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ENVIRONMENTAL REQUIREMENTS AND INDIA'S EXPORTS: AN IMPACT ANALYSIS

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ENVIRONMENTAL REQUIREMENTS AND INDIA'S EXPORTS: AN IMPACT ANALYSIS*

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Section I

Introduction

The Backgronnd

Environmental measures might erode some of the market access opportunities from trade liberalisation, including the reforms achieved in the Uruguay Round. As a corollary, the comparative advantage of labour-intensive, low-value-added products exported by developing countries, which has been significantly enhanced by the Uruguay Round, should not be allowed to be eroded through environmental and other standards[1].

Environmental measures are often characterized by the use of non-product-related process and production methods (PPMs) which have process implications and are based on value judgement which differ across countries. Such environmental standards enforced in developed country markets are not necessarily the best option for the protection of the environment in developing countries. Standards

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1. UNCTAD. TD/B/WG.6/10, para 134

vary from country to country due to factors such as differences in pollution assimilative capacities, degrees of industrialisation, population densities, social objectives and priorities attached to the environment[2]. Principles 7 and 11 of the Rio Declaration also endorse this. Environmental measures also depend to a significant extent on the use of the "precautionary principle" and on risk-assessment techniques, which may be highly specific to the country making the decision, and may lend themselves to protectionist trade policies.

Developing countries are more vulnerable to the adverse effects of environmental measures on market access and competitiveness. This is because of lack of infrastructural and monitoring facilities, limited technology choices, inadequate access to and relatively more expensive environmentally friendly raw materials or even information. In addition, small and medium enterprises (SMEs) are the predominant exporters and there is an increasing emergence of environmental standards in sectors of export interest to them[3]. They are disadvantaged even with respect to the positive trading opportunities generated by environmental measures, as exploitation of such opportunities requires skill and technology, which they sorely lack. UNCTAD has concluded that developing countries' exports may become vulnerable to external environmental requirements on account of their scale and sectoral composition[4].

Trade measures are not the first best option for meeting global environmental objectives. Sustainable development is a much larger issue, encompassing efficient allocation of global resources, domestic environmental priorities in light of states' contribution to national and global environmental degradation, poverty alleviation, capacity of developing countries and so on. Sustainable development might be achieved by an individual country by safeguarding and enhancing existing market access. Scarce revenues preserved in this way might

2. UNCTAD, Policies and Mechanism for Achieving Sustainable Development, TD/B/1304, para 61, Geneva, 1991.
3. UNCTAD. TD/B/WG.6/10 paras 42-69
4. UNCTAD. TD/B/WG.6/10, para 70

then be requisitioned through domestic policies for environmental protection purposes.

Environmental policies, standards and regulations can have varying impacts on the competitiveness of developing and developed countries. The effects on SMEs are particularly significant, often in sectors that are of particular export interest to developing countries[5].

Studies show that in certain sectors, existing market access is being eroded on account of environmental measures, or environmental measures in the making have the potential to restrict developing countries' access to foreign markets. In the former case, an UNCTAD study[6] points out that about one third of the value of total exports and about one half of the value of manufactured exports of developing countries originate in sectors that are potentially affected by environmental requirements; 60 per cent of manufactured exports of Asian developing countries are so affected[7]. Of particular importance is the impact of environmental measures on SMEs in such countries[8]. UNCTAD has reported that SMEs share half of the total exports in a number of Asian developing countries. In India, the share of SMEs in exports of textiles and leather is about 80 per cent. Further, the potential to expand the share of SMEs in exports is very large in these countries. For example, while SMEs in Bangladesh account for 80 per cent of total exports in a number of sectors, they exported only 4 per cent of their output. Wherever additional investments are required for exports only, because the domestic market does not require such standards, there is an absence of economies of scale[9] and market access is hindered.

Measures such as eco-labeling, packaging, eco-taxes etc. affect market access. Eco-labels freeze technology choices, discourage product development and affect SMEs more than large enterprises,

5. UNCTAD. TD./B/WG.6/L.7, paras 21-23
6. UNCTAD. TD/B/WG.6/10
7. op. cit. Para 47. Also see para 48 and 53.
8. op.cit para 53-61
9. op.cit.paras 63-64

due to difficulties in technological adaptation as well as in information requirements for effective monitoring. The fact that most eco-labels are voluntary does not change the fact that they are de-facto non-tariff barriers affecting exports from developing countries. Similarly, packaging regulations may be based on considerations that go beyond the borders of the importing market.

In addition to the issue of safeguarding existing market access, jurisdictional issues also need to be tackled. Negotiations under the multilateral trading system and panel decisions on these issues have upheld Principle 12 of the Rio Declaration that "unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided[10]. This is also affirmed in Chapter 2 of Agenda 21 of UNCED[11]. Moreover, trade displacement caused by unilateral measures taken pursuant to an MEA is also of concern, particularly to developing countries, and some safeguards against these trade effects should exist within the framework of international trade rules. This has become all the more important on account of the emerging WTO jurisprudence whereby long standing principles like those relating to the concepts of like product, extra-territoriality and extra-jurisdictionality are being gradually diluted.[12]

The use of PPM-based mechanisms needs special safeguards. More transparency or consultations in the process of standard formulation, unless there is an obligation to take such comments into account, would be insufficient in granting market access. All these standards can act as non-tariff barriers to trade because: -

(a) the cost of compliance may be high

(b) the technologies and raw materials required may not be available domestically

10. Trade Rules and Environmental Controversies during the Uruguay Round and Beyond, Peter P. Unimonen (1995). Also see Tuna-Dolphins Panel Report I and II, US Gasoline Panel and Appellate Report etc.
11. See United Nations (1993).
12. See, for example, the Shrimp-turtle case.

(c) they may be totally inappropriate to the conditions of the exporting country.

The notion that income effects are of overwhelming importance in the context of developing countries is borne out by empirical evidence[13]. The above observations apply equally to removing non-tariff barriers in areas where developing countries have comparative advantages. In fact, removing tariff escalation, coupled with other non-tariff barriers, is also likely to restore production in accordance with comparative advantage. According to the Brundtland Commission report, producing in accordance with comparative advantage is much more likely to be environmentally beneficial. There are many developing regions having better environmental absorptive capacities than developed regions for sectors like wood products, fisheries and agriculture. Granting enhanced market access to these regions will not only enhance incomes but also engender balanced environmental protection.

Finally, enhanced market access for developing countries could be provided by phasing-in of environmentally friendly products or packaging from developing countries. An example is the environmentally friendly jute packaging used in India and Bangladesh. Some OECD nations have enacted packing regulations requiring less environmentally friendly packaging than jute only because their consumer are not sufficiently familiar with it and it may be difficult to recycle[14]. When sustainable funds are being set aside in OECD markets for recycling technologies, it should be possible to use some of these funds for recycling jute, and giving encouragement to jute packaging for environmental protection. Similar environmentally friendly products could be identified elsewhere for granting improved market access. Apart from niche-market products, it is necessary to look into additional market access across the board. Solutions to environmental concerns may be found in the larger markets as well.

13. WT/CTE/W/25, dated 22nd March 1996
14. UNCTAD. TD/B/WG.6/Misc.7, para 45.

Section II

The Scope

On a survey of literature and preliminary discussions with Government officials, exporters and other stakeholders, the following environmental requirements were determined to be relevant to the study:

- Capacity related issues
- Charges and Taxes
- Product related standards
- Conformity assessment requirements
- PPM-related requirements including eco-labeling, recycling, take-back obligations, etc.
- Multilateral environmental agreement (MEA) –related obligations
- Voluntary arrangements

During discussions in a Seminar organised by UNCTAD in January 1999, it was observed in that the following may be the more prominent environmental requirements in the Indian context:

- Product-related standards
- PPM-related requirements
- Conformity assessment procedures
- Capacity-related issues.

With this background, standard-setting bodies, export promotion organizations, industry associations and others were

consulted for identifying product sectors and firms to be covered by the study. Some sample firms were interviewed in order to confirm the viability of studying these product sectors and specific products therein. A range was selected, taking into consideration products' potential for market expansion, and supply capacities. Care was taken to narrow down to a representative sample of products having a commonality of environmental and related problems. With these factors in view, the following products were finally selected:

(a) Marine products;

(b) Spices;

(c) Processed foods (peanuts, mango pulp, apple juice and mushrooms);

(d) Tea; and

(e) Dyes and dyestuffs.

Primary information at the firm level was collected mainly for marine products, spices, mango pulp, apples, tea and dyes. Between five and ten observations were collected on each product (in all about 70 observations were collected), and the observations were concentrated in the geographical areas of importance in each case. The information was first solicited through mailed questionnaires. When very few responses were received, the firms that did respond were interviewed on site. For the other firms, the study focuses on secondary information and discussions with Government officials, industry associations, experts and export promotion and standard setting organizations.

A study of packaging requirements, deposit refund systems, take back obligations and voluntary measures affecting market access was undertaken on the basis of secondary information. Voluntary arrangements emerging in recent times, as well as those in the offing, were also studied.

Based on the above information, the study then goes on to

analyze the trade-environment interface for export performance. Improvements at various policy and practice levels are suggested. These include positive measures at national and international levels, and suggestions for trade rule-making at the international level, particularly in the WTO.

Section III

Institutional Framework

1. Domestic

A. Export Import Policy of India

The Export and Import Policy (EXIM Policy) of India is drawn up for a period of five years, with some changes being effected in an annual review in April and some other changes as and when necessary. The current EXIM Policy is applicable for the years 1997-2002. There is a negative list each for exports and imports comprising prohibited, restricted (licensed) and canalized items. India's domestic environmental concerns (health and conservation related) and multilaterally agreed environmental measures (e.g. CITES and Montreal Protocol) are implemented through these lists. There are many export promotion measures built into the EXIM Policy, including the grant of special import licenses for firms having ISO certification. There is a separate chapter on quality, where ISO compliant firms are rewarded and quality complaints are addressed.

Export Promotion Councils and certain (commodity) Boards and (export development) Authorities are given special status in the EXIM Policy. They grant membership to exporters based on which the exporters become eligible to get certain licenses and benefits, like duty free advance licenses for inputs for export production, and the benefit of deemed exports. Other relevant incentives include duty concession on import of capital goods used for export production, duty free imports for 100% export oriented units and units in export processing zones, some fast track mechanisms for import clearances, and additional benefits for export and trading houses showing export performance beyond a certain threshold.

B. Rules and Regulations on Product Standards

The Ministry of Food and Consumer Affairs is the main Government agency dealing with product standards, although each Ministry/Department also has its own system of framing and notifying product standards. State Governments also have their own systems of adoption of standards, notably in the area of weights and measures. For the products under consideration in this paper, the main Rules and Regulations are contained in The Prevention of Food Adulteration Act, The Export Quality Control and Inspection Act and regulations for spice quality. Details on these are given in Annex I. A notable point in product standardization in India is that while the enforcement agencies have systems in place to enforce these rules in domestic units, effective or not, there is little possibility of enforcing them on imported goods. One reason could be that the Indian consumer market was comparatively closed till recently, and very few imported goods came in. With the passage of time, it would be advisable for the concerned agencies to devise systems to enforce these rules on imported goods. Today, the imported goods seem to get even better than national treatment as they are seldom subjected to the same enforcement procedures as the domestic units producing like goods. It is understood that an exercise to review the packaging rules has been initiated by the Ministry of Food and Consumer Affairs in order to apply the same rules to imported goods as are applied to domestic goods.

C. Export Promotion Institutions

The Government has been laying emphasis on export promotion since the late 1960s. One result of this emphasis has been proliferation of Export Promotion Councils and Authorities. Details of these agencies are at Annex II. These agencies have been playing a twofold role for product promotion. The first role has been that of nodal agencies for disbursement of export subsidies, a function that has considerably declined after liberalization and the removal of subsidies like the Cash Compensatory Scheme. The second role has been that of acting as the nodal point for interaction between the Industry and the Government. Some of these agencies, notably the Marine Product

Export Development Authority and the Agriculture Produce Export Development Authority, have been actively involved in implementation of policies relating to product standards, as we shall see in due course.

D. Standard Setting Bodies

The Bureau of Indian Standards (BIS) is the chief Standard Setting body in India. It sets voluntary standards that, when met, indicate the quality of the product. Compliance with the standard is denoted by the use of the "ISI" mark., The BIS is also the guiding organization behind most of the mandatory standards set by Government agencies. Details of BIS and some other relevant standard setting bodies can be found in Annex III. Notably, BIS is also the inquiry point of India under the WTO Agreement on Technical Barriers to Trade.

E. Enforcement Bodies

The Export Inspection Council is the chief enforcement body for exports, and the one relevant to the present paper. Details are at Annex IV.

2. International

A. World Trade Organisation

The General Agreement on Tariffs and Trade (GATT) has been the beacon of the multilateral trading system since 1948. As a result of the Uruguay Round of multilateral trade negotiations, the World Trade Organisation (WTO) came into being in 1994 and came into force on 1/1/1995, subsuming GATT under it. GATT reflected the environmental concerns of the international community through Article XX. This Article allows member countries to deviate from their obligations under the Agreement, *inter alia* in the case of three types of trade measures relevant to the environment. These are measures necessary to protect human, animal or plant life or health; measures relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption; and measures necessary to

secure compliance with laws or regulations not otherwise inconsistent with GATT rules. However, such unilateral measures have to pass a composite trade test. This trade test has three components, viz. no arbitrary discrimination, no unjustifiable discrimination and no disguised trade protection. It is often called the "least trade restrictiveness" test. Jurisprudence has shown that the second of these measures has become the most potent tool for taking GATT-compliant unilateral trade measures pursuant to environmental objectives.

