indian Government's role in coping up with the situation

A Technical Committee on Ecomark headed by the Chairman, Central Pollution Control Board, has been set up by the ministry of environment and forests (MEF). To ensure safety on the use of synthetic fibres and their blends with other textiles or fabrics, the committee has prescribed a requirement for dermatological safety, among other things. The aspects, that are given due consideration for developing the ecomark for a product are: pollution potential, recyclability and contribution for saving non-renewable resources.

Considering all the developments in the importing countries, this committee is also developing its own ecolabel standards in three different categories:

1. Cotton, wool and manmade fibres
2. Silk and silk products
3. Jute and jute products

4.2.4 Most important ecological and health problems of the textile industry

What was once considered a safe crop, cotton has now come under intense attack of environmentalists. The most serious ecological problems occur during cotton growing and textile finishing. Cotton is now considered to be an Environmental Nightmare (Schneider,1993). Cotton is one of the most chemical intensive crops affecting both soil and ground water. This has done serious damage to the environment: the growing of cotton as a single crop and the increase in irrigation and in the use of fertilizers and pesticides have leached, salinized and eroded the soil, polluted lakes and rivers or overused them.

The spraying of pesticides also affects the health of cotton pickers. Pesticide residues have been found in raw cotton and cotton clothing (Cetinkaya/ Schenek,1986, Pfitzenmaier,1990) and Oeko-Test (5/ 1992). Traditional cotton cultivation contaminates the soils to such an extent that cotton certified as organic has to be grown in fields where no traditional cotton growing has taken place for three years (Schneider,1993). This will be reflected in textile eco-labels sooner or later. They will be given only to textiles which have been made from organic cotton and processed without harmful chemicals.

It is evident from these problems that a complete change to natural fibres would be ecologically safe only if growing conditions were simultaneously improved. However, this would need more agricultural land since the productivity might be lower if less chemical pesticides and insecticides are used. Competition between natural fibre cultivation and food crops could become ever stronger with a growing world population.

Therefore, it is an open question - which can only be solved by sophisticated means of eco-balances or other - whether cotton textiles are really eco-friendlier than those made from man-made fibres. Developing countries, including India, producing and exporting cotton textiles are well advised to follow this discussion in the OECD countries, because the impact on their exports could be substantial if they do not shift early enough to what the consumers in the OECD countries regard as most eco-friendly fibres and processing methods.

The next environmental problem of the textile industry is water. About 100 litres of water are used in the processing of 1kg of textiles. The following stages of finishing give rise to particularly large quantities of effluent: bleaching, dyeing, mercerizing, antifelt finishing, silk weighting and water-proofing. The effluent is contaminated on the one hand, by dyes, only 60 per cent of which are absorbed by the textiles, with the remaining 40 per cent becoming waste. Synthetic dyes are not easily degradable and tend to accumulate in sewage sludge. A particularly serious problem is posed by heavy metals such as chromium, copper, tin and cadmium which are used as auxiliary agents and dyes and which enter the food chain when sewage sludge is used as fertilizer. Chromium, which is found particularly in black dyes, has a highly toxic effect on effluent bacteria (biodegradation) and fish. Moreover, dyes containing heavy metals are dangerous not only to effluent but also to consumers, since heavy metals, released by clothing when they are worn, are absorbed through the skin.

Like dyes, sizes have become a problematical constituent of effluent. Sizes are used to increase the strength of yarns for the weaving process. The substances used for this purpose, polyvinyl alcohol and polyacrylates, are not easily degradable. Organic chlorine compounds (e.g. PCP which was banned in Germany in 1990), which are used to prevent rotting and to accelerate the dyeing

process, are particularly toxic. They are a dangerous environmental toxin and do not degrade easily. A fundamental problem is raised by the lack of effluent treatment, i.e. the discharge of untreated or inadequately treated effluent into rivers, lakes and the sea.

Finally, there is growing awareness that the chemical contamination of textiles can be a health risk for textile workers and consumers. Hazards for the consumers are the allergies that may be triggered by textiles and the carcinogenic substances used in the processing of textiles, which rightly arouse their suspicion. Although it has not yet been proved that textiles cause cancer, the feeling that azo dyes, for example, may cause allergies or cancer has resulted in the textile industry voluntarily refraning from using these dyes. The prevention principle should thus also be applied to other dangerous substances, such as benzidine dyes, which have been proved to be carcinogenic.

Various analyses of cotton T-shirts in Germany have revealed the presence of formaldehyde, glyoxal and PCP and pesticide residues (Oeko Test,1992). In another case silk, cotton and wool samples were submitted to the Ames test, which is used to determine the content of genotype-modifying substances. In 19.2 per cent of the silk fabrics examined, clear evidence was found of substances which modify the genotype, only 73.1 per cent were completely harmless. In the case of cotton fabrics the negative results were higher: 87.5 per cent; the remaining 12.5 per cent could not be rated either clearly negative or positive.

Though the entire list of harmful chemicals is very large, the important ones are benzidine based dyes which are banned. These belong to direct dyes and a few vats and sulphur dyes. Pentachlorophenol used in sizing as preservative is banned and is replaced by Navdecide DM having similar properties.

4.3 German textile market

Globally, next to the USA, Germany is the second largest market for garments and textiles. The total annual sales at retail prices aggregate approximately DM 130 billion, of which apparel accounts for about 80 per cent and the rest 20 per cent home textiles, furnishings, floor coverings or fabrics.

In terms of per capita clothing consumption, Germans are the leaders: they are also said to be the most environment and health conscious consumers in the world market. Consumers are particularly critical when buying clothing and textiles for children and babies.

4.3.1 The German ban

Germany is the only country in the European Union (EU) to have imposed the ban on these chemicals agents. However, given Germany's strong clout in EU, it is possible that other member nations would follow suit.

India's two way trade with the EU is estimated between $15-16 billion. Thirty nine per cent of India's exports to the EU comprise textiles, garments and carpets. The German government ban on the sale of garments printed and dyed with carcinogenic chemicals is likely to hit Indian exports to Germany.

Germany, however has postponed its ordinance that seeks to impose a ban on the entry of Indian textiles and items using chemicals and dyes which are not found to be eco-friendly. The legislation which was to come into effect from January 1,1995, has been postponed by another six months.

The imposition of the ban, which has been a matter of debate for over three years now, has been temporarily shelved due to heavy lobbying by the Indian government. The ban, when it comes into effect, is likely to affect 41 per cent of Indian textile exports to the European Community (EC).

Inexpensive, low grade fabric qualities are designed chemically to impart a high quality surface appearance and a soft, smooth, elegant material look. The requirement profile of today's fashion class is met in full with the aid of this technology. However, this has led to a barrage of reproaches and accusations that textile products make the wearers or users ill.

The German textile industry insists on worldwide harmonisation of high level standards. In general, a substitution of mechanical treatment for chemical treatment is occuring throughout the industry, according to the Indo-German Export Promotion Project (IGEPP), New Delhi.

The IGEPP is working with the Apparel Export Promotion Council to develop a list of positive dyestuffs which could be used by the Indian textile industry, rather than, as in the past, compile a negative list of hazardous substances.

According to a study conducted by the German Development Institute, rising environment-consciousness in Germany will force Indian textile producers to focus their attention on ecological standards, if they want to maintain and diversify their export markets.

At present only product-related standards and the prohibition of certain substances such as formaldehyde or azoics have to be taken into account. In the future, the study points out, "clean processing" would become an additional requirement for exporters.

4.3.2 List of banned amines

Approximately 70 per cent of all dyes used by the Textile industry are azo dyes. These dyes are used more because they are brilliant, give adequate fastness and are less expensive. But only 25 per cent of the azo dyes are

banned today. Azo dyes appear in the following form of dyestuffs: Acid dyes, Azoic dyes, Basic dyes, Direct dyes, Disperse dyes, Pigment dyes, Chrome dyes and Mordant dyes.

As per the provisions of the German ordinance, it will be prohibited to import, sell, market or distribute textile goods which were manufactured using these banned azo dyes. Violation of such regulations can be prosecuted as a criminal offence and will be punished either by imprisonment upto 3 years or by imposing a fine.

Although only Germany has imposed these eco-regulations at present, it is expected that other European countries, Canada and some other developed countries may also do so. Further the ban is going to be extended to cover other toxic substances used in the textile processing. In this regard, as per the European Commission decision of 14th September 1994 (94/783/EC) use of Penta Chloro Phenol (PCP) is already prohibited in Germany.

For a list of banned Amines, see Table-1 (Pg.25).