GATT jurisprudence was historically based on the concept of non-discrimination between 'like products'. Thus, two "tuna-dolphin" cases held that so long as the product exported is tuna, exports cannot be restricted because "purse seine" nets are used and as a consequence, more dolphins are trapped in the nets. The Panels carved out a strict "necessity" test for measures taken for protection of human, animal or plant life or health. Similarly, measures taken for conservation of exhaustible natural resources had to be "primarily aimed at" conservation. With the emergence of the WTO, the jurisprudence has evolved beyond these concepts. The "reformulated gasoline" case in 1996 relaxed the latter test; a measure "also relating" to conservation, such as protecting the ambient quality of air over American cities, would pass muster. The "shrimp-turtle" case in 1998 widened the environmental window even further. Now the concept of "like product" seems to have been dropped altogether; a distinction can be made between shrimps harvested using a specific technology or device and those harvested without it. India was a party to this case and won it, but on the basis of the "least-trade restrictiveness" test, specifically on the ground that the US measure amounted to "arbitrary discrimination."

WTO has environmental protection as one of its preambular objectives. It exhorts member countries to conduct their trade relations while keeping in view the optimal use of global resources in accordance with the objective of sustainable development, seeking both to protect and preserve the environment and enhance the means for doing so in a manner consistent with their respective needs and

concerns at different levels of economic development. Many WTO Agreements have environmental concerns built into them.

The Agreement on the application of sanitary and phytosanitary (SPS) measures is an elaboration of GATT rules as they relate to measures necessary to protect human, animal or plant life or health. Under this Agreement, member countries are required to base their SPS measures on scientific principles and refrain from maintaining measures without sufficient scientific evidence. Exceptionally, measures may be taken without sound science provided they are provisionally adopted, additional sound science is sought, and the measure is reviewed within a reasonable time based on risks that non-fulfillment may entail. This provision was tested in three WTO cases in recent times. Broadly speaking, the "precautionary principle" was not allowed to be expanded beyond what is already available in this provision. Also, it was considered essential to consider the risks that non-fulfilment would entail in adjudging the compatibility of the measure with WTO rules. The Agreement encourages harmonisation of SPS measures, and considers the standards set by three international standard setting bodies to be acceptable standards. These are the Codex Alimentarius Commission, the International Office of Epizootics, and the International Plant Protection Convention. Equivalence is encouraged and conformity assessment guidelines are laid down. Special and more favourable treatment provisions exist for developing countries, but in name only.

The Agreement on Technical Barriers to Trade (TBT) allows members to apply standards (both mandatory and voluntary) for protection of human health or safety, animal or plant life or health, or the environment. This Agreement also requires sound science and fulfillment of the least trade restrictiveness test. Even voluntary standards (such as eco-labels) have to follow a code of good practice based on the above principles. Rules are laid down for conformity assessment here also. The Agreement does not consider standards set by any particular international standard-setting organization as acceptable. In practice, however, ISO standards are considered compatible unless certain trade rules and certain jurisprudentially developed practices are not followed in setting them. For example, standards based on non-

product related process and production methods and those differentiating between like products may not be acceptable.

The Agreement on Subsidies and Countervailing Measures (ASCM) allows subsidization to promote adaptation with environmental laws without the fear of countervailability. The doctrine of optimal utilization of resources is indirectly built into the Agreement by rendering subsidies to units in economically disadvantaged regions also non-countervailable. The Agreement on Textiles and Clothing (ATC) also indirectly incorporates this doctrine by seeking removal of quotas. Similarly, the Agreement on Agriculture seeks removal of exports subsidies as well as domestic support measures considered to render agriculture unsustainable. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) allows denial to patents on inventions whose commercial exploitation adversely affect animal, plant life or health or could seriously prejudice the environment.

B. International Standards Organisation (ISO)

ISO is the most important of international standard setting organisations. It is a world federation of 123 national standards bodies, an international non-governmental organization with a majority of its members coming from the public sector. Its core business is the development, approval and promulgation of consensus-based international standards. Unlike the WTO, however, majority rule determines decisions in this organization.

ISO develops standards through 200 technical committees split into about 650 sub-committees and 2000 working groups. It also develops guides for standard setting. In preparing these, ISO interfaces with specific users of standards, including those in the private sector. All its standards and guides are voluntary in nature. However, given its credibility as the most internationally accepted organization, ISO standards have considerable trade effects due to their wide use in international trade. Therefore, those who can afford it, do apply for ISO certification.

ISO certification is a costly process by Indian standards. Certification may cost anything between rupees 100,000 to 500,000,

apart from the cost of maintaining the certificate. While the ISO 9000 series is the general quality certification standard of ISO, there is also an environmental management standard, viz. ISO 14000 series. India has about 5000 ISO 9000 companies. About 100 companies have taken ISO 14000 certification.

C. Codex Alimentarius Commission

The Codex Alimentarius Commission, a UN body, compiles agreed-upon standards, guidelines and other recommendations into the Codex Alimentarius (the Codex Food Code or CFC). The CFC attempts to create harmonised standards. Prior to the SPS Agreement, the CFC could be adopted, applied and/or ignored at the discretion of a government. However, the CFC has now been adopted within the SPS Agreement as the benchmark. Thus, countries not imposing standards higher than CFC standards have the right to seek these standards for their imports. Codex Alimentarius has incorporated the Hazard Analysis Critical Control Point (HACCP) plans and principles as an integral part of the CFC. Volume V of the Food Code sets standards for a number of fish and fish products.

D. HACCP

The Hazard Analysis Critical Control Point (HACCP) system is being increasingly used as a food safety system all over the developed world. Details of the system are at Annex V. HACCP is not the magic bullet that solves all food safety problems. It is, when properly applied, a set of preliminary steps and principles that gives a systematic method for identifying significant hazards and properly applying preventive measures so that food borne hazards are prevented, eliminated or reduced to an acceptable level. With emerging international and national agreement on HACCP principles, their application is intended to create commonality of understanding of the development, implementation and maintenance of a food safety system. Many food processors, for example, require their suppliers to have a HACCP system for production of ingredients that they supply. for the intention is to implement effective, documented systems that eliminate or reduce the likely occurrence of food-borne hazards. Application of

HACCP offers widely understood principles for identifying significant risks and their control.

HACCP does not cover only pathogenic bacteria. In applying HACCP, all food borne hazards are to be considered. There are a number of hazards that can originate during production. Some examples of biological food-borne hazards that can originate during production include Salmonella, Campylobacter jejuni, E. coli, Listeria monocytogenes, Yersinia enterocolitica, Cryptosporidium parvum, and Trichinella; among chemical hazards, pesticides and drugs are the most common.

An important definition in HACCP is for Critical Control Point (CCP), defined as "a point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated, or reduced to an acceptable level." Therefore, if the identified food safety hazards are to be controlled through a HACCP system, there must be a step or steps in production where control can be applied and there must be an associated preventive measure.

It is essential that scientifically documented steps and preventive measures are identified. If this criterion cannot be met, then a HACCP system cannot be developed. A HACCP system can only be developed through proper application of the preliminary steps and principles of HACCP. An essential prerequisite to HACCP is the adoption of Good Manufacturing Practices (GMPs). The biggest problem in HACCP Plans is the lack of true CCPs.

Biological hazards are particularly difficult to deal with. For example, we know that proper heating times and temperatures will kill E.coli; therefore, this can be a CCP. However, at present there is not enough known about the sources and control of E.coli to be able to apply preventive measures.

Thus far, research has not provided for reduction or elimination of pathogens at the preprocessing stage. There are possible interventions that could be considered as preventive measures on which a CCP could be based. However, these interventions need considerable research before they can be applied on a practical basis in a HACCP system for actual production.

Section IV

Environmental Requirements

Environmental measures cover a broad spectrum and include, *inter alia*, charges and taxes for environmental purposes, requirements relating to products including standards and technical regulations, eco-labeling, packaging and recycling requirements. Such measures have significant effects on access, particularly of developing countries, into markets prescribing the measures. Positive effects, or opportunities, are not always easy to exploit and require expertise, technology and resources, which may not always be available to developing countries. Negative effects include expenditures to adapt to new standards, to acquire necessary technology and expertise, and to establish the necessary administrative apparatus required in the receiving country. Acquiring or replacing packaging and other materials that are unavailable in the exporting country present another cost. Such negative effects should be mitigated or eliminated altogether for improving developing countries' market access. In fact, ways of providing additional market access to developing countries should be explored.

This section examines the effects of environmental measures on market access for selected Indian products. We study the impact of stringent regulations in the food processing and agro-product sectors in some developed countries on Indian exports, addressing questions regarding not only viability of compliance costs, but also their justification on environmental grounds. We identify some market access barriers related to non-product-related process and production methods (NPR-PPMs) having few transboundary effects, and examine their impact on costs, their effects on the local environment, and the necessity or otherwise of meeting such standards. HAACP standards are specially considered in examining

the above issues and sectors. Both primary and secondary information has been collected for this component.

A. Marine Products

The Indian Seafood Industry and Exports

The Indian Seafood industry is some 45 years old. It started in 1953 with the first shipment of Shrimps to the USA. Until 1960, Indian exports in the fisheries area consisted of mainly dried fish, dried shrimp, shark fins and similar products. Markets were largely confined to neighbouring countries like Sri Lanka, Burma, and Singapore. Around the late 1960s the USA, France, Australia, Canada and Japan stated emerging as important markets for frozen and canned items. Processing plants with modern machinery for freezing and canning sprang up mainly for exports. During the 1980s canned items have slowly disappeared, and frozen items have become predominant.

There are 404 factories registered with the Marine Products Export Development Authority (MPEDA) and over 625 active exporters, of which over 380 are manufacturers/exporters and 245 are merchant exporters. The total installed freezing capacity is around 3 million metric tonnes per annum. The total current production is around 380 thousand metric tonnes per annum. Consequently, the industry's capacity utilization is only around 14%. The factories are located all along the coastal states. 95% of the units are in the small-scale sector. The industry employs over five million people directly and indirectly. These include a highly skilled and competitive work force. Women are predominant in certain processes of the labour force, such as peeling.

Japan is the principal importer of Indian seafood, followed by the EU and the US. Japan's share of Indian seafood exports is 45.8% in value terms. It is followed by the EU (19.2%) and the US (10.6%).

Marine products (fish, shrimp, squid, lobster, crab, etc.) constitute India's largest single agricultural export. Indian exports of marine products stood at US $1123 million in 1996-97 (Directory of Agricultural exports July 1997). The importance of marine exports

to India is substantial. India's share of the total world market is 2.52% (MPEDA). It represents an important potential growth area for the Indian economy, and a source of foreign exchange. Though the industry contributes only 3.4% to India's Foreign exchange earnings, it contributes over 7% of the Net Foreign Exchange Earnings (source: Seafood Manufacturers Association).

Marine exports are nevertheless at some risk, partly because of failure to attain or adhere to international standards. India's marine exports attract automatic detention in the United States. Automatic detention means the product must be sampled and tested before it gains entry into the country, which means delays, storage costs and possibly, a substantial refusal rate. According to estimates, fisheries products detained in the US are valued at US$ 14 million (or 15%), out of total exports of US $ 108.2 million to the country in 1996-97 (source: Chemonics-ACE Project1998).

In August 1997 the European Commission banned fishery products from India. The ban stated that:

- *European Community inspection in India has shown there are serious deficiencies with regard to infrastructure and hygiene in fishery establishments and there is not enough guarantee of the efficiency of the controls by the competent authorities.*
- *There is a potentially high risk for public health with regard to the production and processing of fisheries products in this country.*
- *The results of checks of the community border inspection ports on fishery products imported from India have indicated that these products may be contaminated by micro-organisms which may constitute a hazard to human health.*
- *Import of fishery products from India must therefore not be further allowed.*

The Indian Government, faced with the EC ban, issued an Order dated 21st August 1995 that specified elaborate process standards, because, *inter alia*, "it is necessary to maintain the highest quality standards as per the health requirements of the importing

countries that would encompass the standards like unified directive No. 91/493/EEC dated 22nd July 1991 of the European Community ...". As a result of the EC ban on Indian fisheries products, and as a condition for the partial lifting of that ban, certain seafood processing plants and freezer vessels have been re inspected and approved for exporting to the EC countries. Currently, about 90 out of 404 plants in the country are approved for export of fishery products to the EC.

European standards are higher than the HACCP standards discussed above. The Seafood Exporters Association of India claims to have spent US$ 25 million on upgradation of their facilities to meet the regulations. Appropriate training of the personnel involved in various stages of production and processing also need to be addressed. Many of the standards adopted in the Order dated 21st August 1995 are either not relevant for the product quality or are too stringent given Indian fishing conditions. The legitimate objective, if any, of the standards could be met through less cumbersome and less costly procedures. Some examples of the Standards applied through this Order, which clearly exceed HACCP standards, are given below:

- Fishes/Fillets of uniform size and colour shall be packed together.
- The (shrimp) can exterior shall be free from major dents, rust and seam distortions.
- 'Potable water' means water used for processing which means tolerance levels as per EEC Directive No. 80/778-EEC.
- Sufficient supply of potable water ... shall be provided.
- Non-slip floor that is easy to clean ... structures and fixtures must have limber holds that are large enough not to be obstructed... Walls and ceilings that are easy to clean ....
- Adequate ventilation ... proper vapour extraction ...
- Adequate lighting
- The immediate approaches of the processing areas shall be concreted or tarred or tufted to prevent wind blown dust.

- The layout of different sections shall be in such a way as to facilitate the smooth and orderly flow of work to prevent possible cross contamination.
- The floor of the food handling and cold room areas shall be waterproof.
- Walls shall be free from projection and all pipes and cables shall be neatly covered. Junctions shall be rounded off ...
- All windowsills shall be sloping inwards.
- An anteroom should be provided to the cold rooms/storage.
- Potable water or clean sea water shall be used for all purposes.
- Staff must wear clean working clotbes with headgear, which completely covers the hair.
- When recruited, any person working on and handling fishery products shall be required to prove, by a medical certificate, that there is no impediment to such employment.

The EC-approved plants are normally bigger plants with capacity of more than 10 tonnes per day. Before entering the plant, one must exchange one's shoes for rubber boots, and put on a hair cover, facemask and gown.

Each plant has a chilling room with a temperature of -28 degree C. These factories are spotless with excellent facilities. EC-approved plants are as good as, and in some cases better than, any plant in Europe or the USA. The floors are marble and spotlessly clean, the equipment is stainless steel, the temperature is very comfortable, workers are in uniform, there is enough space to work comfortably, and water is provided for periodic cleaning of hands and raw materials. There are in-house peeling facilities. Every effort is made to re-ice the shrimp, or to put them in the freezer in brine, between steps in processing. The workers are similarly garbed, and while the women de-heading the shrimp do not wear gloves (because they are too easily punctured), chlorine baths are always within reach for hand dipping. There are more than adequate changing, rest and washroom facilities for workers.

The plants have proper record keeping, and clean, well-equipped microbiological laboratories. A microbiologist staffing one such facility and consulted for this study, said regular checks of the incoming material and finished products are undertaken. According to her, the most common occurrence is presence of coliform bacteria, but salmonella is rarely found. Because the first step is to wash the shrimps in cold brine, contamination is removed. There are some 84 processing units like this in the country, out of a total of 404. Just to be sure, microbiological tests are also done at external laboratories for confirmation of results.

A second type of unit includes those that have applied for EC approval. These are the units exporting to the EU before the ban came into effect, and now exporting to the US, Japan and other places. These units also have facilities of a good standard. They lack marble floors. Polythene is provided for shoe and head covering. The change rooms and laboratories are not luxurious, but are designed for good hygiene. They are also equipped with laboratories. They have all the features required by the HACCP manual, but may be of a lesser standard than the EC norms. Their main handicap is infrastructure; for example, while they may lack change rooms of the size required by the EU, hygienic standards are not compromised.

The third type is typically run by small companies with annual turnover of around Rs.2 crore. These are small structures. They do not have in-house peeling facilities, and get peeling done from outside. They do have laboratories, but few are functional. They are inferior to EC-approved units. They have plenty of water and cleaning facilities. The hygiene conditions are apparently not bad, but the scope for contamination is quite high. These companies are exporting to China, etc.

The exporters surveyed said that the concept of standards is good, but its adoption in totality for a developing country is rather difficult. For example, while potable water is in short supply in the Cochin area, the EU standards require that even floors and ceilings should be washed by potable water. There is also a social angle,

namely that the neighbours of facilities do not have enough water even for drinking. It is not easy to use 100,000 litres of water every day without attracting their resentment. The units, of course, often have their own treatment plants for potable water. They feel that EU norms are too strict, and in some cases, irrelevant for product safety. They have been asked to follow norms that even European plants do not follow. In this sense, double standards apply. For example, 62 tests are required to check water standards. For some of these tests, the equipment does not exist in India.

Adherence to these norms also increases the cost of production. Earlier production was mainly in bulk; the equipment required was plate freezers, refrigeration equipment, and facilities for processing and cold storage. But the EU requirement of infrastructure to meet standards involves heavy investment in equipment and buildings apart from operating costs. It is now necessary for each factory to have a potable water system, continuous power supply (standby generators), effluent treatment plants (ETPs), flake ice machines, chill rooms and laboratories. It is estimated that such upgradation involves an expenditure of rupees 1 to 2 crore per unit as a fixed cost. The banks are not willing to give loans. They want to see the performance for the last three years. The last few years were bad because of the EU ban on exports from India. When a loan is granted the cost, at 18% interest plus other running costs, is prohibitive.

As far as ongoing costs are concerned, overhead costs for a medium sized plant can increase total costs by as much as 5 times. In one of the sample cases, the processing cost has gone up from Rs. 2 per kg. to Rs.7 per Kg.

A crude breakdown of the increased compliance cost is:

I) The number of records to be maintained per day has gone up to 160. Earlier only 2 people were employed as record keepers; now there are 16. On an average salary of Rs.2000 per month, the wage for record keepers alone has reached Rs. 28000 per month.

2) The number of operators has increased from 8 to 16 because of additional machines like ETPs, chilled rooms, flake ice machines, etc.

3) Earlier, peeling was done on contract by outsiders at Rs. 1 per kg. Since EU enforces in-house peeling, the cost has gone up from Rs. 1 to Rs.7 per kg.

4) Water consumption has increased 5 times.

5) Power consumption has increased 3 times.

6) Overall, general overheads have increased because of better quality staff, equipment, dress, etc.

According to exporters and confirmed by MPEDA, the compliance cost for meeting the EC norms is 15%-40% of the FOB value. The cost is more for existing units. According to MPEDA, about two-thirds of the units will ultimately upgrade themselves to the EC norms, while the rest will perish. This may result in some unemployment and social tensions.

Another problem is that coastal fishing has virtually reached its saturation point. Any further growth may not be sustainable. Exporters are pleading for permission to shift to deep-sea fishing. However, Government studies have found that the fragile marine ecosystem in areas where shrimp is found would be disturbed. So permission is no longer being given for deep-sea fishing. These trends further affect exporters, in addition to the problems they face in meeting the EC norms. The ire against the EC norms is accentuated, particularly because exporters find many of the details neither necessary nor implementable. Conducting 62 tests on the water to be used to process fishes is a standard they do not consider justifiable on the ground of hygiene alone. Similarly, they find the specifications for the size of washrooms, etc. unnecessary.

AQUACULTURE

In view of the sustainability issues about shrimp harvested from the sea, there has been a gradual shift to aquaculture in India. This shift was assisted by MPEDA by providing technical assistance beginning in 1977-78. As a consequence, export of cultured shrimp in total export of shrimp has moved up to 42.9% in quantity terms and 66.4% in value terms by the year 1997-98. The total area under shrimp farming at the end of 1997-98 is estimated to be 141,591 hectares. Of this, more than 50,000 hectares are under traditional shrimp farming practices in the states of Kerala, West Bengal and Karnataka. The rest is scientific farming with the active assistance of MPEDA. The potential area for shrimp farming along the coast in India is estimated to be 1.2 million hectares, of which only about 10% is currently being utilized. There is therefore a lot of scope for improving the production.

Environmental issues have emerged in aquaculture also, but these are domestic environmental concerns rather than international sustainability issues. The concerns have arisen in view of reports of ecological and environmental effects of aquaculture in South East Asian countries. Experts, however, observe that the concerns are misplaced so far as India is concerned. According to them, the apprehension that shrimp farming causes degradation of coastal zones is vague and baseless. In fact, setting up fish farms in the coastal zone has helped in protecting the zone as most of these units have taken care to construct proper bunding with granite on the outer area facing the sea coast. In a way, these farms protect coastal zones against sea-erosion during the monsoon. Aquaculture units are set up in fallow areas where land is inundated with saline or brackish water and the units do not encroach upon the traditional fishing or farming zones.

Concerns were also raised about the acute shortage of drinking water in the coastal areas, and the suspicion that aquaculture could have contributed to it. But as per the report

submitted by the National Environmental Engineering Research Institute (NEERI) to MPEDA after a detailed study and analysis, "there is no seepage of drinking water wells because of shrimp farms, as the shrimp farms mostly remain in hard clayey soil and the seepage is almost nil or in its minimum percentage".

The NEERI study also found that salinity did not change outside a distance of 25 metres of the fish farm. Deterioration of ground water quality was not observed around the pond sides. Even so, MPEDA promotes the setting up of a buffer zone, concept as per the requirements of the site conditions.

Unlike Taiwan, the Philippines, etc., India does not use ground water for aquaculture.

Effluents from shrimp farms are biodegradable. However, intensive culture systems aimed at intensive levels of production could have pollutants in the form of heavy metals (e.g. mercury, cadmium), pesticides and petroleum products. The Government of Orissa has banned aquaculture around the Chilka Lake because of this. The solution to this problem is to discourage intensive culture systems. MPEDA recommends a farming system that is sustainable in its technical assistance programmes.

In fact, aquaculture provides an environmental "win-win" in coastal Kerala, where rice and shrimp crops can be rotated on the same land. In fact, this has been the traditional practice in that area. Aquaculture cannot be done during the monsoon, and takes only three to four months. On the other hand, rice can be grown only during the monsoon. It is a fact that aquaculture farmers have purchased land at premium from traditional agriculture farmers, and to that extent there is a shift from agriculture. This should be checked, at least in the interior region, and can be done by the states concerned through the state's Land Utilization Act.

The environmental issues for aquaculture are in fact of a different kind. For example, degradation of aquaculture land due to pesticide residues discharged from agriculture land threatens

aquaculture activity. Effluents from industrial belts along the coast may also contribute to the degradation. Because fish cannot survive in polluted water, policy makers should ascertain which areas need corrective measures by looking at the acquaculture units in the area.

The costs for acquaculture were ascertained. Capital costs per unit of 180 hectares amounts to Rs.180,000. Other costs include power (Rs.20 per kg), feed (Rs.70 per kg), watch and ward (Rs.10 per kg), interest on loan (Rs.60 per kg) and misc. (Rs.20 per kg). On the other hand, the returns are Rs.280, 000 per 180 hectare farm or Rs.300 per kg. Clearly it is a profitable business and can provide a lot of employment (650 person-days per hectare as compared to 50 person-days in traditional farming). In Orissa, exporters claim that the 8% state government sales tax is a burden, which cannot be recovered even for exports, and renders them less competitive in export markets.

B. Indian Spices

History and Current Trends

India has been an exporter of spices since the beginning of civilization. The country now dominates the global market for spices. Of the total world imports of 450,000 tonnees, India's share alone is one third, with export value exceeding 340 million dollars (Annex III). Total world trade in spices amounts to just one fifth of the Indian production. India produces over 60 varieties of spices including: pepper, cardamom, ginger, turmeric, chilies, garlic and several seed spices like coriander, cumin, celery, fennel and fenugreek.

For many years Indian exports consisted mainly of bulk-packaged raw spices. Now with changing market trends and consumer preferences, the focus has shifted to a variety of valued added, ready to cook consumer-packed products. Ground spices, blended spices, curry mixes and natural food colors are some of the newer exports. Spice oils and oleoresins are now an Indian specialty.

The essential constitutions of spices, which provide the aroma,

flavour, pungency and colour, make up a very small part, often less then 10%, of the weight of the whole. The balance of the spice mainly functions as the Inter matrix and protective sheath for these essential ingredients. The essential ingredients may be obtained by solvent extraction, resulting in an extract called the spice oleoresin. The volatile constituents of the spice known as the essential oil, are part of the oleoresin, but may also be obtained directly from the raw spice by steam distillation. These spice oil and oleoresins have many advantages over raw spices; particularly in being free of contamination and of high anti-bacterial quality.

The Spice Board recognizes the international trend towards cleaner, hygienic and wholesome spices. It also recognizes that regulatory authorities in many countries have clamped down stricter regulations on imported food. The Spice Board has spearheaded an all out campaign for excellence in Indian spices, involving all segments of the industry. The Spice Board regularly runs quality surveys on spices at all operational levels – farmers, traders, processors, packers and exporters. The crops covered are pepper, ginger, turmeric, chilies, fennel and cumin. The states of Kerala, Tamil Nadu, Andhra Pradesh, Maharastra, Gujarat and Rajasthan have been brought under the survey.

One plant visited was a large, 6 floor, modern plant on several acres of company land in their spice enclave, where chilies were being processed. This plant meets all HACCP and Codex Sanitation requirements. It is comparable to spice processing plants anywhere in the world. The company is old and big enough to have long term relationships with its farmers, and the incoming spice is required to be of high quality. The raw spice is stored in a separate building and fumigated to kill any insects before it is allowed entry into the plant. There are five floors of machinery to wash, agitate, crush, cut, sterilize and powder spices. One machine blows air through the cut up chilies to remove extraneous matter and small stones; even the best products need this treatment. It was learnt that aflatoxin contamination was a recurrent problem with chilies that had to be continually monitored.

Small-scale production with many farmers, brokers and

processors is likely to face the most problems. Unlike the case in developed countries where the bulk of agricultural production is large-scale and handled by a few people using large machines, India's agricultural system is based on many small farmers or fishermen using less sophisticated technology.

In the spice industry, for example, there are few pepper plantations. Small producers have arrangements with large-scale processors who purchase their entire crop. The processor has good control over the quality of the raw material he uses and the large-scale producer who controls all his labour can readily produce a uniform product. There is at most only a single broker involved. The processor usually has a contract directly with the importer and this agreement is periodically renewed so that a long term trust and relationship is established. But such large producers account for only about 5% of the pepper crop; the rest come from mostly small farms.

The typical farmer will plant a little pepper, a little cardamom or some chilies, etc., along with his other crops. He will sell these crops to village merchants and they in turn will sell it to town dealers and brokers. A processor or producer-processor (depending on the spice) will eventually purchase the combined lots. The final lot of spices that comes to the processor may be the product of dozens of lots of varying quality from as many different farms.

There is an inherent chance of contamination in such a process. Given a large number of farmers, the combined lot can get contaminated even if all of them have fairly good quality control. For example, if each farmer is 90% efficient in avoiding contamination, combining 7 independent lots from 7 such farmers is more than likely to be contaminated (0.9=0.478) then a single farmer's lot. If the farmers are 80% efficient, it only takes four such lots to increase the chances of contaminating the combined lot to greater than 50% (0.8 = 0.41).

A prominent exporter of spices narrated an interesting episode concerning rat droppings. Black pepper and rat droppings are of the same colour and size; their separation becomes very difficult. The sieves normally used for clearing black pepper of waste debris did

not help and complaints continued for a while. A clever employee realized that the shape of rat droppings (oblong) is different from black pepper (round). So a special sieve and a special skill in stirring the pepper did the trick. The rat droppings fell down and the unadulterated pepper remained on the sieve. The message was spread and quality complaints were contained.

Different quality standards for export and domestic products add to the problems. The majority of India's spice crop is sold domestically. There are no spice rules for domestic crops, and no mandatory inspections. The quality control for domestic spices is strictly voluntary, but forward-looking agencies like the Spice Board are attempting to educate consumers in India to the value of quality spices. Similarly, firms marketing branded spices are quite quality conscious. A logo is being introduced that will be seen on the labels of spices produced by processors that have earned Spice Board Certificates. (The presence of two quality standards, one for domestic crops and one for exports, however creates a dilemma for the farmer.)