4.3.3 Why these regulations now?

The eco regulations are imposed by Germany due to a variety of reasons :

1. Increasing awareness about current and future environmental problems posed by the textile industry and its products.
2. Noticeable increase in the number of textile related allergies being reported.
3. Fashion designers and marketing personnel all over the world have run out of ideas and wanted some new slogan to boost the sales of textiles.
4. Problems faced in disposing the used textile goods by the European countries, particularly Germany where the per capita consumption of textiles is as high as 11 kg of apparels and 28 kg of textiles including home textiles.
5. Cheap textiles being imported by Europe from China, India, Brazil etc., pose a serious threat to local industry, due to the competition faced by them. Consequently, the European textile industry want to use the concept of eco-friendly textiles as a protectionist barrier.

If the Indian textile industry does not take up the challenges posed by the imposition of these eco-regulations, our textile exports to developed countries will gradually taper off and consequently the Government will be deprived of the much needed foreign exchange.

4.4 Eco-prescriptions for Indian textile industry

The main issue as far as the Indian textile industry is concerned is the prohibition of the use of certain dyes and textile auxiliaries which contain these banned amines and other toxic substances. At present, the industry in India including the mill sector, powerloom, handloom, process houses and even khadi village Industries are using these harmful substances either for enhancing aesthetic appeal or for imparting certain desirable characteristics to the textiles. These toxic materials are being used in several textile processes such as sizing, scouring, bleaching, dyeing and finishing. the textile industry is using around 8000 different chemicals in the manufacture of various goods. The list of toxic and harmful substances used by the industry is given below.

4.4.1 List of toxic and harmful substances used by the textile industry

TEXTILE PROCESS	TOXIC SUBSTANCES USED
1. Cotton growing	Banned pesticides such as DDT, Dieldrin Aldrin etc.,
2. Sizing	Pentachlorophenol as a preservative
3. Scouring	Chlorinated products
4. Bleaching	Hypochlorite (chlorine bleaching)
5. Dyeing & Printing	1. Azo-dyes containing aromatic amines
	2. Dyes containing traces of heavy metals such as arsenic, lead, cadmium, mercury, nickel, copper, chromium, cobalt and Zinc
	3. Formaldehyde as a mordant
6. Finishing	Formaldehyde as a cross linking finish, urea formaldehyde as F.R. finish
7. Garment Manufacture	Stain removers containing chlorinated products
8. Packaging	Wooden boxes treated with insecticides.

The industry can start using alternative dyes and textile auxiliaries in the place of the conventional ones which contain the above listed toxic materials as these are carcinogenic in character and allergenic by nature.

4.4.2 Guidelines for industry

For the manufacture of eco-friendly textiles, the industry should adopt a cradle to grave approach.i.e. the industry should start applying eco-prescriptions right from the stage of cultivation/production of fibres and also during spinning, weaving, chemical processing, garment

manufacture and even packaging as per the guidelines given below:

- Cotton is a highly pest prone crop. During cultivation cotton plant is sprayed with different types of pesticides some of which are very harmful. The farmers should be guided to use only permissible pesticides such as neem oil, permethin, cupermethin etc, and to avoid banned pesticides.

- In the production of viscose and other manmade fibres additives are to be incorporated in the spinning dope to impart desirable properties such as fire retardancy, hydrophilicity and antistatic nature. The advantage of this method is that the chemical is entrapped inside the fibre as compared to surface application during fabric finishing.

- In weaving and knitting care should be taken in the selection of lubricants, antistatic agents and other ingredients by ensuring that they do not contain prohibited chemicals.

- Chemical processing involves highest possibilities of contamination. The need is to avoid heavy metal traces which are likely to be present in certain dyestuffs and chlorinated products containing scouring aids and stain removers. Use of formaldehyde which is likely to be present in dye fixing agents, softeners and crosslinking finishes and also as preservatives in many formulations is to be avoided. In order to reduce the use of toxic chemicals in the finishing of textiles, alternative mechanical and high temperature processing is to be adopted wherever possible. Further the use of natural dyes which are free from toxic materials should be encouraged. During garment manufacture, stain removers containing chlorinated products and spray systems using chloro fluro carbons (CFC) and fluorides must be avoided.

- For packaging, environmentally friendly materials which can be re-used or recycled should be used. Also, packing material used should be minimum in order to reduce the unnecessary waste in the importing country. It is to be noted by that wooden crates treated with insecticides are not acceptable to certain importing countries like Germany.

4.4.3 Role of government

In order to meet the challenges posed by the imposition of eco-regulations, action is being taken by the Government of India's Textile Committee, Textile Research Association and a number of organisations including Indo-German Export Promotion Project, Apparel Export Promotion Council, etc. The industry is using around 8000 and odd chemicals today for the manufacture of textiles. In this regard, a negative list is brought out by IGEP, AEPC in collaboration with Technological Institute of Textile and Sciences in Bhiwani which lists the dyestuff to be immediately avoided by the industry.

In this regard, Red listed (prohibited) chemicals used by the Industry are given in Table-2 (Pg.25).

Further, a list of chemicals which are being phased out from textile processing is given in Table-3 (Pg.26).

Some of the suggested alternatives in the textile processing is given in Table-4 (Pg.26).

List of the safe textile dyestuffs manufactured by Sandoz (India) Ltd is given in Table-5 (Pg.27).

4.4.4 Precautions to be taken by the textile industry

1. Procure dyestuff and textile auxiliaries only from reputed manufacturers.
2. Insist on getting "safety data" sheets for the dyes and textile auxiliaries procured. These "safety data sheets" will tell you whether the materials procured are free from amines and also the latest prohibited chemicals.
3. Not to procure dyes and chemicals in loose. There is always a possibility of contamination in such a case. Hence chemicals and dyestuffs should be purchased in sealed packages only.
4. Check the commercial name, C.I. No of each dye procured and ensure that they do not figure in any Red list, Negative list or Banned list.
5. Use only latest shadecards of reputed manufacturers. This is because they have already withdrawn the harmful dyes from their shadecards and provided alternative where possible.
6. Go in for eco-auditing of the textile unit which will enable the assessment of the eco-status.
7. Insist on liability declaration while procuring fibres/ yarns/finished fabrics etc. that these are free from harmful and toxic materials.

4.5 Eco auditing

Eco auditing is a systematic, documented, periodic and objective review of the facility, operation, practices and products related to meeting environmental requirements. It is the assessment of the textile unit with regard to their conformity with norms/criteria stipulated in respect of certain eco-parameters. The criteria and parameter covered by Eco-tex Consortium, Germany, which is one of the eco-label issuing organisations, is given below. The eco-audit report thus reveals the eco status of the unit for taking appropriate further action.

4.5.1 Eco-criteria and parameters

The Eco-tex Consortium assesses all textiles and garments according to segments, these criteria vary as a

result of different requirements in certain parameter ranges. All information must be supported by records, documented and guaranteed. The eco-tex-parameter and auditing system is as follows:

ECO-CRITERIA AND PARAMETERS	
1. Sizing	9. Water fastness
2. Dexizing	10. Saliva fastness
3. No alergenic dyestuffs	11. Heavy metals
4. No allergenic dyestuffs	12. Formaldehyde levels
5. No chloroganic carriers	13. pH value
6. No flameproof	14. Use of pesticides
7. No biocide finish	15. Recyclability and disposal
8. Perspiration fastness	

The maximum value of some eco-tex parameter differ according to the requirements of the product groups concerned. The assessment covers the parameters for the following:

Clothing: baby clothing, children's clothing, underwear, sleepwear, shirts and blouses, stockings, sportswear, outwear and work clothing.

Home textiles: Bed linen, bathroom textiles, household textiles, curtains and decorative fabrics.

Accessories: according to the basic materials employed.

Shoes: leather etc.

The eco-auditing performed on textile units can be classified into two categories. The various aspects covered under these two audits are listed below:

1. Product audit:

a. Assessment of conformity of the textile goods to the eco-parameters.

b. Use of the textile goods.

c. Pollution caused by their use.

d. Disposal and recyclability of the textile goods after their use.

During the product audit of the textile unit necessary information regarding the use of fibres, dye stuffs and textile auxiliaries is to be furnished along with the safety data sheets obtained from the suppliers of these items. Further the textile unit has also to give a liability declaration on the information furnished by them during the course of audit.

2. Production audit:

a. Raw materials, dyestuff and other textile auxiliaries used.

b. Energy.

c. Water.

d. Working conditions.

e. Pollution of air, water and soil.

The purpose of Eco-audit is to establish a continuous chain of information right from raw material through to the finished garment or textile product. This chain of information obtained from the company response to the questionnaires will enable the auditing organisation to have an initial assessment of the product including the fibres, dyes and other textile auxiliaries used by the audited company. Subsequently weak point analysis of the products as well as processes are conducted on the basis of the audit finding and the necessary assistance and advice are provided for the production of ecologically optimized textiles.

If the eco-auditing conducted on the textile unit is not satisfactory, then only testing of the textile products is taken up for various eco-parameters in order to ensure their conformity with the criteria stipulated. However, if the eco-auditing is found to be satisfactory, eco-labels are issued without the testing/analysis of the textile parameters.

Eco auditing will enable the manufacturer to get eco-labels. Eco-labels are the passport for exports, particularly to the European countries.

4.5.2 Analysis of eco-parameters of textiles

If the eco-auditing of textile unit is found to be unsatisfactory, then it is necessary to test the textile goods manufactured whether they are contaminated with any toxic substances and if so what is the type and extent of contamination, the details of testing equipment required for the analysis of various ecoparameters are listed out in Table-6 (Pg.28).

The limiting value stipulated in the eco-standards for the presence of the toxic substances are given in Table-7 (Pg.28).

4.6 Environmental management system standards

Similar to the ISO 9000 quality management system standards which are the equivalent of the British Standards BS5750 and environmental management system standards has been formulated during 1994 by British Standards as BS7750-1994. Certifying bodies like BVQI are certifying for conformance by organisations with the specifications given in the above mentioned standards.

All over the world, so far 25 companies have been certified for maintaining an effective environmental management system in accordance with BS7750-1994. 20 of these organisations are from Netherlands, three from United Kingdom,one each from Turkey and Denmark. These standards have been adopted by BIS as IS13967-1994.

Further, the ISO has also started developing the ISO14000 series for environmental management systems.

4.7 The US role: Skirting the issue

The US Consumer Product Safety Commission had announced a ban on the exports of a popular-styled thin rayon and cotton blended skirts from India on August 12, 1994 and scarves in September, 1995 on the ground that they were easily flammable.

Few people could have precisely predicted the US government's ban on imports of rayon skirts made in India, for being "dangerously inflammable" and therefore a consumer hazard. But no lonelegged imagination was required to foresee that somehow, somewhere, Washington would once again demonstrate its growing fervour for non-tariff instruments to influence its trading relations with other countries.

India's turn had to come. In recent months, India has volubly denounced the moves towards non-tariff regulations on international trade within the WTO framework. It has repeatedly been cautioned by the US to fall into line. And since clothing forms the most significant item of Indian exports to the US, the flimsy skirts, dramatically burnt at a press conference by officials of the CPSC, were an irresistibly inflammable excuse to show that words of warning would be backed by more demonstrative deeds. In fact, it is reasonable to assume that in the near future other considerations, such as the use of child labour or polluting technologies, are going to be used to hit a range of Indian products exported to the US.

Nobody can deny the validity of these considerations as long they are divorced from international trade wrangles. Concern in any society or nation for human safety or for environmental degradation can only be supported. But what if they are manipulated for the ends of governments or specific lobbie s ?

The distiction between buyers refusing to lift any product off the shelf due to environmental or any other consciousness, and governments playing upon these sentiments while banning imports, should never be missed. Thus, while Americans buy Indian rayon skirts singled out for the ban in large numbers (nearly 300,000 every year), that these may be a hazard has never been proved by public experience. This observation came from tests conducted by the CPSC, the basis and details of which are still being withheld. What is known is that representative bodies of American garment manufacturers have been lobbying hectically to curb the imports of these items from India - and a few other Asian countries as well - for some time.

However, the US government has agreed to allow exports on condition that the garments are tested in notified laboratories and are found to comply with US flammability standards, set by the US Flammable Fabrics Act. According to this act, any article of wearing apparel or interior furnishing, or any fabric or related material which is intended for use or which may be used in wearing apparel or interior furnishings cannot be imported into the United States if it fails to conform to an applicable flammability standard issued under section 4 of the Flammable Fabrics Act. This act is administered by the US Consumer Product Safety Commission, Washington, D.C. 20207.

Certain products can be imported into the United States as provided in Section 11(c) of the Act for the purpose of finishing or processing to render such products not so highly flammable as to be dangerous when worn by individuals, provided that the exporter state on the invoice or other paper relating to the shipment that the shipment is being made for the purpose. The provisions of the Flammable Fabrics Act apply to products manufactured in the United States, as well as to imported products.

4.8. Recommendations

Flammability criteria is one of the most important criteria for synthetic textiles as well as carpets. Manufacturers should ensure that their products conform to the flammability standards of the US. It is equally important for the textile as well as the carpet industry to be very strict about the chemicals used in processing and also the dyes. It is advisable to periodically update their list of banned chemicals and dyes to avoid difficulties in export of textiles.

References:

1. Eco-friendly textiles: Challenges to the Textile Industry, Textiles Committee, Ministry of Textiles, Govt of India "Crystal", 79, A.B.Road, Bombay - 400 018
2. Textile Proudcts: Impact assessment and criteria for eco-labelling, by dk-TEKNIK, Department of Environmental Impact Assessment, Gladsaze Mollevej 15, DK-2860 Soborg, Denmark.
3. The Emperor's New Clothes, United Nations Conference on Trade and Development, Geneva.
4. Ecological Product standards and requirements as a new challenge for developing countries' industries and exports, German Development Institute, Hallerstrasse 3, D-10587 Berlin.
5. Toward an ecological injection into international trade, Brice Lalonde, Eco-Developpement, 3 rue Roquepine 75 008 Paris-France
6. Environmental labelling schemes and ecological product standards for Indonesian export products, PEM Planungs-Engineering-Management GMBH, Dusseldorf, Germany.
7. 1994 National Trade Estimate on foreign trade barriers, Office of the United States Trade Representative, Executive Office of the President, Washington D.C.,20506
8. Textiles and Clothing - An introduction to quality requirements in selected markets, International Trade Centre, Geneva

Table - 1

LIST OF BANNED AMINES

1.	4-aminodiphenyl	12.	3,3'- Dimethylbenzidine
2.	Benzidine	13.	3,3'- Dimethyl-4,4' diaminodiphenylmethane
3.	4- Chloro-o-toluidine	14.	p-Kresidin
4.	2-Naphthylamine	15.	4,4' Methylene-bis- (2-chloraniline)
5.	o-Aminoazotoluene	16.	4,4' Oxydianiline
6.	2-Amino-4-nitrotoluence	17.	4,4' thiodianiline
7.	p-Chloraniline	18.	0-Toluidine
8.	2,4-Diaminoanisole	19.	2,4,-Toluylendiamine
9.	4,4'-Diaminodiphenylmethane	20.	2,4,5 - Trimethylaniline
10.	3,3'-Dichlorobenzidine	21.	p-Amino-azobenzene
11.	3,3'- Dimethoxybenzidine	22.	2-Methoxyaniline

Table - 2

RED LISTED CHEMICALS

1.	Mercury and its compounds	10.	Dichlovovos
2.	Cadmium and its compounds	11.	1,2, Dichloroethane
3.	Hexachlorocyclohexane (all isomers)	12.	Trichlorobenzene
4	DDT (All isomers)	13.	Altrazine
5.	Pentachlorophenol (PCP) and its derivatives	14.	Simazine
6.	Hexachlorobenzene	15.	Tributyltin Compounds
7.	Hexachlorabutadiene	16.	Fenithrothion
8.	Aldrin, Dieldrin	17.	Aziphosmethyl
9.	Endrin, Polychlorinated Biphenyls	18.	Malathion, Endosulfan

Table - 3

CHEMICAS BEING PHASED OUT FROM TEXTILE PROCESSING

Sr.No.	Chemicals	Uses
1.	Benzidine	Dye Intermediate
2.	Bensoprine	-do-
3.	hexachloropentadiene	-do-
4.	Chloro Aniline	-do-
5.	Dichloro Aniline	-do-
6.	Thiram	Bacteriostatic/Insecticide
7.	Tricholoro Phenoxy Acetic Acid	-do-
8.	Toxaphane	-do-
9.	Dibutyl phthalate	Plasticiser
10.	Tributylphosphate	-do-
11.	Chlorinated paraffins	-do-
12.	Octachlorostyrene	Flame Retardant
13.	Polychlorionated Terphyenyls	-do-
14.	Tetrachloro Dibenzo-p-dioxin	Flame Retardant
15.	Nonylphenol Ethoxylates	Surfactant in processing
16.	Arsenic Compounds	Miscellaneous uses
17.	Fluorides	-do-
18.	Decabromo diphenyl ether	Flame retardant
19.	Dichloro touluene	Carrier
20.	Trichloro benzene	Carrier

Table - 4

SOME OF THE SUGGESTED ALTERNATIVES IN TEXTILE PROCESSING

Sr.No.	Chemical used at present	Suggested alternative
1.	Chlorine bleaching	- Peroxide bleaching
2.	Benzidine based dyestuffs	- Mineral/pigment dyes
3.	Acetic acid	-Formic acid
4.	Starch based warp sizes	- synthetic ones like PVA and acrylates
5.	Kerosene in pigment printing	- synthetic thickners based on poly-carboxylic acids
6.	P/C two stage dyeing	- single class dyes like Indigosol, pigments
7.	Carding oils and anti static lubricants	- Non-ionic emulsifiers
8.	Formaldehyde	- Poly carboxylic acid method
9.	Pentachlorophenol	- Benzothiazol
10.	Alkylphenol ethoxylate	- Fatty alcholoethoxylates
11.	Sodium sulphide	- Glucose based reducing agent