Currently there is little, if any, price differential between domestic and export spice prices. The farmer is left to wonder why he should bother with sanitation, cleanliness and the controlled use of pesticides when he has to pay for it out of his own money, and can expect little or no return for his efforts. There is really no incentive for the farmer to comply with the sanitation efforts except his own conscience. And in many cases he is not trained or educated to be aware of the benefits of sanitation to his customers. He has been handling spice in the same way for generations.

Lack of awareness of the impact of globalization on trade at the level of the small producer is the next problem. Regulatory and development agencies are aware of the challenges of global trade. . Regulators in Delhi, probably most Export Inspection Agency (EIA) personnel in the country, and most food processors are also well-informed. HACCP is known, if not yet practiced, throughout the country. There are training courses on HACCP by various industry associations, the Agricultural and Processed Food Export Development Authority (APEDA), and the Food and Agriculture Organization (FAO) trains trainers in courses throughout India.

The problem is that this awareness has not yet been transmitted to the small producers. They need to be informed of the benefits of complying with the stricter food handling and food pre-processing standards. If the small producers can be made to realize how changing their practices will help them in their businesses, they will be receptive. This is the message from experts who have seen similar situations in Indian agriculture in earlier times for different products. The conversion of India's grain agriculture to better and more productive varieties through the farmer's use of better seeds is a case in point. It is not impossible to gain farmer's acceptance for an agricultural practice if it can be seen to improve yields or price acceptance in the market place. But such incentives need to be provided and explained.

In the context of standards, it is evident that education at the grassroots level has to be facilitated. This is because the food regulatory system in India is a very weak link in the food control system. While individual companies and possibly some food product industries can produce export-worthy products, it is very hard to argue that the current regulatory system can be relied upon to assure of equivalence.

The "equivalence" guidelines of many countries require a comparison of the entire regulatory infrastructure between countries. This includes a comparison of the national food safety laws, the standard setting, inspection, laboratory, enforcement and internal monitoring infrastructure. Food safety law must prohibit the introduction of adulterated food into commerce; it must establish what constitutes adulteration and misbranding; it must authorize national regulatory agencies with the power to set standards, conduct inspections and take enforcement action. This requirement assumes that there is only one standard both for exported and domestic food. It does not contemplate the situation in India, where the standard and regulatory agencies are different for imported and domestic food.

The agencies governing the safety of exports should be identify existing and potential health problems associated with food, and

establish scientifically-based processing requirements and guidelines. Through the EIA and the export promotion bodies (e.g. MPEDA and the Spices Board), India does a reasonably good job in this area and should be able to meet this requirement. The inspection infrastructure should be made capable through training and experience to conduct mandatory inspections of commercial entities that prepare, pack and handle food.

Not only is this area seriously undermanned at present, but there is also a question about the credibility of the system. Evidently, certificates of inspection can be purchased without much difficulty. It is not clear what fraction of export consignments is being inspected, but it is certain that many are not inspected effectively.

Laboratories must be capable of analyzing samples to determine the presence and quality of adulterants likely to affect food, including pathogens, toxins, chemicals and parasites. Only three government laboratories and none of the private government approved laboratories were visited, but there is a case for enhancing the capacity of the laboratories. The few laboratories were generally adequate, but did not have the state of the art equipment required, for example, to test for adulterants at the scale of parts per billion. The system of private accredited laboratories may be better than the under funded government laboratories that operate under the Prevention of Food Adulteration Act (PFA) to examine domestic food samples.

Enforcement personnel must be capable of reviewing findings from inspections, and making rapid determinations as to whether regulatory action is necessary. Where regulatory action is necessary the enforcement arm should have available to it a range of actions designed to remove infringing products from distribution and prevent a recurrence of the problem. On paper the enforcement authority in India appears adequate, but its implementation is poor. Sanitation rules are not consistently enforced; it also appears that HACCP controls are not being applied in all facilities.

India needs to face this challenge and improve the safety of its exports. But this will not be an easy task. India may have to explore whether a possible decrease in her exports, due to the

failure to obtain an equivalence agreement, can be avoided. One possible way is to tighten control over the export of infringing products, by cracking down on exporters who ship such products. These exporters destroy the reputation of other producers and shippers, thus making it tougher to gain entry into the western market. The Indian export-import policy includes a chapter on quality where complaints of this nature can be dealt with; appropriate mechanisms should be developed and implemented, to ensure confidence that quality will be monitored.

Another potential solution is to establish associations of food producers in certain industries that are sanctioned by the government to assure the quality and safety of their products. It could be easier to gain control over product quality and safety in specif. industries if the industry is involved. It is the exporters' business that is being harmed; this fact alone should supply sufficient motivation.

Last but not least, an intensive exercise should be undertaken to study indigenous processes and their effectiveness for product quality, safety and standards, and the process standards 'imported' for adoption here should be tested against these standards and modified appropriately to apply domestically. Thereafter, if the exporters face market access problems, 'equivalence' should be negotiated with the trading partner(s) in that market.

C. Processed Foods

An initial study of the fresh fruit sector was attempted, by looking at a large grape unit. It had an export of Rs.10 crore of which 90% went to the UK. The unit operator said he felt discriminated against, as compared to exporters from some other countries. The duty in Europe for India is 18%, for Chile 3%, and South Africa 0%. In addition to in-house tests conducted by the exporter, importers conduct a survey or test costing US$300, before accepting each consignment. In cases where the importer is unhappy with the results (and this operator suspects an uneven application of the test), the importer may either reject the consignment, or accept it but ask for heavy price discounts. The exporter is compelled to agree, as the goods are perishable.

The exporter pointed out many capacity problems. First, he has difficulty getting market information, and government authorities are of no help in this regard. He could not even find out, for example, the weather in Chile or how much is produced there. He learnt that foreign governments assist his competitors in negotiating good prices with shipping companies for bulk exports. In India, there is no such facility and freight becomes a competitive disadvantage. The only incentive available from the government is the packaging incentive. However, the government has put a ceiling of Rs. 100,000 per company on this incentive. This discourages producers from growing into large companies. In any case, Indian grapes fetch lower prices than their competitors because of their quality and the fear of pesticide residues.

It was decided to focus on processed foods rather than fresh fruit. Peanuts, mango pulp, apple juice and mushrooms were studied.

a) Peanuts

Peanut exporters feel that foreign markets put non-tariff barriers on their exports of agricultural products in order to sustain their domestic agriculture, which involves higher costs than in India. Exporters also face having to make distress sales when buyers refuse shipments, based on domestic import standards. They feel, therefore, that Indian exporters have to depend on the domestic market or the SAARC region for business sustenance. Their customers have informed them that new, stricter will apply after 31 December, 2000 in foreign markets.

Some of the problems faced by exporters appear to be genuine. For example, they find that different testing procedures and conformity assessment standards are required in different markets. Each test costs Rs.6000. Nobody has informed them of the justification for most of the tests. In fact, the European Union tests exports from Egypt and India, and not exports from the USA and Argentina.

Another problem is that while there is no import duty on 50 kg bags, there is a duty on 5 kg bags. This is because the foreign

markets want to discourage retail consignments. They also face problems regarding genetically modified peanuts. While some years ago, one foreign market encouraged use of GMOs, now another market has asked for an assurance that the peanuts supplied are without GMOs.

A more detailed study was done on the issue of aflatoxin presence in peanuts, as this appeared to be a major threat to peanut exports. The EU Commission in Brussels has specified tolerance limits for aflatoxin contamination in peanuts, and also testing methods. The proposed levels are 10 ppb (5ppb B1) for raw material and 4 ppb (2ppb B1) for consumer ready products. The new proposed sampling plan is similar to the Dutch Code, i.e. the analysis is to be done based on a three-test Dutch code methodology from a randomly drawn 30 kg sample. The new procedure is much more rigorous than is currently in force, as should any of the three tests be found to be over the limit, the lot will be rejected.

This step is unwarranted from the scientific angle (as submitted by various agencies/governments). Laboratory test with small animals such as touts and rats that were fed highly contaminated feed (B1) on a daily basis have concluded that aflatoxin can cause cancer of the liver. But there is no clear evidence to prove that aflatoxins are carcinogenic in humans. This should be viewed against the backdrop of the fact that should a shipment of peanuts be found to contain aflatoxin, this does not mean that all peanuts are contaminated since aflatoxin is concentrated on very few nuts. Statistically, one would expect to find one contaminated nut in a sample of say, 5000 to 10,000 uncontaminated nuts. Experts have concluded that 75% of the lots rejected under the proposed procedure would be below the established tolerance, i.e. 75% of the rejected lots would be uncontaminated material.

Further, the world over, especially the peanut supply origins like Argentina, China, India, South Africa, U.S.A., Vietnam etc. where peanut consumption is very high, nowhere has there been any findings that aflatoxin in peanuts led to increases in cases of liver cancer.

A JECFA report says that aflatoxin contamination of foodstuffs is very low among EU nations, and only a few members of the population suffer from hepatitis B. Considering the estimated risk at 20 ppb, it will be 0.0041 cancer cases per 100,000 population annually. Considering the risk at 10ppb, it will be 0.0039 cancer cases per 100,000 population annually. This shows that the downward adjustment of the standard from 20 ppb to 10 ppb would bring a reduction of the estimated cancer risk only by approximately 2 cancer cases annually per 1 billion people. It seems improbable that there would be any measurable risk differential between the hypothetical standards (20 and 10 ppb) in populations with a low hepatitis B incidence like in the EU countries. And consider the possibility that denial of export market to farmers of a developing country like India could result in starvation deaths in multiples of the estimated harm to life in Europe.

The JECFA had previously recommended that maximum permissible aflatoxin levels should be fixed as low as possible. But now, on the basis of further data, it has modified its recommendation to reducing the intake as far "as is reasonably possible". Further, it should be noted that the JECFA's risk estimates are based on data that made no allowance for the substantial reduction in aflatoxin contamination achieved by mechanical removal of the nut skins and by the use of optical and electronic methods for sorting the nuts. The risk computations are thus based on aflatoxin levels that are no longer applicable. This new data should be taken into account when finally specifying the future EU tolerance limits. For example, the Codex Alimentarius Commission had proposed a maximum limit of 15 ppb.

Sampling Procedure

The proposed sampling plan is similar to the Dutch Code (3x10 kg). The analysis is to be derived from a 3-test Dutch Code methodology from a randomly drawn 30 kg sample. The new procedure is much more rigorous than is currently in force, as should any of the three tests be found to be over the limit, the lot will be rejected.

In the case of bulk raw nuts, the implementation of a regular monitoring policy presents difficulties because the aflatoxin will seldom be evenly distributed throughout a given batch and only a few nuts may be contaminated. For example, the contamination rate is estimated at 1:10,000 for groundnuts (peanuts).

The question is how large the sample should be in order to ensure that the test yields reliable data on the degree of aflatoxin contamination. Opinions differ on this point.

The FAO has recommended testing a single 20 kg sample for aflatoxin content from a batch of between 15 and 24 t. The FAO is of the opinion that this sampling procedure would yield results that are reliable enough to eliminate the risk for the consumer, and that stricter requirements would bring no significant safety measure.

Meanwhile, the EU Commission wants three samples of 10 kg each tested from a batch of between 15 and 24 t. According to the new regulation, the whole shipment will be rejected if only one of the three samples exceeds the tolerance level. It would be far more logical to calculate an average value from all three samples as an end result. On the basis of the risk estimate computed by JECFA, several experts object that the new procedure would mean an unnecessary waste of good product without actually benefiting consumer safety. It is also certain that this practice would lead to adverse effects on prices. The EU regulation is also criticised because it fails to specify how the sampling and testing of the final products circulating in the trade should be performed. Uniform criteria, binding on all EU member states, are also necessary for these products.

The implementation of the EU Commission's proposals would endanger the export of peanuts to the EU member countries. The planned tolerance limits of 2 ppb aflatoxin B1 and 4 ppb total aflatoxin in finished products are so low that they would almost certainly cause insurmountable difficulties and immense costs for production and export to the EU countries. Producers within the

EU itself would also suffer unreasonably from these regulations. While the WHO is proposing a limit of 15 ppb for all aflatoxin, the EU Commission is insisting on an upper limit of 10 ppb for the raw nuts, despite the fact that the aflatoxin content decreases during subsequent processing of peanuts. The latest JECFA study published in June 1997 demonstrates clearly that an increase in the upper limit for all aflatoxin from 10 ppb to 20 ppb would involve a theoretical risk of only two additional cases of liver cancer annually per one billion people.

The European Snack Association's Nut Working Group has already expressed concern about the testing programme and analytical methodologies through CIAA (the European Food and Beverage Association). The American Peanut Council has submitted documents showing significant increase in costs and rejections arising from the use of a multi sample system. In the UK, where approximately one-quarter 25% of the peanuts imported into Europe are consumed, the Ministry of Agriculture has stated that the proposals were more stringent than required by current UK regulations, and could result in unacceptable costs to both industry and enforcement, without any prospect of improved consumer safety. Despite these protests, the revised draft of the sampling plan still recommends a multiple sampling system. It is evident that such a change will have very serious implications for the peanut industry. It is also significant to note that the EU proposal possibly contravenes the GATT/WTO agreement, as it will erect artificial barriers and seriously discriminate against a number of producing countries, particularly third world and developing countries including India. Consider these facts:

- Europe represents 47% of world imports of groundnuts and groundnut products - a value of $1.4 billion.
- Assuming all of Europe moves to a multi-test plan, the increase in cost of testing alone will be $4 million. This does not include re-testing costs in Europe.
- The UK government reported that compliance with the proposed EU directive would average 8% of turnover (£ 3.2 million).

- Exporters will lose the ability to ship goods to an alternate European market. As a consequence, the overall cost of the lot would have to be priced with consideration for recovering the cost of the rejected goods, which must be diverted for crushing, or sold at a significant discount for animal feed.
- Exporters may be forced to absorb the costs for additional cleaning, re-sorting, and blanching of rejected lots of peanuts. The implication for increased costs of doing business in the European market could be more than $200 million, according to JECFA.