Table - 5

LIST OF "SAFE" TEXTILE DYESTUFFS OF SANDOZ (INDIA) LTD

ACID (For Wool, Silk, Nylon)

SANDOLAN F YELLOW 4 GLI
SANDOSILKF YELLOW 4 GLI
SANDOLAN ORANGE N3GI
SANDOSILK ORANGE 3GI
SANDOLAN RHODAMINE EBI/
SANDOSILK RHODAMINE B1
SANDOLAN RHODINE E2GLI
SANDOLAN RED NRSI
NYLOSAN RED FRSI
SANDOLSILK RSI
SANDOLAN BR VIOLET E5BNI/
SANDOSILK BR VIOLET 5BNI
SANDOLAN RED BROWN NVL/
SANDOSILK RED BROWN VI
SANDOLAN MARINE BL 2RI C
SANDOLAN TURQUOISE EASI/
SANDOLILK TUROUOISE ASI
SANDOLAN BLUE EBRI/
SANDOSILK BLUE BRI
SANDOLAN NAVY N5RL1/
NYLOSAN NAVY 5RLI
SANDOLAN BRILL GREEN EB1
SANDOSILK BRILL GREEN B1
SANDOSILK BROWN G1
NYLOSAN BLACK WLI/
SANDOSILK BLACK WLI
SANDOLAN MILL BLACK NBGI

CHROMES

OMEGA CHROME YELLOW KI
OMEGA CHR BORDEAUS BRI
OMEGA CHROME F BLUE B1
OMEGA CHROME BROWN EBI
OMEGA CHROME BROWN 2RI
SOLAR / DIRECT

SOLAR YELLOW BGI/
SANDOSILK YELLOW BGI
SOLAR ORANGE 2 GLI
SOLAR BLUE 2 GLNI
SOLAR BLACK GI

DRIMARENE (Reactive Dyes)

DRIMARENE YELLOW 4 GLI
DRIMARENE ORANGE 3 RLI
DRIMARENE SCARIET PRI
DRIMARENE BLUE RLI
DRIMARENE TURQUOISE PBI
DRIMARENE VIOLET P 3 RI
DRIMARENE YELLOW P 2GI
DRIMARENE YELLOW 3 RI

FORONS (Disperse Dyes)

FORON YELLOW SFLI
FORON YEL BROWN S2RFLI
FORON BRILL ORGANGE ERLI
FORON BRILL RED SRGLI
FORON BRILL RED SRCLKI
FORON RUBINE S2GFLI
FORON SCARLET E2GFLI
FORON SCARLET S3GFLI
FORON RED VIOLET SE-2RLI
FORON BRILL VIOLET SE3RLI

FORON NAVY S2GRLI
FORON BLUE SE2RI
FORON BROWN S3BLI
FORON BLUE SE4RI/
FORONBLUE RD-4RI
FORON BROWN S3RELI
FORON GREY S4GLI
FORON YELLOW RD 4 GRLI
FORON YEL BROWN RD 2RS1
FORON BLACK RD 2GSI
FORON SCARLET RD FRSI
FORON BLUE RD GLF1
FORON RUBINE RD GFLI
FORON BLACK RD 3CI
FORON NAVY RD RLS
FORON SCARLET RD 2GSI

LANASYN (1:2 METAL COMPLEX DYES)

LANASYN YELLOW GLNI
LANASYN YELLOW 2RLI
LANASYN YELLOW 2GLNI
LANASYN YELLOW 2 RLKI
LANASYN ORANGE LNI
LANASYN RED CF
LANASYN BORDEAUX SMBI
LANASYN DARK VIOLET RLI
LANASYN NAVY BLUE SDNLI
LANASYN BROWN 2 RLI
LANASYN BLACK SDLI

OTHER DYES (1:1 METAL COMPLEX)

VITROLAN BLACK WAI/
SANDOSILK BLACK WAI
DRIMARENE YELLOW 3 GLI
DRIMARENE GOLD YEL 2RLI
DRIMARENE BRILL RED 4BLI
DRIMARENE BRILL RED BLI
DRIMARENE NAVY BLUE RBI
DRIMARENE BLACK PBNI
DRIMARINE BRILL RED 6 BI
DRIMARENE GREEN 2 BI

Table - 6

DETAILS OF TESTING EQUIPMENTS REQUIRED

No.	Eco-Parameter	Equipment required
1.	Dyestuff which release Aromatic Amines (Carcinogenic)	High Performance Liquid Chromatography & High Performance thin Layer Chromotography
2.	Fastness to perspiration	Perspirometer
3.	Fastness to Water	Wash Wheel Machine
4.	Presence of heavy Metals	Atomic Absorption Spectrometer 7 accessories
5.	Free Formaldehyde Content	UV-Visual Spectrometer
6.	pH of aqueous extract	pH meter
7.	Presence of Pesticides	1) Gas Chromatography with Mass Spectrometer
		ii) FTIR, Fourier Transforming Infra Red Spectrometer
8.	Presence of Penta Chloro Phenol	i) Gas Chromatography with Mass Spectrometer
		ii) High enformance Liquid Chromatography
9.	Biological Oxygen Demand, Chemical Oxygen Demand	BOD & COD monitors

Table - 7

ECO-STANDARDS FOR VARIOUS ECO-LABELS IN EUROPE

Parameter	Eco mark			
	M.S.T.	**OTN 100**	**Cleanfashion**	**Steilmann**
Free formaldehyde	0.03%	300 ppm	0.03%	500
- close to skin	0.0075%	75 ppm	0.0075%	300 ppm
- baby clothing	0.002%	20 ppm	0.002%	50 ppm
Pesticides				
DDT	1.0mg/kg	-	-	-
HCH	0.5 mg/kg	-	-	-
Lindan	1.0 mg/kg	-	-	-
Adrin	0.2 mg/kg	-	-	-
Dieldin	0.2 mg/kg	-	-	-
2.4 D	0.1 mg/kg	-	-	-
2.45.T	0.05 mg/kg	-	-	-
Toxaphen	0.1 mg/kg	-	-	-
Sumparameter	1.0 mg/kg	-	-	-
Pentachlorophenol	0.5 mg/kg	-	0.5 mg/kg	ban
Heavy metals		-	-	ban in silk products
As	0.01 mg/kg	-	-	-
Pb	0.04 mg/kg	-	-	-
Cd	0.005 mg/kg	-	-	-
Hg	0.001 mg/kg	0.01 ppm	0.1 mg/kg	-
-baby clothing	0.001 mg/kg	0.02 ppm	0.02 mg/kg	
Ni	0.2 mg/kg	10 ppm	10 mg/kg	Specification (*)
-baby clothing			1 mg/kg	-
Cu	3.0 mg/kg	100 ppm	50 mg/kg	-
-baby clothing	3.0 mg/kg	30 ppm	10 mg/kg	-
Cr III	0.1 mg/kg	20 ppm	20 mg/kg	-
Co	0.2 mg/kg	20 ppm	1 ppm	-
Zn	5.0 mg/kg	-	-	-
Azoic dyes containing carcinogenic aromic amines		-	ban	ban
Halogenic carrier	-	-	-	ban
Chlorine bleaching	-	-	-	to avoid

CHAPTER-V: PACKAGING

5.1 Background

Major developments are taking place in the area of packaging regulations concerning materials, recycled content provisions, product charges, deposit refund systems and 'take-back' obligations in the developed countries. Standards and regulations regarding the physical characteristics of products and materials require, for instance, that packaging be suitable for recycling or reuse. Noncompliance with such regulations by exporters in developing countries may result in restrictions on market access for both the packaging material and the product contained within.

At present there are no international environmental agreements related to packaging specifically. However, the wide variations and rapid changes in regulations, particularly in Europe and North America, are causing considerable confusion and uncertainty for developing country exporters who are faced with competing claims of different packaging types and packaging materials in various markets.

A particularly complicated scenario may develop in the European Community where some instruments will apply nationally and others community wide. A similar situation could arise because of the NAFTA ecolabelling, packaging and recycling requirements which may present developing countries with some additional barriers to their exports.

Environmental regulations in developed nations pose many problems to exporters from developing countries who use indigenous materials like wood, jute and other textile fibres for packaging of products. The regulations require that packaging material must be recovered or recycled. As the packaging materials like wood or jute are not normally produced in developed countries, the facilities for recycling of such materials do not exist in these nations.

So the importers often refuse to buy products packed in such materials. A number of exporting countries fear that they may have to use other more expensive material for packaging to comply with such regulations.

Broadly, environmental matters are not confined to national boundaries. No major importer would nowadays be willing to bring in goods produced in environmentaly less benign conditions abroad, even if they are cheap. Environmental awakening in the industrialized markets could thus have far reaching consequences for the rest of the world.

Take this particular case. The Canadian Council of Ministers for the Environment (CCME) while adopting policies related to packaging and waste management in their country, observed that the regulation will apply to all packaging used, including that of imports. This, they reasoned was to ensure a "level playing field" approach and to prevent any product or package getting a competitive advantage at the cost of the environment. This might be the attitude of all developed countries in future.

So now it has become important for exporters to keep in close touch with trade associations and related institutions in the foreign markets to keep track of developments in the area of environmental regulations.

5.2 Packaging materials and disposability

Environmental science is still in its infancy. Because of this, there is no reliable established methodology to determine the magnitude of the impact of packaging items on the environment. In the absence of any yardstick, the legislative developments related to packaging materials in the industrialised countries tend to be arbitrary and ad hoc, responding to local pressures. In some instances these have resulted in a bias favouring certain materials because of strong local industrial pressures, or of their perceived environmental superiority over others.

5.2.1 Main packaging materials

Some of the important packaging materials are: paper and board, plastics, aluminium, glass, steel (mainly in the form of tinplate), and plastics. Wood and other vegetable materials such as jute remain significant in the field of transport packaging, particularly for exports.

The consumption of each of the five main retail packaging materials in Europe during 1987-88 is given below:

Consumption of Major Packaging Materials in Europe 1987/88 - ('000 metric tons)

Country	Tinplate	Aluminium	Glass	Plastics	Cartons (folding)
EEC	3,140	343	11,950	4,635	2,363
SWEDEN	100	9	100	200	90
NORWAY	80	4	60	100	22
FINLAND	80	1	46	100	30
SWITZERLAND	-	13	236	130	86
AUSTRIA	-	5	208	100	59
TOTAL	**3,400**	**375**	**12,600**	**5,265**	**2,650**

Each type has a certain set of performance and other characteristics, which are seldom interchangeable, and fulfills specific requirements in its packaging applications.

5.2.2 Paper and board

The main advantages of using paper and board are their low cost for a given level of rigidity, and their promotional potential. They also have a good environmental image because of the renewable nature of the raw material and apparent biodegradability.

However, as these products provide no barrier to gases and lose their strength and rigidity when wet, they need to be coated or laminated with impermeable materials to achieve these properties. This makes it technically difficult and costly, though not impossible, to repulp and hence recycle them for similar applications. This deficiency is sought to be circumvented by recovering laminations from board, aluminium and polythylene.

This effort has somewhat borne fruit with the making of hardboard by heat-compression of flakes obtained from shredding recovered materials. The hardboard produced has a higher rigidity than normal types, because of the presence of some aluminium. It also has superior wet-strength and some formability due to the polyethylene used to insulate the board from liquids. In addition, the polymer acts as the structural binder for the hardboard.

5.2.3 Glass

Glass is a popular packaging material because of its aesthetic qualities, clarity, high heat resistance and longevity. The material is derived from an unlimited raw material source and can be easily recycled. The disadvantages are its heavy and fragile nature.

Its ancient origin and traditional image has made it acceptable to environmentalists. The industry has been pro-active rather than reactive in its response to environmental issues and has been preparing for them by establishing highly effective collection networks and recycling infrastructures throughout Europe and North America. Also as recycling saves substantial energy involved in manufacturing it from sand and soda ash, the acceptability of glass bottles and jars is high. Its other qualities such as high heat resistance and non-absorbent nature makes it easy to clean and excellent for re-use. It is therefore the preferred material where re-filling is practised.

5.2.4 Steel

Tinplate, or tin-coated steel plate, has been a popular packaging material for many decades. Food canning industry evolved with the availability of tinplate because of its good heat resistance which allows high temperature food sterilization. It is readily printable and lends itself to very high production rates.

Its main disadvantage is its tendency to corrode in the absence of protection. Its major advantage is that it can be easily separated from mixed waste using magnets. Although large scale recycling of steel cans has started only recently, the environmental image and prospects of the material are regarded as relatively good.

Steel is the most widely used metal in the world. It has traditionally been recycled; worldwide as much as 40 per cent or about 300 million metric tons of steel scrap is reused in steel production. Currently, about 900,000 metric tons of tinplate from cans are recycled every year in Europe.

5.2.5 Aluminium

Aluminium has some interesting properties which make it desirable for a variety of packaging applications. It withstands gases. It is lightweight and can be converted into thin, pliable foils, suitable for laminating to other materials.

Like tinplate, aluminium can be converted into packages at high speeds of about 2000 cans per minute. Like tinplate, aluminium cans require surface protection against corrosion by acidic products.

Aluminum is produced from bauxite, a mineral which occurs in abundance in nature. But the recovery process consumes large quantities of electricity. Once extracted, however, the energy input to recycle aluminium is only a fraction of the initial energy investment.

Aluminium is an ideal material for recycling. It has good scrap value. Therefore, there is an incentive to reclaim the metal from packaging waste. The economics of collection and recycling of aluminium for packaging applications are generally favourable.

Aluminium is a major material for beverage cans in the United States of America and the industry is well advanced with the setting up of good waste collection infrastructure. About 62 to 64 per cent of the cans are recycled in the US while the world average is only around 50 per cent.

5.2.6 Plastics

Lightweight and amenable to various designs, plastics is a popular packaging material. Plastics are widely used in food packaging due to its good hygienic qualities. A recent German study pointed out that these qualities have resulted in considerable reduction in the weight, volume and costs of packaging.

However, plastics have perhaps the most negative environmental image, for a number of reasons. In fact, the global environmental movement started as a

consequence of the ever-growing accumulation of plastics waste mainly because of its inability to be destroyed easily.

Considerable efforts are now on in North America and in Europe to improve the environmental status of plastics, by setting up the necessary collection networks and by developing appropriate recycling technologies and end-use applications.

All plastics have intrinsic calorific values higher than wood and paper. In the case of polyethylene and polypropylene, the values are even higher than for gas oil. Incineration with energy recovery may be therefore a valid option for the disposal of plastics packaging waste, particularly where sorting and separation into individual plastics is difficult and expensive. The presence of plastics in municipal waste helps its effective incineration.

Because of legislative pressures, the polymer producing industry is now actively examining ways of recovering intermediate chemicals and monomers from plastics waste. The industry has also shifted its attention to other plastics derivatives such as PET (polyethyleneterepthalate) which is widely used for making containers, different types of polyolefines and PVC (polyvinyl chloride). The technology appears to be viable and there are reports that a plant with a capacity to process 200,000 metric tons of plastics waste could be commissioned this year in Germany.

PET, though not as yet the main plastic packaging material, is the most extensively recycled plastic at the present time. It is primarily used for beverage bottling, and can thus be readily identified by the consumer. As a result, it is easier to collect than other plastics. It also has a high intrinsic value and there are well developed markets for the end products of its recycling, such as carpet fibres and fibrefill. Recycled PET has been approved by the Food & Drug Administration of the US for food packaging applications, and the Coca Cola company has started using bottles containing about 25 per cent of this PET.

High density polyethylene (HDPE), low density polythylene (LDPE), linear low density polyethylene (LLDPE) and polypropylene (PP) - known collectively as polyolefines - form the most important group of plastics used in packaging. They are used extensively in both flexible and rigid packaging applications and represent as much as 65 per cent of the plastic fraction in municipal solid waste.

Polyolefines also have the highest calorific values of all the constituents in the packaging waste stream, and are therefore prime candidates for disposal through incineration with energy recovery.

Compared with most other polymers, PVC requires lower amounts of energy to produce. It is made up of chlorine (54%), derived from rock salt, and ethylene (43%) produced from crude oil. Most other polymers are made entirely from crude oil.

PVC can be readily recycled. A Belgian chemical company has developed the technology to recycle the material from collected PVC mineral water bottles. In this system, the recycled PVC is sandwiched between inner and outer layers of virgin polymer in coextruded PVC pipes for drainage systems.

PVC and other chlorine-containing materials have come under suspicion because of worries about hydrochloric acid gas and dioxin emissions which can occur when they are incinerated. The considerable work carried out to date has established no direct link between the presence of PVC in wastes and the amount of dioxin generated. Such worries are unfounded provided incinerators are fitted with acid-gas scrubbers and temperatures are maintained above specified levels. These practices would in any case be mandatory in most countries.

Switzerland has enacted a law, effective since November 1991, which bans the use of PVC for food and beverage packagings.

When complete data for assessing PVC's total environmental impact is available and methods to separate it cleanly from other polymers and recycle are fully developed, PVC will be considered in a more environmentally favourable light.

Interestingly, three of the largest European retailing groups, Marks & Spencer and Sainsbury in the United Kingdom and Migros in Switzerland, have publicly declared their acceptance of PVC as an environmentally acceptable packaging material, when used and recovered correctly.