Testing Plan Comparison - Cost Implications For Peanuts

Current Single Testing Procedure	*Proposed EU Multi-Testing Procedure*
Average cost per metric tonne:$800	*Average cost per metric tonne:$800*
Cost of testing : $50/lot (Lot = 20 tonnes)	*Cost of testing : $200/lot (Lot = 20 tonnes)*
	Rejection: 30% (Based on experience of USA and Argentine testing under the Dutch Code of Practice)
Final Cost US $ 802/MT	*Final Cost US $ 1157/MT*

** Scientific data has documented that reducing aflatoxin levels for raw material (e.g. from 15 ppb total to 10 ppb total) has little or no effect on the levels of aflatoxin found in the finished product.

** There is no justification for restrictive aflatoxin levels on the basis of consumer protection, given the fact that aflatoxin levels in raw materials can be substantially reduced through processing.

** Introduction of rigorous, expensive import requirements puts undue burden on suppliers, distorting trade: it will limit the

volume and number of origin suppliers who can routinely meet the criteria. This could, quite obviously, result in an artificial trade barrier and the possibility of a WTO action.

** Rigorous testing programmes are extremely difficult to monitor and enforce. If not applied uniformly, both suppliers and importers are at a disadvantage. In a crop year when supplies are short, there may be an effort to manipulate results or encourage alternative import schemes through markets where surveillance may not be as stringent.

** Assuming the need to increase pricing to take the anticipated rejections into account, European importers will be forced to consider the following options:

- Blanch peanuts prior to importation (which adds costs to raw materials and raises issues with regard to splits and shelf-life).
- Move production to a non-EU site, where stringent testing of raw materials is not mandatory, leading to job losses in both the manufacturing sector and ancillary business.

** This stringent system will increase the price of raw material in Europe.

** Lastly, none of the European countries produces peanuts. To bring about such stringent import restrictions on a commodity for which they have to fully depend on other origins, without giving any heed to the suppliers, other experts, the WTO and JECFA, may prove to be more troublesome than effective.

In conclusion, the proposed legislation will be counter-productive both to the buyer as well as the seller, apart from paving the way for numerous problems and bottlenecks for no good reason. In other words, the risk that non-fulfilment would entail is not commensurate with the costs incurred.

b) Mango Pulp

There are only nine major exporters of mango pulp in the country. Sourcing is done primarily from Chittor District of Andhra

Pradesh and Krishnagiri District of Tamil Nadu. Exports of mango pulp in quantity and value terms for the last three years for which figures are available is given in the chart below.

Year	Quantity (MT)	Value (Rs. Lakhs)
1995-96	36023	8461
1996-97	40302	10501
1997-98	45874	12531

The Agricultural and Processed Food Export Development Authority (APEDA) has taken firm export promotion steps for mango pulp. Implementation of HACCP was done by APEDA, with some financial assistance from the Ministry of Food Processing Industries. 12 processing units in Chittor District were taken up in the year 1997-98. Subsequently, 12 units in the Krishnagiri district of Tamil Nadu have been taken. About Rs.3,500,000 have been spent for this so far.

The following were the stages and steps involved in the implementation:

- Identifying improvements in the mango pulp processing units and assisting them in carrying out the same
- Development of entire quality assurance documentation, including HACCP plan and essential ISO 9000 requirements
- Training for personnel of units at three levels:
  - Top Management;
  - Supervisors/chemists/operational staff; and
  - Contractual and other labourers/workers
- Assisting in getting the units certified through the third-party certification body

The compliance costs for implementing HACCP would have been prohibitive, had APEDA not come to their rescue with both

financial and technical assistance. All the participating units have implemented HACCP in the Chittoor District. Five units were assessed and certified by International Standards Certification (ISC) South Asia Pvt. Ltd. during the 1998 mango season. Six units of Chittor District and 6 units of Krishnagiri District were assessed during the 1999 mango season. All of the participating units of Chittoor district have been recommended for certification after the certification audit by the National Sanitation Foundation (NSF). In Krishnagiri District, Quality Assurance Service (Australia) carried out a certification audit of 6 units, and all of these were recommended for certification. Small units have not been able to take benefit of APEDA's efforts. There have been problems in applying HACCP at the farm level because of the nature of farms and practices in India.

The quality norms under the Prevention of Food Adulteration Act (PFA) of India do not fully match with Codex. For example, PFA does not cover rules for the various tests for water as required under Codex. According to some small exporters, HACCP has not been followed in the pulp industry! There is a general awareness about HACCP, but they think it has not been passed as a law so far and they do not have to worry about it yet, especially because there is no consumer insistence in India for such standards. They admit that HACCP will certainly increase market accessibility, but they will have problems in adopting them. Some of the problems pointed out were:

(a) Land holdings of orchards are small and contractors procure the raw material, so it will be impossible to keep records at the field level as required for HACCP. The general age of orchards ranges between 3 – 100 years, so it will be difficult to keep control;

(b) The industry is seasonal (3 months per year) so keeping permanent staff. The cost of training new staff every year is also prohibitive;

(c) Meeting the standards will be more viable for large plants or industrial houses that deal in multiple products, work throughout the year and have their own orchards. But most of the units are small in this sector and HACCP will not suit them;

(d) As far as financial aspect of HACCP compliance is concerned, units that are setting up now, will not have any problem. It does not cost much for new units, but the old units will have to revamp their infrastructure. It is a costly affair; according to rough estimates, HACCP compliance will increase costs by 40%;

(e) Financial institutions do not fund HACCP activity;

(f) The main markets are Gulf countries and they are only interested in cheap prices, not HACCP; and

(g) ISO certification is expensive, costing Rs.1.5 lakhs per audit. The surveillance audit is every six months and costs Rs. 10,000 per person-day.

Another main quality issue for mango pulp is pesticide residueOther quality issues for Indian mango pulp, which is darker brown in color than other varieties, are the poor quality of packaging materials, namely plastic bags, metal tins and drums. Bags are sometimes punctured, tins rust or impart an unpleasant metallic taste, and the tin or drum is often damaged during shipment. The reason for packaging problems is the low quality of packaging materials available in the domestic market. The imported tin is good in quality but adds to costs. According to exporters, they do not have the technology or the technology is costly and they do not have the economies of scale to meet the costs. They feel that packaging should not be considered a health hazard.

Testing is a major problem for these units. There are a number of institutions but they are spread all over the country and quite expensive. CFTRI charges Rs.3000/- per test and SGS charges 0.27% of f.o.b. value of the consignment. Laboratories in India are not equipped with equipment based on new technology required for the complicated tests necessary to comply with HACCP. Foreign health authorities are moving from parts per million (ppm) to parts per billion (ppb). Indian laboratories are not equipped to do these tests. There are differences in test results in India and Europe, due allegedly to methods of testing, rather than to poor quality. One recent

consignment of egg powder was rejected in Germany due to residue. It later passed the test in Spain and was sold there.

In Europe, only "natural food" imports are encouraged i.e. no sugar should be added. Although sugar is a natural product, added sugar attracts an import duty increase of 13% (from 6.5% without sugar to 19.5% with sugar). Sugar is added in Europe because there is a surplus of beet sugar, a subsidized product in Europe. Buyers are interested in buying pulp with sugar, but are dissuaded by the higher duty. All the ex-colonies of France, Portugal and Spain do not pay duty on food items. However, all ex-colonies of UK have to pay duty.

Successful exporters feel that the quality of Indian food has to be monitored for exports, and that APEDA should introduce licensing. Small scale units, they claim, should not be encouraged to export because they are often fly by night operations. Fruit Product Order (FPO) has issued 4,700 licenses for food processing units, out of which twenty-one are large units, 156 are medium, and the rest are small scale. 90% of these units are making mango pulp.

Exporters tend to develop and nurture long-term relationships with buyers. If quality or other problems arise, buyers often help by sorting out the problems at their end. Where customs is a problem, buyers are clearly motivated by their interest in consignments.

Quality becomes a major hurdle when buyers have excess stock, or the prices of the goods have fallen in the international market below the agreed or contracted price. In such cases, exporters sometimes have to accept price discounts, especially because of the perishable nature of the goods.

As the ministry responsible for trade promotion, the Ministry of Commerce takes interest in export operations. But the problems faced by exporters are often quality or health related, where the Health Ministry should be involved. Even in business negotiations, foreigners want an assurance from the Health Ministry, which is not easy to obtain. There is a need to create better policy coherence here. Because the Health Ministry is responsible for the development of

Codex standards, exporters feel that that Ministry could consult producers to their benefit, while attending Codex meetings and formulating domestic standards. Food laws emphasize economic considerations and not safety. The basic thrust of food laws is thus misplaced so far as export promotion is concerned.

c) Apple Juice

There is hardly any export of Juice from India. HPMC is the biggest player in Apple Juice. Juice export is not feasible because of government's price support policy (MIS Scheme). Exporters have to procure for the government on a price higher than market price. There have been on and off exports of apple concentrate to Germany, Italy and the US, but this was done through third parties; no direct exports were reported.

India has a lot of potential in fresh and processed food but it suffers on two accounts:

(a) Productivity is very low. India has one of the lowest productivity of apples in the world, due mainly to lack of advanced technology. India's productivity is 6-8 metric tonnes/hectare compared to world productivity of 30 metric tonnes/hectare. It is. We seem to be reluctant to import technology, especially in agriculture.

(b) State government subsidies act as a disincentive to higher productivity. Subsidies are given on procurement price, fertilizers, water, etc. Subsidies would be better focused on transferring technology from lab to field.

There are two systems of standards: (1) the Prevention of Food Adulteration Act (PFA), and (2) Codex and ISO 9000. The level of tolerance under the PFA is higher than Codex or standards in other countries. For example, the allowable level for heavy metals and radiation content in India is 250 ppm, while in it is 100 ppm. Codex tolerances are even lower.

The estimated use of pesticides is 250 tonnes/year for all crops in Himachal Pradesh. But under PFA there is no testing required, the technology used is outdated and does not give reliable results. India's

production price of apple concentrate is Rs.40 per kg, while the international selling price is Rs. 20-22 per kg. China is the main competitor. We do not know the subsidy structure in China but they give flexible conditions to the buyer (e.g. buy now, pay later).

However, in District Kinnaur of Himachal Pradesh, there is no fertilizer or pesticide use and apples are being grown organically by compulsion. One exporter shipped a trial order of 294 boxes of fresh Kinnaur apples to the UK through Anza Corporation of New Zealand in 1997. He never heard from New Zealand after that. Unfortunately, the apple was not marketed as organic, although actually it was. A better marketing infrastructure would have seen the organic Kinnaur apple targeted at the premium export market.

d) Mushrooms

Background

India produced about 40,000 tonnes of all types of mushrooms in the year 1997, not including the edible wild mushrooms harvested from nature. The marketing of mushrooms harvested from nature is handled by traders/exporters in big cities who collect the mushrooms from the growing areas through local contacts.

There are fourteen large-scale white button mushroom units/ export oriented units located at the following places. Approximate installed production capacity is also shown.

i) Flex India Limited, Dehradun, U.P. - 2000 TPA
ii) Ponds India Limited, Ooty, Tamil Nadu - 4000 TPA
iii) Agro Dutch, Lalru (Ambala), Haryana - 3500 TPA
iv) Trans Chem, Pune, Maharashtra - 3500 TPA
v) Saptrishi Agros, Madras, Tamil Nadu - 3500 TPA
vi) Premier Explosive, Hyderabad, A.P. - 3500 TPA
vii) Sugham Agros, Near Hyderabad, A.P. - 3000 TPA
viii) Vishal Agrotech, Indore, M.P. - 3000 TPA
ix) Zauri Agrotech, Goa - 100 TPA

x) Techtran Agro India, Hyderabad, A.P. - 2000 TPA
xi) Bharati Agritech, Gurgaon, Haryana - 500 TPA
xii) Mandeep Mushrooms, Gurgaon, Haryana - 500 TPA
xiii) Chail Mushrooms, Tanda, Punjab - 500 TPA
xiv) Dinesh Agros, Pune, Maharashtra - 1000 TPA

All the above units are presently in production. Some are selling fresh mushrooms in markets in India, while most of the EOUs are exporting. There are scores of other smaller units growing mushrooms in environment-controlled cropping rooms in various parts of India. Seasonal growers, who produce mostly for local markets, also form a large portion of growers.

The EU and USA are very large producers of mushrooms. They are also the largest importers. The EU production of mushrooms is estimated at about 1 million tonnes and that of USA at about 375,000 tonnes in equivalent-to-fresh form. The imports of mushrooms into USA and EU are estimated at about 84,000 tonnes and 143,000 tonnes respectively in 1996. The major exporting countries to EU have been Bulgaria, Poland, and China. EU has allocated quotas to the mushroom exporting countries to put quantity restrictions on exports to EU at reduced custom duties, ranging from 12% to 23% for mushrooms supplied in various forms. Export into the EU outside the allocated quota attracts heavy duties, to an extent that landed prices increase from an average of US $2.46/kg to US $4.60/kg. With that kind of duty structure outside the quota, it is difficult to export mushrooms to the EU. India does not enjoy a separate quota at present but it has been placed in the residual group with other countries and allocated 4.52% of the total import value, as against 31.25% for China and 59.76% for Poland.

Quotas on mushrooms are an uncorrected vestige of the past, when the agriculture sector was not covered by GATT disciplines. The tariffication process built into the Agreement on Agriculture of the WTO is yet to result in quota free access of mushrooms to EU markets. Multilateral efforts are required to expedite this process. In the meanwhile, India needs to submit a representation to the EU to

have an exclusive quota fixed. The quotas allocated to Poland and other countries have been regularly left under-utilised, to the extent of 21,000 to 22,600 tonnes in the last couple of years. India should make representations to be allowed to fill up the under utilised quota through a separate allocation.