5.2.7 Jute

India is a major exporter of jute mainly for packaging. In Germany, jute sacks are used extensively for the transport of certain foodstuffs, especially coffee, cocoa, legumes, spices and dried fruit, tobacco, cotton and wool. However, residues found in jute packaging have caused concerns about contamination of foodstuffs.

5.3 ENVIRONMENTAL LEGISLATION

5.3.1 Europe

The European Commission has taken the lead to harmonise the environmental guidelines governing wastes from packaging materials.

DGXI, the directorate responsible for EEC environmental affairs, has prepared a draft legislation in consultation with member states to harmonise the environmental regulations. At the same time, this will safeguard the tenet of free trade within the Community which is basic to the Treaty of Rome.

The EC directorate has developed a strategy to cover the gamut of issues related to waste management, by setting priorities to guide member states. These priorities are:

1. Reduction of waste
2. Re-use or recycling
3. Raise standards of landfill

Till recently, the environmental regulations relating to packaging have been largely focused on liquid products for human consumption, because of the rise in the packaging of these products and a dramatic increase in litter. However, in view of the perceived worldwide solid waste disposal crisis, the attention has now shifted to include all packaging. This was mainly because of the fact that beverage containers in domestic waste constitute only 5 per cent of the total by weight, whereas all packaging represents 25-35 per cent.

The DGXI issued a final draft proposal on waste reduction on February 21, 1992 after extensive consultations with members and industry. This draft, perhaps with minor modifications, is expected to be enacted soon.

5.3.2 The European Packaging and Packaging Waste Directive (Proposal)

The proposed European Commission directive on packaging waste is presented as a uniform measure which will apply throughout this single European market.

The directive is aimed at achieving harmonisation in this crucial subject by laying down a common approach, and thus minimizing hindrance to the flow of packaged goods within the market.

The draft has also acknowledged the important economic and social role played by packaging:

- It assists the safe transport of products worldwide, thereby enlarging consumer choices;
- It preserves packaged goods so that production and consumption can be balanced world wide;
- It informs the consumer about the nature of the goods with the pack;
- It allows the portioning of products into weight and volume units most appropriate for consumer use;
- It gives regular shape and dimensions to the product, optimizing use of transport and storage space;
- It allows branding of the products for easy identification;
- It facilitates product diversification so as to adapt the product to different consumer tastes and needs;
- It ensures hygienic handling and transport of the product;
- It concentrates product waste at the packer's plant, thus avoiding its accumulation at the household level.

The objective of this directive is to introduce measures to be undertaken by members states to reduce the overall impact of packaging on the environment without creating obstacles to trade within the Community:

- Quantitative reduction and qualitative improvements of packaging wastes;
- Maximizing the recovery of packaging waste;
- Minimizing of the quantities of packaging waste requiring disposal.

5.3.3 Packaging categories

The directive would affect all packaging and packaging waste in the European Community, whether it is industrial, commercial, office, shop, service or household level. It would be applicable to primary (sales packaging), secondary (group or multipack packaging of sales packs) and tertiary (handling and transport) packaging, irrespective of the packaging materials used.

5.3.4 Targets

The directive would set the following targets, to be met no later than 10 years after it comes into force:

- 90 per cent by weight of the packaging waste output removed from the waste stream with a view to its recovery;
- 60 per cent by weight of each material in the packaging waste stream would be recovered for the purpose of recycling it (excluding energy recovery);
- No more than 10 per cent by weight of packaging waste would be subject to final disposal;
- Landfilling would be used only as a last resort.

The member states would be required to submit plans specifying when the following intermediate targets, to be attained simultaneously, would be achieved:

- 60 per cent weight of packaging waste removed from the waste stream for recovery; and
- 40 per cent by weight of each material in the above would be recycled.

In addition, the member states would be obliged to report progress towards these targets every three years.

Industry considers these targets to be ambitious, perhaps requiring major changes in consumer habits. To meet them, extensive kerbside collection of recyclable materials and very active promotion of reusable packaging through deposit-return and compulsory-return systems would be essential.

5.3.5 Economic instruments

a. Banned packaging

Any packaging for which no channels for return and subsequent reuse or recovery are established, will be banned no later than five years after the directive becomes law.

b. Collection and recovery

It would be the responsibility of the Member States to take measures for the setting up of systems to:

- provide for the return of used packaging; and
- ensure that the used packaging collected is effectively reused or recovered.

c. Marking Provisions

To facilitate the recovery of packaging waste and re-use of packaging, all packaging would have to bear the appropriate marking(s) in compliance with marking provisions either on the packaging itself or on the label, not later than five years from the time the directive becomes law.

In the provision numbers have been allocated to the various packaging materials, for identification purposes, as follows:

1 to 19 for plastics

20 to 29 for paper and carton

30 to 39 for cardboard

40 to 49 for metal

50 to 59 for wood

60 to 69 for textiles

70 to 79 for glass

No marking has been decided, as yet, for reusable or recoverable packaging, or that made partly or entirely from recycled materials.

5.3.6 Conformity

Only packaging which complies with the essential requirements set out below would be allowed in the European market:

a) Composed of the minimum amounts of materials necessary to maintain the levels of safety and consumer acceptance for the packed products.

b) Designed to permit reuse or recovery and to minimize impact on the environment as a result of disposal.

c) The amount of hazardous metals and other harmful substances should be minimized.

d) Once the directive becomes law, concentration levels of lead, cadmium, mercury and hexavalent chromium present in packaging will not be allowed to exceed the following limits:
   - 600 ppm by weight after 2 years;
   - 250 ppm by weight after 3 years;
   - 100 ppm by weight after 5 years.

e) the requirement specific to reusable packaging are that:
   - the physical properties should be such as to allow for specified number of expected trips;
   - it should be capable of being cleaned to meet defined health and safety standards; and
   - after it can be no longer reused, its constituent materials, can be recovered for recycling or for energy recovery.

f) The requirement specific to packaging recoverable as material for recycling, energy recovery or composting are that:
   - It is practicable to recover a defined minimum percentage by weight of recycled material from the packaging waste concerned.
   - It shall have a calorific value when used for energy recovery of at least 13 MJ/kg, i.e. about that of paper and board.
   - It shall not give rise to ash residues of more than a defined maximum percentage by weight of the incinerated material.
   - If used as a substitute for other common fuels, it shall not create a greater environmental impact than them, in terms of emissions and residues.
   - If used for composting, it should be of a biodegradable nature, compatible with the other materials involved and should not in any way hinder the composting process or diminish the quality of the end product(s).

5.3.7 Compliance

Till the infrastructure to collect, sort and recover packaging waste, is in place throughout the EC, and markets created for the recovered material (particularly plastics), the costs of compliance with the directive will be high.

As in the case of the German packaging ordinance already in force, the principle of “the polluter pays” is the basis for the directive. The industry considered to be the polluter is, thus, asked to take on a new responsibility without financial help from the governments and the costs of waste recovery for these governments are correspondingly reduced. This will force it to respond with more cost effective solutions though new approaches to either packaging or distribution.

The directive may thus have far-reaching consequences for merchandising, retailing and international grade, not just in Europe but perhaps throughout the world.

5.4 Germany

Environmental legislation affecting packaging and packaging wastes and applicable to both locally produced and imported packaging was enacted in Germany in 1990.

About 32 million tonnes of household and industrial waste is disposed of each year in the old Federal Republic of Germany alone. Dumping capacity available in many Federal Lander regions is now sufficient for only 2 to 5 years. After this period there will be neither adequate waste incineration nor dumping capacity available.

Germany was the first European country to announce one of the most radical pieces of legislation affecting packaging waste. Because of its comprehensive nature, it may be adopted by other European nations too. The German environment ministry believes that the enacted measures will help in avoiding litigation between Germany and the EC concerning harmonisation. This was because the ordinance will not discriminate between materials, but only between refillable and non-refillable packages.

5.4.1 Packaging Waste Ordinance

The German legislation is thus crucial to the understanding of future trends in legislation related to packaging waste in Europe, and is therefore discussed in some detail in the following paragraphs.

This now widely publicised German ordinance came into force on 1 December 1990. In the section entitled "Duty to take back", two of the three provisions related to the duty to take back returned transport packaging and outer packaging, have since become effective.