A severe restriction in productivity had been experienced initially by most of the growing units all over the country. Some of the bottlenecks identified during interaction with the industry are elaborated below.

a) **Technology gap:** Mushroom growing in India started with the use of primitive technology for compost making and crop raising in the late sixties and early seventies, resulting in low yields per unit weight of compost. The compost was prepared from cereal straws and animal waste by a long outdoor fermentation process in a single phase, without use of steam pasteurisation. An average mushroom yield (6-8 kg/100 kg of compost) was harvested in 6-8 weeks of cropping, and the crop was raised in makeshift cropping rooms. This was followed by a second phase of activity: a modern mother composting unit was established at Solan with FAO assistance. Compost was prepared using an advanced, two-phase method. A rich substrate was prepared from cereal straws and poultry manure. The compost produced in this way doubled the productivity of mushroom per unit weight of compost, which is considered a big leap for the growing mushroom industry in India.

   With increased exposure of scientists and workers to modern growing methods, and more and more people taking to the profession, the mushroom industry started taking shape.

   Then came the establishment in 1983 of the National Research Centre for Mushrooms, by the Indian Council of Agricultural Research at Solan, H.P. This gave a fillip and encouragement to the industry. Concerted efforts began for popularising the improved methods of cultivation, screening of improved strains for use by Indian seasonal growers, and addition of more mushrooms to the list of cultivated mushrooms in India. The

information on improved technology was still not available to the common grower or entrepreneur in India.

After composting was accomplished by the grower, information on raising a healthy crop of mushrooms was another bottleneck. The grower would collect spawn from some source and not know about the growing parameters, nor was the modern cropping room available to him.

In the late eighties and early nineties, modern cultivation units were established with help from various companies from Europe, whose interest was in selling the machinery. This led to the construction of modern mushroom units, but the question remained who would manage them. At that point, the Indian industry took a beating: unit after unit failed to produce mushrooms to the level of profitability. Some time was taken to tune the production parameters, until economic yields were obtainable by most of the units in India. By the time this was achieved, the international market came crashing down and has not improved.

b) **Role of Govt. institutions:** The research and development (R&D) support available in the country caters more to the needs of small or marginal mushroom growers, both for information and training. The average yield per unit weight of compost has been increased to 16-20 kg/100 kg of compost in 6 weeks of cropping. But for becoming globally competitive, yield increase combined with reduced cultivation costs is the goal.

c) **Exploitation by foreign machinery sellers and consultants**: Foreign machinery sellers supplied machines used in labour starved countries in Europe, on an as-is-where-is basis. In addition to selling the machinery, they also offered the technical know-how for cultivation of white button mushrooms in computer-controlled cropping rooms. They failed to understand that the situation prevailing in temperate Europe is very different from that prevailing in tropical India: while the temperature needs to be increased under European growing conditions, the

opposite is true in India. The job becomes more complicated when you have to manipulate other parameters like air speed, heat removal, and carbon dioxide and oxygen levels in the cropping room. All the above parameters are to be maintained at a certain level during various stages of crop raising.

Also, many raw materials that are used in Europe (for example, peat for casing) are not available in India, and we have to use alternative materials instead. The European grower is used to watering peat casing heavily, which will not apply under Indian conditions. Post harvest handling of fresh mushrooms in temperate areas is easier than in hot climates, where time for post harvest handling.

Foreign machinery sellers offered buy-back arrangements to most of the projects Export Oriented Units (EOU's); in many cases the arrangements turned out to be false guarantees. It became a fashion with financiers in India to ask for a buy-back guarantee from a foreign buyer, which in their opinion was nothing but a ploy to safeguard the interests of the financiers. The real guarantee should have been a clear picture of the domestic and international market. Every project entrepreneur should undertake a market survey on a realistic basis, and then give his projection of the market.

In spite of some negative experiences, India is a big market itself is a big market for future mushroom growers, especially for fresh mushroom marketing.

d) **Varied availability of raw materials in India and lack of information on their optimal utilisation:** The raw materials available in different parts of India for mushroom cultivation are varied. In most of northern and central India, wheat straw is abundantly available, but prices are high. In the eastern and southern parts paddy straw is available in abundance, and at lower prices. Poultry manure is available everywhere at a very low price. Sugarcane bagasse is available in those areas where sugarcane is grown in abundance (Western parts of India, Central India, and some other places). The art of composting from

wheat straw, paddy straw or sugarcane bagasse as base material will have different requirements. Limited information is available to the grower on the use of paddy straw and sugarcane bagasse as base materials for composting. Their optimal economic use for composting requires a specialised skill on the part of the manager/entrepreneur.

Casing is the second important input in button mushroom growing. Although not many casing materials are available for commercial growing in India, it is possible with either Farm Yard Manure (FYM), spent compost or composted coir pith. Each needs to be processed (water leached or steam pasteurised) before use, unlike the peat sold in Europe. (Peat is harvested from underground bogs deep down, is devoid of harmful microorganisms, and needs only a pH adjustment before use.)

The use of FYM, spent compost or composted coir pith in place of peat as a casing (in button mushroom cultivation) will also require experience on the part of the grower.

It remains to be seen whether mushroom productivity using these materials will be possible at competitive prices.

e) **Absence of organised support to mushroom industry for processing and international marketing:** There is no organised help available for marketing mushrooms abroad. Each export-oriented unit has its own arrangement for marketing. Mushrooms are preserved in brine and canned in large containers of 3-5 litres capacity, or even bigger, for export; it would likely be more profitable to sell in smaller units. Government support for mushroom marketing does not exist, nor is any special or preferential European Union quota available, as is available to other nations.

Direct export to the USA or Germany under some arrangement is one alternative that could be considered. For this the growers would have to form a marketing co-operative. There are no processing plants especially available as a support organisation for this industry in India, except for a limited support by National

Agricultural Cooperative Marketing Federation of India NAFED to seasonal growers in the North Western plains. This type of support is available to mushroom growers in China, and they are able to can the produce on a large scale at rail-accessible points. Financing at lower interest rates, and inputs for infrastructure at fair prices, would also help to keep down the cost of cultivation. Reduced production costs, together with greater productivity per unit weight of compost, will help the industry to become competitive globally. A long-term strategy has to be planned to help the industry, including training, development of high yielding strains, better pest management programmes, and efficient post harvest mushroom handling and processing for added value.

Indian mushroom growers face unfriendly foreign tariff and quota, and capacity and technology issues. These problems currently pose more of a challenge than environmental barriers.

D. Tea

Background

Tea is one of India's oldest and most established export items. India accounts for about one-third of the total world tea production. The total tea export in 1998-99 was US $548.11 million, with a growth of 14% as compared to the previous year. The Tea Board is the principle agency for promoting tea exports. Two major research institutes are involved in this area, the Tea Research Association (TRA) in North-East India and the United Planters Association of South India (UPASI) Tea Research Institute in South India. They have their own well-laid out scientific departments for conducting applied fundamental and applied research in tea in the fields of agronomy, soil microbiology, plant breeding, physiology, biochemistry, plant protection, tea machinery, etc. There are about a dozen Government of India tea promotion schemes, ranging from technical assistance to subsidy and finance schemes.

Tea is mostly exported in bulk from India. The benefit of value added in consumer packaging is not available to Indian tea. Two important reasons are the 'brand–consciousness' of the western

consumer, and the highly sophisticated packaging requirements in the sector. Many of the tea estates are owned or run by old and established western firms (mostly British) who have established brands in Europe and the US. They export bulk tea from India, and package and brand it in the consumer markets. Indian tea growers find it easier to send bulk consignments to these firms. Packaging laws, in Europe especially, are too strict for Indian firms. The German Packaging Ordinance and the European Packaging Directive, for example, require sophisticated machinery and skill.

In recent years, there have been increasing reports of pesticide residues in tea. These reports have an effect on market access. For example, Germany complained about high levels of ethion residues in Darjeeling teas. Complaints were also received about high levels of bicofol in Assam, Terai and Booras teas. In addition, the Government has banned the application of DDT, BHC, aldrin, aldrex, endrine, heptachlor, chlordane and tetradifon. Moreover, there are Government guidelines providing that if chemicals such as thjiomton, dimethoate, monocroptos, fenicyphermethrin, fenvalerate, phorat, phosphomodon, formothian, acephate and carboxin are applied during the plucking season, the plucking that immediately follows these sprays should be discarded.

Doubts were raised some time ago about the justification of some of the objections in the European market about pesticide residues. In 1995, the German limit of 0.01 mg of tetradifon and 2 mg of ethion per kg of tea were somewhat arbitrarily imposed because of lack of data from India on its pesticide safety limits for tea. Later, the Teekanne Darjeeling Gold brand of tea was rejected because it contained 0.24 mg of tetrafidon per kg, twenty-four times the limit set by Germany. The rejection was soon followed by a report by the German Institute of Environment Analytics, Messzelle, denouncing the brand as unsafe. On the other hand there were no rejections from the UK. This led some to believe that the German ban was motivated by protectionism. An alternative explanation is that most of the Indian tea firms follow British practices.

The tea estates are largely well managed and employ sufficiently educated people to adhere to these guidelines. The production process

is also sufficiently well oiled to ensure tbe meeting of these standards. However, there is a problem regarding testing and conformity assessment for these standards. Only one institute, the Pesticide Residue Laboratory, can test commercial samples of tea in India.

Another problem is the cost factor. It is reported that the test required to clear a consignment for Germany costs roughly US $234 per analysis. This is unaffordable, at least for the bulk tea exporters who get a much lower realization.

The Tea Research Association now monitors pesticide residues. Exporters apply the ISO 3720 standard. The Indian standards are even more stringent than ISO and all other countries' domestic standards, with the exception of Japan. The best tea is supplied to the UK and Japan, while lower quality tea goes to countries like Russia, Poland, Iran, etc. The stricter EC standards apply to exports to the UK, while for Japan it is enough to get Export Inspection Council (EIC) inspection done.

Non-tariff barriers are still faced by exporters, despite improvements made in recent years. Child labour is a big issue. Buyers visit plantations to ensure that there is no child labour. However, some children may still be helping their parents in the plucking work. Plucking contracts are given on the basis of the quantity plucked, and plucking is not done by regular employees. Families come and do the plucking; the children also help and learn the trade. However, there is no bonded or forced labour. The pesticide issue still raises its head sometimes, and leads to lowering of the price of the consignment, and distress sales as a consequence.

Packaging and recycling regulations in the markets abroad are still a major barrier. Buyers ask the exporters to pay the recycling fees that they pay in their markets. Packaging was earlier done in wooden tea chests costing Rs. 120 for 40 kg. Now, buyers demand multiple-wall paper sacks, imported from Australia, Argentina and USA, and costing Rs 30 for 40 kg., that are suitable for recycling systems in the target markets. In Germany, for example, on some occasions buyers have refused to accept wooden boxes because of higher recycling costs. Unfortunately the shelf life of these paper

sacks is much shorter than the tea chests. As a consequence, exporters cannot keep any inventories and are subject to the vagaries of the market place. For the domestic market, they still use jute bags that cost only Rs. 20 per 40 kg.

For tea destined for Australia, a radiation test requirement was imposed after the Chernobyl mishap, although there is no fear of radiation in the tea production areas. This test can be done only at the Bhaba Atomic Research Corporation (BATC) at Mumbai. Such testing adds to the costs.

E. Dyes and Dyestuff

Background

The dyestuff industry constitutes a major branch of the chemical industry, consisting of various types of dyes and dye intermediates. Dyes have applications in textile, paper, printing, ink, leather, paint, and food industry. The textile industry is the major consumer of dyestuff. The manufacture of dyes began in India with imported intermediates in 1950 in the organized sector, although a beginning had been made in the early 1940s. Most of the production was by firms having collaboration with large western dye manufacturers, starting with the collaboration of Atul Products Limited with American Cyanamid Co. in 1947. Today, the industry comprises about 1000 firms, with only 48 in the large-scale sector. The large-scale firms alone account for 35,000 employees. The total installed capacity of all dye and dye intermediate manufacturers is 54,800 metric tonnes, while the actual production is about 41,000 metric tonnes. The installed capacity for azo dyes is 4,900 metric tonnes while actual production is only about 2,300 metric tonnes.

The dyestuffs industry is concentrated in Maharashtra and Gujarat. In Gujarat, Ahmedabad alone accounts for about 1200 plants followed by Valsad, Vadodara and Surat. Exports of dyes and dyestuff from Ahmedabad alone are Rs. 8,000 million. In Maharashtra, the plants are concentrated in and around Mumbai and Thane.

According to estimates, demand for dyes and intermediates are likely to go up to 60,000 metric tonnes by the next decade. India's export of dyes in 1997-98 was Rs.14,727 million, and of dye

intermediates Rs. 7,553 million, totaling Rs. 22,280 million. Exports in 1998-99 fell by about 10%. The main markets are the USA, the UK, Germany, Korea, Taiwan and Italy. The small-scale sector accounts for about 50% of the total exports of all dyes and intermediates. Exports to Germany have been seriously affected by environmental requirements in the last few years, particularly in the textiles and clothing sector. The study concentrated on these requirements. The focus was on the dye manufacturers in Ahmedabad and a small test survey of textile (handloom) exporters in Panipat in Haryana.

STANDARDS

There are several product-related standards for textiles stipulated in Germany. These are based on a 1994 amendment to the Food and Consumer Goods Ordinance. Prominent among the standards are:

- *A ban on PCP*
- *An obligation to label 'close to skin' products containing more than 0.15% formaldehyde. Textiles containing formaldehyde above 1500 mg/kg must be marked by the declaration 'contains formaldehyde'. The acceptable limits for formaldehyde content have been defined as 300 mg/kg for outer clothing, 75 mg/kg for clothes in direct contact with skin and 20 mg/kg for baby clothing. Alternatives to formaldehyde as glazing agent have been proposed.*
- *All supplies are expected to be free of carcinogenic substances and "acutely toxic" (defined as 200 mg/kg or higher) dye and supplementary material, including organic chlorine and fire resistant chemicals.*
- *Dyes containing benzedine are to be avoided.*
- *No halogenous dyestuffs containing bromide, chloride, fluorine or urea should be used.*
- *Deliveries containing nickel should be clearly marked when the content is higher than 0.5 micrograms. Consumer items coming in contact with skin should be marked 'This product contains nickel'.*

- *Silk should not contain any heavy metal salts.*
- *Accessories and trimmings for garments should be environmentally friendly; buttons and shoulder pads should be made of natural materials.*
- *The contamination of imported natural fibers with pesticides has also been perceived as a problem.*

Discussions with manufacturers in Gujarat showed that laboratories are not equipped with state-of-the-art testing equipment. Some samples have to go to Germany for testing. A standard test costs Rs. 30,000 to 40,000 in Germany, while the local equivalent costs only Rs. 500 to 2000. Exporters calculated that if all the norms laid down by the German laws followed, it would add 7 to 8% to the cost. There is little incentive to follow all the norms, as the exporter does not insist; he is more concerned with the price.