The important features of this ordinance are:

- It affects all types of packaging including:
  - transportation of transit packaging;
  - outer or secondary packaging, and
  - sales or consumer packaging.
- It bans the sale of all packaging which cannot be re-used, recycled or incinerated for energy recovery, and recycling is given a very high priority.
- It obliges the distributor/retailer to remove the transit or transport packaging such as paperboard outer boxes, plastic foam granules or film and other transit packaging, before offering the product for sale, or else provide a receptacle so that purchasers can remove this material in the store rather than take it home.
- It obliges the retailer to take the goods out of their secondary packaging, such as blister packs or film wrappers, at the point of sale, or else provide a receptacle so that purchasers can leave this material in store.
- It obliges the filler/distributor/retailer to set up adequate collection facilities for used packaging either at the store or within his sales catchment area.
- It imposes a mandatory deposit on all non-refillable beverage containers and on plastics containers for laundry cleaners and household cleaning products, with the exception of refill packs.
- It imposes a mandatory deposit of DM2 on containers for paints, solvents, pesticides, oils and other hazardous household products.
- The responsibility for the collection and recycling of all packaging waste associated with the goods now lies for the first time with the filler/distributor/retailer, and must be carried out outside the public waste disposal system.
- There are labelling requirements associated with the ordinance, according to which it is mandatory to declare on the pack the material it is made from, and the return system applicable. In addition, it will be mandatory to post signs in the stores to make consumers aware of their right to remove the packaging from their purchases before taking them home.

All the above conditions are not required if a separate, consumer-friendly system for collecting the packaging is established by the filler, distributor or retailer.

The ordinance exempts the used packaging from hospitals, doctors' practices, blood banks, laboratories and similar institutions, which must use seperate waste management systems.

5.4.2 Duales system for recycling

The German decree on packaging waste allows for and anticipates consumer-friendly collection systems being set up by industry, since this is seen as a more manageable alternative than having packaging waste collection handled by retail distribution networks.

An umbrella corporation, called "Duales System Deutschland" (also known as "Dual" System) has been set up by German industry to finance and manage packaging waste collection and recycling.

It is backed by a large number of individual companies from the various branches of industry concerned, including retailers, packers and packaging manufacturers, with other sectors expected to follow.

Within this system, the German plastics industry, for example, has set up a company called "Verwertungsgesellschaft fur gebrauchte Kunststoffe (VGK)", which is open to all polymer manufacturers and converters.

The following are the main elements of the system set up by the Duales System Deutschland Corporation:

- All packages designed to be collected through the system will be awarded a Green Point label. For each package produced bearing this label, the Corporation receives a fee which averages about 2 Pfennigs.
- All households in Germany will be provided with yellow bins, free of charge, in which the discarded packages bearing the label are thrown into, the bins being emptied at regular intervals again free of charge.
- A company, Intersero AG, has been set up and entrusted with organizing the collection and sorting of packaging wastes on behalf of Dual System. It integrates existing systems of collection banks for glass and paper and kerbside collection of metal, plastics and composite packaging wastes.
- After have been collected and sorted onto the main categories, i.e. glass, paper, metals, plastics, etc., the recovered materials are made available free of charge for recycling.

5.4.3 "Green Point" Label

According to the system, the corporation will license participating companies to use "Green Point" on their packaging in return for a corresponding fee per item.

Without the Green Point label, a package will not be handled by this privately run collection system and will, therefore, be subject to the penalties of the deposit mandate. A similar system, proposed but not as yet established, would be devoted to the collection of packaging contaminated by its contents.

In order to ensure that such systems will help realize the objective of reduced packaging wastes, the German authorities have set down stringent requirements and targets.

5.4.4 Impact on the imported packaging

The decree discriminates in favour of reusable/refillable packaging and against one-way packages. Packaging imported into Germany will be subject to exactly the same laws which apply to locally produced packaging. The impact of the decree on imported packaging is expected to be the same as on that produced locally.

Most of the imported packaging, be it from other European countries or from developing countries, would, except in some special cases, be of the one-use type, and hence subject to the deposit mandate, unless it can be collected through the "Dual" system. To be eligible, the imported packaging (including paper/cardboard) will have to be recyclable or suitable for incineration to recover its energy content, and must bear the "Green Point" label. This will have to be obtained by the importer, who will need agreements with the manufacturers of similar packaging or the suppliers of similar materials in the country, to guarantee that it can be re-utilized and is acceptable within the system.

5.5 United Kingdom

While introducing the UK Government's White Paper on environment, entitled "This Common Inheritance" in September 1990, the Environment Secretary stated: "This White Paper maps out the main areas of environmental concern and the measures which the Government is adopting to deal with them in the UK, in the European Community and in the world at large."

The White Paper represents the first ever comprehensive review of environmental policy by a British government and is the basis from which its "Environment Protection Bill" will be derived. It reviews all aspects of environmental concern and amplifies the approach adopted by the Government.

Control of waste will be done by local authorities who will be empowered to impose responsibilities on person generating or having control of waste, and duty for aftercare on landfill site owners.

The Government is still undecided about packaging waste and has promised to hold dialogues with industry and the retail trade to explore ways of reducing it. There have been a number of such meetings and industry has put forward a plan through the Consortium of the Packaging Chain (COPAC), a body representing various industry associations.

The plan addresses the government's target of recycling and composting 50 per cent of recyclable household waste by the year 2000 (estimated to be 25 per cent of all household waste) and confirms COPAC's commitment to assist in achieving this target.

5.5.1 British Retail Consortium

Modern retailing is inextricably linked with packaging. Concerned about the current legislative developments and trends in public opinion, retailers are actively developing policies aimed at improving environmental management of retailing.

British Retail Consortium's (BRC) Environment committee has, for example, drafted guideline notes on retail packaging for use by the retailers and their suppliers. These were announced at the PAKEX'92 exhibition in Birmingham. The plan of action entails measures to reduce quantities of packaging, to increase the level of recycling and reuse and to work towards a system which selects packaging materials based on their established and accepted levels of environmental impact.

5.5.2 UK Environment Protection Act

The British Environment Protection Act was passed in

late 1990. According to articles relating to solid waste, collection authorities run by local government are required to draw up recycling proposals in consultation with the relevant organisations in the area under their jurisdiction, including private companies. As a result, new collection agencies will be set up and it will be the duty of waste disposal bodies to credit them with the savings made from recycling.

The authorities will be allowed to select the most environmentally acceptable option, which may not necessarily be the cheapest.

The Act anticipates that landfilling and other disposal costs will go up as a result of much stricter controls and this will make the recycling option more attractive.

Neither the Environment Protection Act nor the White Paper refers to any specific taxation on packaging at present, but leaves such an option open should it be thought necessary to help meet the targets in future.

5.6 North America

With 50 states in the United States of America, each with its own, often unique set of environmental priorities, the legislative scene has become extremely fluid, and information about it requires continual updating. Over the period 1988/91 there was a rise in the number of bills concerning plastics packaging waste alone. In 1991, 500 solids waste bills were introduced in 48 states. In this situation, any detailed treatment of legislative activity related to environment across the country would be impracticable within the scope of this report and only a broad assessment is therefore attempted.

Canada is a country conscious of its rich natural resources. Among the environmental issues on its agenda, packaging waste management assumes a high profile because it is considered to damage these natural resources as well as causing overall environmental degradation. Canada, perhaps more than any other country in the West, has approached the whole issue by involving all interested parties (called the Stakeholders) in the process of policy development with reference to packaging waste.

5.6.1 United States of America

The US has strict air, water and land pollution regulations, which affect all industries and business operations. As in the rest of the developed world, the country faces a solid waste disposal crisis. Per capita waste generated is about 500 kg per annum and is twice that produced per person in Japan and Europe.

Although space is not as grave a problem unlike Japan, disposal sites are being pushed farther away from the cities, making solid waste disposal increasingly expensive; disposal fees in some areas have soared to as high as $100 or more per ton.

There are about 6000 legally operated landfill sites in the US which between them absorb about 80 per cent of the waste; a further 10 per cent is incinerated and 10 per cent recycled. The solids waste crisis has, in fact, focused the attention of people and politicians alike on the apparent wastefulness of the modern way of life. This has resulted in a general desire to bring some restraints to bear by means of legislation. The main thrust of the legislative actions affecting packaging is directed towards minimising its contribution to solid waste through the following activities and policies:

- Mandatory recycling/kerbside collection;
- Mandatory deposits;
- Labelling of plastics packaging;
- Mandatory use of degradable plastics;
- Ban on particular types of packaging.

The Environmental Protection Agency (EPA) of the US has laid down priorities and targets to deal with solid waste as follows:

- Weight and volume (reduction at source)(25% reduction)
- Recycling (25 per cent increase)
- Incineration (with energy recovery of 20 per cent)
- Landfill (only as a last resort)(30 per cent increase).

Significant levels of source reduction are not easy to achieve, since they normally require changes in distribution, marketing and usage. Nevertheless, there are various bills before Congress, which accept the priority of source reduction - reducing quantities of material used at the point of production or use -over the other methods. Source reduction may entail changes in the design of both the products and their packaging to reduce waste. It also requires consumers to alter their purchasing habits and improve product usage methods. Some of the bills include provisions to establish packaging standards aimed at reducing the quantities being used. Recycling is increasingly popular and is attracting the most interest. This is particularly the case because incineration, in having to meet increasingly stringent emission standards and find sites remote from human habitats, is becoming unacceptably expensive, and new capacity hard to come by.

5.6.2 Recycling/Kerbside collection mandate

Because of the shortage of landfill capacity, mandatory kerbside collection and recycling legislation has been passed in many states. As a result, quite high recovery and recycling rates (70 to 90 per cent) have been achieved for newsprint, glass and metal packages. Because of the difficulties created by the variety of plastics used in packaging, for only specific types - PET for carbonated

soft drinks and HDPE for milk and household goods - are usually collected and recycled.

Mandatory deposit laws are in force in many states aimed at increasing the return of empties and achieving high recycling rates. Aluminium cans and PET bottles for beverages are particularly targeted.

5.6.3 Labelling of plastics packaging

A voluntary number-coding system for plastics packages has been developed by the Society of Plastics Industry,Inc. (SPI), to identify various types of plastics and thus to aid the sorting process. Members of the National Association for Plastics Container Recovery (NAPCOR), a nonprofit association of major manufacturers of resins and plastics packaging, have pledged to use this coding. Some states have already made its use mandatory.

It appears that the US SPI number-coding system, or a close equivalent, will be adopted in Europe for plastics packaging.

5.6.4 Degradable plastics

It is now largely accepted that biodegradability of wastes is not necessarily helpful in ensuring product breakdown and thus extending the life of a landfill site; even vegetable and meat wastes take a long period to biodegrade in landfills. In some states such as Florida, however, photodegradability of plastics is considered necessary to minimise litter and multipack holders made from polyethylene must be photodegradable.

5.6.5 Bans

Bans have been imposed on specific package types by some states and local governments because they are either difficult to recycle or to dispose of. Examples of the packaging thus targetted are nonrefillable beverage containers; nonrecyclable containers; disposable diapers and various other plastics products including foamed polystyrene containers.

5.6.6 "Model" Waste reduction legislation

In 1990, the Coalition of Northeastern Governors (CONEG) established the Source Reduction Council (SRC) as a consensus-based partnership of state government officials, representatives of public interest organisations and concerned industry executives to advise the Northeastern governors on a coordinated regional strategy for reduction of packaging wastes. The SRC has developed what are called "Preferred Packaging Guidelines", listing steps which industry can take to help the states to reduce waste. The Council is also known to have drafted "model" legislation concerning reduction in packaging waste, with the following key elements:

- Packagers are set a target of 15 per cent reduction by weight in their total contribution of packaging to the waste stream by the year 1996, with 1988 as the base year.
- Packagers may comply by using any combination of waste reduction techniques, i.e. source reduction, reuse and recycling.
- Packagers are given a credit which is 1.5 times the actual reduction achieved, if a package or packaging component is totally eliminated, or if the source reduction facilities or increases the recycling rale (25 per cent minimum improvement) of a package.

5.7 Japan

As the second largest industrial power, Japan consumes large quantities of materials and is faced with the disposal of a considerable amount of waste. Being a small crowded island, the country has only a limited landfill capacity and consequently about 70 per cent of the waste is incinerated.

The legal framework to deal with environmental aspects in Japan is based on "Public Nuisance Countermeasures Basic Law." Among the various regulations in the framework, those concerning the management of waste generated from various sources -households, shops, offices and factories - include:

- Waste disposal and Public Cleansing Law (the Waste Disposal Law);
- Air Pollution Control Law;
- Water Pollution Control Law;
- Law for the Prevention of Marine Pollution and Maritime Disaster; and
- Law for the Regional Coastal Environment Centres.

From among these, the Waste Disposal Law applies closely to packaging waste. The law is designed to improve and preserve the environment and to improve public health through the promotion of adequate waste disposal.

5.7.1 Impact on imported Packaging

Local authorities will be responsible for carrying out efficient management of waste disposal. The authorities can call on prefectural governments to provide technical help. As Japanese packaging is often of comparatively high quality and complexity, the authorities do not foresee any difficulty in dealing with imported packaging, particularly paper/board and plastics packaging.

5.8 Impact on Indian packaging exports

Transport packaging of exports to developed countries from India will certainly be affected by the stringent requirements in these nations. Lack of information about the packaging requirements as well the ability of recycling industries about imported packages is a major problem. This was because recycling capabilities were mostly established based on domestic environmental resource characteristics and did not take into account that of imported packaged items.

Moreover, importers have found problems in locating recycling firms willing to collect jute packaging wastes mainly because of poor economies of scale.

So there is a suggestion to jute producers to consider applying for the Blue Angel lablel. This may raise the price of jute, but reduce recycling costs, and provide greater demand for it in the secondary market.

Secondly, the Govt of India has also taken up an eco-labelling scheme for packaging: Part-I: Paper, paper boards and plastics excluding laminates and Part-II: Laminates and products thereof. These can be useful to manufacturers for adopting environmentally friendly packaging.

5.9 The jute industry in India

The environmental hurdles could not have come at a worse time for the Indian jute industry. Indian exports of jute goods is set to top the Rs 400 crore mark in 1995-96 despite the general sickness in the jute industry.

This means an increase of around 10 per cent over the Rs. 370 crore worth of export income achieved in the previous financial year. The main export items are hessian, sacking, carpet backing, fabric, yarn and diversified products.

During the six-month period between April and September in 1993-94, the total volume of jute goods exported was 1.12 lakh tonnes valued at Rs. 175 crore. In the corresponding period during 1994-95 the quantity came down to 94,000 tonnes valued at Rs. 170 crore. Though the volume had gone down during 1994-95 but the value had considerably gone up in the international market with the improvement in the quality. Besides, yarn export had registered substantial increase.

India had exported 23,000 tonne of yarn during 1993-94 valued at Rs. 31 crore. The current year's target is 30,000 tonne valued at Rs. 60 crore. The yarn was mainly exported to West European countries, Turkey, Egypt and South East Asia.

India had a very good market for hessian in USA followed by Europe, South East Asia, Middle East and Japan. Sacking had a good market in West Europe. However, the biggest market for the item was Africa and Middle East.

In the case of diversified products the export market is gradually showing up. The country's exports of such products hovered between Rs.10 and 12 crore.

Jute experts have suggested immediate assessment of pollution status in jute industry and initiation of measures for effective control of such pollution. During the eighteenth technological conference held in Calcutta on the uses of jute in February, 1995, the Indian Jute Industry Research Association (IJIRA) observed that with the imposition of restrictions on the use of synthetics the jute industry was expected to register fast growth. The production of jute goods is expected to cross 25 lakh tonne and hence environmental problems are likely to follow in a large way.

The categories of pollution in the industry are water, air and sound. Besides, there is the problem of lack of inhouse hygiene. Jute mills, which are located in different parts of Calcutta and neighbouring districts on both sides of the river Hooghly, discharge their effluents into it. Data collected from different locations indicated that the pollution level caused by the industry was not as high as that of other sectors. However, with the growth of the industry, the pollution problem could also become serious.

Regarding air pollution, jute industry damages the air quality on two counts - in house air and air in surrounding locality. The quality of coal used by jute industry also has high ash content.

5.10 Role of International Trade Centre

The International Trade Centre is a body set up jointly by the GATT and the UNCTAD at Geneva to provide assistance to developing countries. In a publication (Packdata-News No.2) it notes:

A lack of basic technical and commercial information on packaging is one of the major constraints to effective packaging developments in most developing countries. This subject is not covered in sufficient depth by existing trade information services, maintained by national trade promotion agencies or similar institutions. Existing abstracts from journals in the packaging field do not cover fully the needs of developing countries, as they are intended mostly to meet the requirements of packaging manufacturers and users in industrialised countries.

To answer the particular needs of developing countries for appropriate information in this field the ITC Export Packaging Sub-Programme has created a computerised information system, with several databases on different aspects of packaging, the most important is PACKDATA.

PACKDATA was launched in 1989 and is now installed in more than 20 countries. This includes India, where it is hosted at the Indian Institute of Packaging, E-2, MIDC Area, Andheri (East), Bombay 400 093.

5.11 Recommendations

Packaging materials is an area where environmental regulations are coming in very frequently. So India's manufacturers should continuously update their database on these new regulations in Europe, the USA and Japan by using the PACKDATA available at the Indian Institute of Packaging. As packaging materials also have an impact on other exported products, it is important for packaging manufacturers and product makers to keep track of the changes in regulations for their own benefit.

References:

1. Toward an Ecological Induction into international trade, Brice Lalonde, Eco-developpment, 3 rue Roquepine 75 008 Paris, France.
2. Techno-market survey on export packaging technologies, Technology Information, Forecasting and Assessment Council, New Delhi.
3. The Emperor's New Clothes, UNCTAD, Geneva.
4. Various publications of the International Trade Centre, UNCTAD/GATT, Geneva