On the other hand, domestic environmental laws have to be followed as a compulsion, and are very strict. Some of the norms in the domestic laws are ridiculous. For example, even air conditioners used domestically will not meet the noise pollution norms. Secondly, it is not technically possible to meet the norm for Total Dissolved Solids (TDS) in the State law, as it requires their complete removal. It is technically possible only to dilute total dissolved solids. Indian norms are even stricter than Japanese domestic norms.

Two years ago, the Government of Gujarat introduced a requirement for an environmental audit for all chemical units. Each audit costs Rs 1.2 million. The Government dug twenty-two wells after a court order to check water quality. None of the wells were found to contain effluents released by chemical units. The dye manufacturers claim that the coloured water found in those wells was due to processing units with no effluent treatment arrangements. There was a request by the small-scale manufacturers to install a common effluent treatment plant, which has not yet been done. On the contrary, the chemical industry was made to pay Rs 120 million to farmers in the area surrounding the wells.

The global requirement of effluent treatment is based on biological oxygen demand (BOD). The Gujarat Government went overboard and put restrictions on chemical oxygen demand (COD) too. Similarly, producers have been asked to dump gypsum in a safe place, adding to their costs. Gypsum is a byproduct and is in demand for desalination, kharland retrieval, and in the cement and gypsum board industries. With these restrictions, economies of scale are less feasible.

To add to the woes of Indian manufacturers, China has become a big competitor. Members of the domestic industry report that most chemical companies in China are government controlled and get huge subsidies for the purchase of base materials used to produce chemicals.

Buyers are not keen on the stringent domestic norms. While buyers often insist that norms for effluent treatment plants (for chlorofluorocarbon (CFC) emissions and solid wastes, for example) are met, their primary consideration is price.

The ban on azo dyes was taken up in more detail for the present study. The German Ordinance regulates putting goods into circulation if they contain azo dyes, which can form one of the twenty identified amines. For example, it stipulates that clothing articles that come in long-term contact with human skin should not use azo dyes that can form the identified amines on cleavage. The Indo-German Export Promotion Project (IGEP) personnel have been disseminating information about these restrictions since 1994, and regularly apprise government as well as industry on the upcoming ban. The Indian government also took some extension of time to meet the criteria being set in Germany. Exports continued in the meanwhile. Then suddenly the ban came into effect and the government went about enforcing it in its own way. The dye manufacturers in Ahmedabad inform that the use of all azo dyes was banned for all textiles. Not only that, the manufacture of these dyes was severely restricted and innumerable difficulties imposed on their production. Germany is still the biggest producer of chemicals. Germany, Japan and Korea still manufacture azo dyes in a big way.

The manufacturers claim that their buyers visit them before placing their orders, and do not insist on any of the numerous restrictions imposed by the State government. The German market for textiles, say manufacturers, is less restrictive than the Indian market. Germany, for example, has amended its azo dyes order by lifting bans on five of the amines that were earlier covered. But the Indian Government continues to restrict all the amines. This has been pointed out to the Ministry of Textiles, but the Ministry has yet to revise its order. Only four of the twenty amines are confirmed carcinogens. The other sixteen were banned as a precaution. A prominent Swiss Institute has conducted studies on these amines and found that many of them have no carcinogenic effects.

Another issue raised was that bans have been imposed on chemicals for which German or other western companies have developed alternatives, some of them patented. Now they want to push those new chemicals in areas where developing countries have a comparative advantage. This has happened in the azo dye sector with pentachlorophenol (PCP). After Western companies had developed Busan 30 as an alternative to PCP, PCP was banned and the Indian leather industry had to purchase Busan at 30 times the cost of PCP.

Ahmedabad Textile Industry Research Association (ATIRA), a premier textile industry research body, is in agreement with most of the problems related by the manufacturers. According to them, the cost of production of azo-free substitutes is 2.5 times the cost of azo dyes. They suggest that the government overhaul the norms to make them realistic. So far, the norms have been concentration based, i.e. what the manufacturer should do to clean the systems and clear the pollutants. They are not based on consideration of the effects on the consumer and the general puhlic. They suggest that sustainable development requires industry to modernize and install on-line systems, and the government to resort to modern systems, like satellite monitoring for isotopes.

ATIRA proposes that manufacturers be trained in sustainable development, and that. NGOs act as watchdogs. They suggest a

vigilant society of private citizens rather than government rules, as government rules are stricter tban required or justified for environmental purposes.

Panipat, a small town in Haryana, is known for its handloom exports. A survey was done there to ascertain the impact of azo dye restrictions on dyeing units. Panipat has about 2000 small dyeing houses, each with an investment of Rs. 0.5 million.

An effluent treatment plant (ETP) for a small dyeing house costs about Rs. 1 million. Obviously, all of the dyeing houses do not have ETPs. They complain that the standards for water coming from ETPs are stricter than the standard for incoming or municipality water, which the town drinks without any outbreaks of illness.

Apart from the cost of the ETP plant, additional costs are incurred due to power requirements, salaries for trained staff and chemical inputs (poly electronite, ferric sulphate, and caustic soda). The cost of dyeing goes up by 15% if an ETP is set up.

Operators realize that cleanliness norms would not have to cost them that much, and harassment by inspectors would likely decrease. The cost of defending themselves against inspectors was put at 4-5% for small units and 0.5-2% for big units.

The best option appears to be a common ETP for the area. It would involve not only money, but also a relocation of the units, which are currently spread all over town.

Buyers visit the handloom manufacturers two to four times a year or even more. It is a niche market, and environmental and labour norms add to their USP, so the manufacturers try to meet the norms in terms of general set up, capacity, plant and machinery, environmental and child labour standards, and general working conditions and cleanliness. Very few buyers ask for ISO 9000 certification, but it helps in marketing to have it.

Many units want ISO certification. The Textile Committee of the Ministry of Textiles helps in the process, but the procedure takes too long. It takes six months to one year, and Rs. 0.2 million to 0.3

million to get the certification. The production is entirely determined by the buyer's choice. If the buyer wants azo free dyeing he gets it, even if the product is not to be used on the body (such as curtains or door mats).

Some operators said azo-free dyeing pushes up the cost by 15 to 20%, while others said it does not make any difference. The process, however, is more difficult for azo-free dyeing. For example, with azo dyes, the cloth needs to be dyed at 60 degrees centigrade, while azo free dyeing needs 100 degrees centigrade. Also, azo dyes have a better range of colours, better colour-fastness and four times the strength. Manufacturers reported that their main problem is the high cost of imported machinery, due partly to import restrictions and the high cost of interest for loans. In addition, some pointed out that testing is sometimes done at the buyer's insistence through SGS rather than in house or from local labs, and that costs 2.5 times more. Some buyers demand better packaging but are also prepared to pay extra. For exports to Japan, a 'needle detector test' is required for which a costly machine is used, rather than simple manual detection.

A study by the Indian Institute of Foreign Trade (IIFT) has listed some items exported to the EU, which have been affected by the azo dyes ban in India. It will be seen that exports of all these items to the EU are substantial.

Code	Item	Share of EU in Indian Exports (%)
42	Articles of leather, saddlery and harness travel goods, handbags, and other leather goods.	65.23
60	Knitted or crocheted fabrics	27.44
61	Articles of apparel and clothing accessories, knitted or crocheted	47.57

62	Articles of apparel and clothing accessories, not knitted or crocheted	39.80
63	Other made up textile articles, sets, worn clothing and textile articles, rags	44.83
63041006	Plastic coated jute bags and sacks	68.85
630533	Sacks/bags of polypropylene/ polythene	46.06
630539	Sacks/bags of other manmade material	64.57
630590	Sacks/bags of other textile materials	24.08

F. Concluding Remarks:

Observations on HACCP:

- Theory and practice are both critical to the successful design and implementation of HACCP.
- HACCP is a prevention process, not a detection process. It may be difficult for some processors to grasp the concept of process control, when the inspection system to this point has been focused on the detection of problems through various tests. But it is a valuable exercise. Microbial testing can be done as one verification step to help assure a HACCP system is working, but by itself it is a not a failsafe tool for use in monitoring or assuring a safe product.
- HACCP is a process and production method; not all its critical control points (CCPs) are necessarily product related. While some CCPs would ensure that the process is safe for the environment in which production takes place, they may not be

relevant to what gets finally incorporated in the product itself. Principle 6 of HACCP is an example at a broad level (see Annex V).

- HACCP can be a profitable proposition for manufacturer and exporters, due to increased market access. HACCP is a process control and can help companies get a better handle on their operations. At the same time, good HACCP systems will improve the quality of product coming out of their plants.
- Since no product can be guaranteed 100 percent safe, HACCP should be considered on the basis that it promises checks and safeguards against safety problems.
- HACCP is a dynamic system, and only good as long as it is maintained. The evolving nature of HACCP means that companies can't introduce the system and let it run by itself. Monitoring and verification are needed.
- In spite of these benefits, HACCP standards were considered an additional cost by many of the respondents. Some even questioned the relevance of some specific elements of the standard to their product or to safety itself.

Conclusions on HACCP:

- HACCP is a good concept and can be cost effective if there are economies of scale at the farm level as well as at the processing level. Of course, HACCP may not be suitable for all products. Mangoes, for example, are available for only two to three months per year, during which exporters have to implement HACCP, including training of workers and conducting certification assessment. As a result, the pressure on the units is immense, particularly because they also have to complete their production schedules in the same period. Perhaps HACCP should be reviewed and adjusted for products like mangoes that have a very short growing season.
- There are additional costs for adoption of HACCP, which would have to be borne by the exporters. Hence, special and differential

treatment provisions of WTO Agreements available for developing countries should be utilized by India not only in seeking time for adoption, but also in getting technical and technological assistance commensurate with India's development, trade and financial needs.

- HACCP creates virtually insurmountable costs for the small and medium scale sector. Application of HACCP to SMEs needs to be preceded by capacity building measures, including national and international technical and technological assistance and non-actionable subsidies.

- Idle capacity, lack of finance, the nature and size of farms, land laws and family traditions, lack of trained staff, and cutthroat competition are some of the hurdles in effective implementation of HACCP.

- Government regulations are focused on economic offences rather than on food safety. This is a disincentive for adoption of HACCP and needs to be reversed.

- A careful analysis is required at the national level on the norms of HACCP that exporters find difficult to adopt, and the Government needs to take these up in the Codex so that the Draft Standard under discussion there can be better adjusted to India's needs. Application of HACCP by importing countries can be suitably discussed at the Government-to-Government level, so that no measures are applied that go beyond the legitimate objectives built into the agreements on technical barriers to trade (TBT) and sanitary and phyto-sanitary standards (SPS).

- The EC regulations on marine products need a closer look to identify their HACCP plus components, the compliance costs arising therefrom and the assistance that could be sought bilaterally and multilaterally to save the SME sector in India, which appears to be dying in the process of complying with domestic standards based on EC regulations.

Conclusions on other environmental requirements

- Capacity-building measures are necessary for most of the environment and health related requirements faced by Indian exporters. While large enterprises and better organized sectors have been able to overcome these requirements through advocacy and efforts (e.g. pesticides in tea, azo dyes in textiles, effluent treatment plants for dye manufacturing units in Gujarat) even they have faced higher compliance costs, resulting in erosion of profits or loss of markets.

- SMEs in particular need capacity support both from the Government and from industry associations, if they are to survive these requirements. Their case also needs to be taken up in multilateral agencies like the WTO, ISO, Codex, etc.

- Solutions for capacity constraints may also involve subsidies or trade related investment measures (TRIMS). Multilateral effort, particularly in the WTO would be required to render such subsidies non-actionable, and such TRIMS compatible with WTO rules.

- Capaeity constraints requiring technical and technological solutions may not be overcome only by government efforts. International cooperation may be necessary in this area. The reviews of the TBT and SPS agreements should factor these constraints into the recommendations for changes or special and differential treatment.

- Capacity building is also necessary to overcome market diversion or distress sales. Exporters need to be advised to shed their fears of market loss and report distress sales to the government, so that environment and health related requirements can be analyzed for possible disguised protectionism. Further, the relevant provisions in and enforcement of the Indian Export-Import Policy need to be strengthened in this regard.

- Standard setting organisations in India need to be strengthened and brought under a common canopy for uniformity. The enquiry points for the TBT and SPS Agreements need to create

institutional support for dissemination of draft standards notified in the WTO, and get exporters' feedback for sending comments to Governments abroad.

- Where standards in India differ from standards in the buyers market, equivalence may be attempted, particularly where harmonization is not possible because of domestic constraints, or where foreign standards are unsuited to local conditions.
- Testing equipment and procedures and possibly, funding of laboratories, need greater attention at the national level. Mutual recognition agreements with important buyers may be necessary and should also be encouraged multilaterally.
- Appropriateness of foreign standards to local conditions need to be assessed at the national level before applying them, as was done in the case of dyes and dye stuffs and the marine product sectors. Social costs should also be factored into this assessment.
- It is important to examine the legitimate objective behind standards applied on India's exports, and to analyse the risk that non-fulfillment may create (consider the cases of marine products, peanuts, and spices discussed above). Such risks should be commensurate with the effort involved to meet the standard as well as the compliance costs. If not, equivalence or MRAs may be the answer.
- Quotas (for example, on mushrooms) and price preferences to competitors are relevant issues for the Government to take up with concemed foreign governments for redressal, particularly where the export of environmentally friendly products could provide India a 'win-win' on environmental and market access gains.
- Voluntary process requirements and other measures like eco-labels can act as de facto barriers to market access, and therefore may have become a necessity in the market place. Wherever significant market access effects are discernible, the matter needs to be taken up multilaterally by the government.

Section V

Voluntary Measures

This section examines the effects of measures relating to packaging materials, product charges, deposit-refund systems and take-back obligations on some export items. The discussion is based on secondary information. Voluntary measures or arrangements, including those emerging in recent times, are analyzed in some sectors.

Labelling

A variety of product-labeling requirements for chemicals and pesticides exist in most countries. These aim to inform consumers of a product's characteristics and cautions. Traditionally, labeling requirements concerned product's impact on health and safety. Only recently has labeling for environmental reasons been developed. The WTO Agreement on Technical Barriers to Trade (TBT) is meant to ensure that standards are not prepared or applied with a view to create unnecessary obstacles to international trade. It applies to both mandatory as well as voluntary standards, which include marking and labeling requirements. The rules apply to products and their process or production methods in so far they are related to product characteristics. On the issue of coverage of non-product related process or production methods (npr-PPMs), it is sometimes said that the jury is still out. However, the negotiating history of the relevant provisions is often quoted to show that npr-PPMs are not covered.

A recent study by Indian Institute of Foreign Trade (IITF) has identified labeling as a barrier to India's exports of certain products. The table below explains.

HS Code	Item	% Share of US in Total Exports
50050000	Yarn spun from silk waste, not for retail sale	3.54
50060000	Silk yarn/yarn spun Cotton Yarn other than swing thread, for retail sale	5.37
53030000	Jute/other textile fibres (not flax, hemp/ramie), raw/ processed	7.73
53040000	Sisal/other textile fibres (genus Agave), raw/processed, not spun	30.60
53050000	Coconut, abaca, ramie, and other vegetable textile fibres	15.38
53070000	Yarn of jute or other textile fibres of heading no.5303	2.16
53080000	Yarn of vegetable textile fibres, paper, yarn	12.12
54010000	Swing thread of man-made filaments	6.23
54020000	Synthetic filament yarn (not swing thread) incl. Synthetic monofilament, not offered for retail sale	3.62
54030000	Artificial filament year (other than sewing thread) incl. Synthetic monofilament, not offered for retail sale	1.66

54060000	Man-made filament year (not sewing thread), for retail sale	2.10
55010000	Synthetic filament tow	11.56
55030000	Synthetic staple fibres, not carded, combed or processed	18.09
55040000	Artificial staple fibres, not carded, combed or processed	16.66
55060000	Synthetic staple fibres, carded/combed/processed for spinning	2.85
55070000	Artificial staple fibres, carded/combed/processed for spinning	2.01
55080000	Sewing threat of man-made staple fibres	0.12
55090000	Yarn of synthetic staple fibres,not offered for retail sale	1.08
55100000	Yarn of artificial staple fibres, not offered for retail sale	0.04
55110000	Yarn of man-made staple fibres, offered for retail sale	0.65

Eco-Labelling

By their very nature, eco-labels contain npr-PPMs, as they are generally based on life cycle analysis. Also, Eco-labels are generally voluntary standards, and are only expected to inform consumers of environmentally friendly choices available to them, and are not meant to restrict market access for products that are not eco-labeled. Since the establishment of the first eco-labeling scheme in Germany in

1978 (Blue Angel), there has been a marked proliferation of eco-labels all over the world. Now there are even regional eco-labels in Europe and elsewhere.

As an example, let us study the Blue Angel. The label is available to domestic and foreign producers alike, provided they comply with the criteria. It has been reported that by 1992, 814 manufacturers had used the label for 3,325 products in 75 categories. No developing country manufacturer is among the users. One reason could be that there are no exports from developing countries in the product categories identified. Another reason could be the lack of information available to developing country exporters. Even if information is available, the process of designing an eco-label is fraught with difficulties for developing country manufacturers. First, serious consultation is done only with domestic producers for designing the label. For example, the Brazilian paper industry encountered problems with Blue Angel because it favoured a percentage of recycled paper in the labeled product, but failed to take into account whether such recycled paper was available to overseas suppliers. Neither did the scheme take into account the benefits to Brazilians of paper manufactured from sustainably managed forests.

One possibility would be to internally harmonize the standard setting procedure for eco-labels. The biggest problem in this regard would be, however, the use of life cycle analysis in designing eco-labels. Different countries and regions have different assimilative capacities, and life cycle analysis would therefore vary in each case. Also, the inputs required for product manufacture may be different depending upon the availability of raw materials. For example, India may like to use jute as an environmentally friendly input, but the same may not be case with a European country. There is, therefore, a likelihood of eco-labels acting as barriers to free trade.

Another possibility is the designing of eco-labels for a given region. For example, the Association of Textile Producers of Germany has proposed two types of labels for textile products, namely MST for consumer products and MUT for intermediate products. These labels are available only to EFTA countries.

The third, and possibly the most feasible alternative is for each country to have its own eco-label based on its own environmental concerns, and life cycle analysis based on its own circumstances and assimilative capacities. Then, all countries where consumer choices are prone to environmental labeling could enter into equivalence agreements with the supplying countries.

India has an eco-label called ECO-MARK, but it is not very successful as it is totally dependent on domestic consumer choice, which in turn tends not to favour environment-friendly products on a large scale. If equivalence is created with European or other eco-labels, for example, it could also create a domestic niche market for eco-labeled products, apart from ensuring that eco-labels abroad do not act as barriers to exports.

EMERGING ECO-LABEL IN THE MARINE PRODUCTS SECTOR

With The Marine Stewardship Council (MSC), Unilever and World Wide Fund for Nature (WWF) have created a quality label for fish caught under sustainable conditions and practices. This is viewed as a major landmark for global fisheries and the future development of agriculture and agribusiness activities as a whole.

This agreement between a powerful multinational corporation (MNC) and an international environmental organization seems to have ignored fishers, however, whose future is at stake in this venture. The evolution of the European market, with its bias in favour of industrial fisheries has been a major factor in the price slump that has affected the welfare of fishermen. With an initiative like the MSC, environmental groups and MNCs may have a decisive influence not only on prices, but also on the conditions that determine access to the market.

The second area of concern is the principles the MSC will draw upon to work out the modalities of such labeling. The United Nations Code of Conduct for Responsible Fisheries primarily emphasizes the environmental aspects of resource management,

not the social aspects. Present European efforts to save resources are based on limiting the number and capacity of vessels, without due consideration for the welfare of fishermen and market conditions.

Will social aspects be included in defining eco-labels? In view of the diversity of fishery traditions and situations around the world, attempts to work out principles at a global level will, by nature, face major problems.

Resource management is a complex matter, and fishermen must be closely and largely involved in the process. Through initiatives like the MSC, a varied, regionalised, participatory approach may be replaced by standardized principles that will apply uniformly to all the seas and oceans, without due attention to specific conditions. Trying to influence fishing practices by introducing new conditions on markets will inevitably lead to a bias in favour of financially sound producers and consumers. The major markets are in Europe, Japan, and the US. Consumers and large producers in these countries will be able to impose their views on responsible fisheries.

Promoting imports to countries whose food requirements are already largely met, while simultaneously refusing to address the needs of less privileged countries, does not really exemplify the principles of sustainable development. If this policy of awarding quality labels to eco-friendly fish is to play a role in promoting responsible fisheries, then there must be wider consultation, with fishermen's participation at the outset of the process. Or, as suggested above, equivalence agreements should be resorted to.

Eco-packaging

Eco-packaging is a general term covering all trends and developments in the packaging industry to provide more environmentally acceptable packaging. The exactitude, however, ends there, due to lack of any general international agreement. The European Packaging Directive (EPD) is one of the most powerful initiatives. It establishes an overall legislative structure for the

treatment of packaging wastes, consisting of quantitative objectives to be achieved over a definite period. For example, the recovery and recycling objective of packaging wastes requires recovery rates of 50%-65%, recycling rates of 25%-45% and a minimum recycling rate of 15% for every type of packaging material. The EPD leaves the judgement on most appropriate means for achieving the objective to member states, resulting in divergence in interpretation and difficulties for market players.

The European Standards Committee (CEN) confers standards through symbols. For example, there are symbols for packaging that can be re-used, packaging that is suitable for recovery, and packaging made of recycled material.

The rationale for the packaging directive is local: OECD statistics indicate that packaging accounts for 20.8% of all waste, 2% of gaseous emissions, 1.5% of water consumption and 3.7% of energy consumption. The directive applies in Europe, but affects all imports to Europe as well. Staggered commitments have been imposed on different member states. On an all EU basis, by 1 January 2001, recovery rates have been set at 50-65%, recycling rates at 25-45% and a minimum recycling rate of 15% for every type of packaging material. However, Greece, Ireland and Portugal are only required to achieve a recovery rate of 25% by 1 January, 2001 and full EU rates by 1 January 2006.

In fact, there are currently no international environmental agreements on packaging. The Montreal Protocol has implications for packaging involving chlorofluorocarbons (CFCs) in manufacturing, but developing countries are exempted from this obligation at present. The Basel Convention on Hazardous Wastes only influences packaging that is hazardous. No such packaging is likely to be used by developing country exporters. Its London guidelines also contain no provisions on how the products concerned are to be packaged. ISO in its Strategic Advisory Group on Environment (SAGE) has a series of recommendations on environment related issues, but it gives no objective guidance to exporters from developing countries on what action they should take to meet

environmental requirements concerning packaging. Clearly, the developing country exporter is left at the mercy of his buyer in the developed world to tell him of tbese regional requirements, and to force him into bulk or distress sales, on account of lack of awareness of those requirements.

Packaging technology has seen tremendous advances in the developed world. Such technology is neither available to manufacturers in developing countries, nor does it fit their economies of scale. The SPS and TBT agreements cast a duty upon the developed countries to make available information and technical and technological assistance to developing countries. No steps seem to be taken in a comprehensive manner under the aegis of the WTO, although some developed country organizations, like CBS of Netherlands, do provide information.

Recycling

A related issue is recycling. Tbe European Packaging and Packaging Waste Directive covers recycling, but the vanguard on recycling regulations is held by Germany. A country of eighty million people (a large number compared to other European countries), it faces a waste avalanche, having to deal with more than 200 million tonnes of garbage and waste every year, about 32 million tonnes from private household alone. Its Ordinance on the Avoidance of Packaging Waste of 1991 is reckoned to be a landmark and based on the 'polluter pays principle'. It does not however, take into account the other environmental principle, 'common but differentiated responsibilities', and effectively creates a barrier for developing countries in the market place.

The German Ordinance gives detailed guidelines. All packaging must either be reused or recycled outside the public waste system. Collection and sorting quotas are prescribed for all packaging items, viz. glass, paper and cardboard, printed material, tinplate, aluminium, and plastics and composites. It provides for equal application to domestic suppliers as well as importers of foreign products. As a rule, the importer does not buy packaged goods from abroad unless he is able to sign a bilateral agreement for disposal, usually amounting

to more costs than would be necessary for the foreign product to comply with its own domestic norms.

The domestic industry of Germany, and Europe in general, has found a way around this problem through the 'green dot' system. The 'green dot' mark indicates that the package can be recycled. An elahorate waste collection system has been organized throughout Germany. Then a 'Dual System' commissions waste disposal companies for supply of containers, bins, bags and collection and sorting of material of value. Producers pay a fee to make use of the 'green dot' and the 'Dual System'.

Almost all packaging can be and is re-used in developing countries, because of low labour costs and the high value of secondary and used materials. The rag pickers in cosmopolitan cities of India are an example of environment friendly systems in place to ensure that the same objectives as the 'green dot' and 'Dual System' are achieved for no additional cost to the producer or the consumer. In addition, these indigenous systems provide employment to thousands who otherwise would be forced into begging or vice.

Commercial pressures have nevertheless encouraged widespread introduction of new packaging technologies and materials. There is pressure on developing countries to buy and use these materials and technologies developed for the industrial world, rather than create a market for existing traditional and environmentally safe practices already in place. A typical example is the inability of the European industry to use jute, an environmentally friendly product, for its packaging needs instead of plastics, which are not biodegradable and hence not environmentally friendly. There have been cases of jute not being accepted as an alternative packaging material in Europe because it is not profitable to introduce it into the 'Dual System".

This is a case of materials that many environmentalists would consider as renewable and environmentally benign, being discouraged in favour of locally produced plastics. As a result, both packaging materials from the developing world, and the products that are exported in them are being disadvantaged because waste recovery

and recycling systems are dedicated to the packaging produced and used in the country concerned.

Deposit refund systems

Deposit refund systems have been mostly employed for reusable glass bottles. So long as there is no market for such products from developing countries, there may not be a problem for India. Even imported bottled products can be recovered through such systems. However, it could cause great difficulties if, as for example recently proposed in one country, wines could be sold in only one colour of returnable glass bottles. Indian wines and Indian beers have recently found good markets in Europe, and could be affected by such a regulation.

Product charges or taxes

These charges are applied uniformly to all products whether imported or locally produced. However, such charges are often applied to selective non-reusable packages, and this category normally includes all imported packaging for a particular product sector. Selective charges or taxes on non-reusable packaging will generally favour locally sourced and packaged products.

Marketable permits

Marketable permits are seen by some as a method of subsidizing environmentally acceptable packages at the expense of others. Parties to the UN Framework Convention on Climate Change, under the Kyoto Protocol, are considering such a systems. It is not known how it would be applied on an international basis, but it is likely to be vulnerable to challenges under WTO rules.

Voluntary Arrangements

Voluntary arrangements are the latest form of environmental consciousness, being shown particularly in the industry of the developed world and particularly in environmentally sensitive industries such as chemicals, paper and energy. In Europe, North America and East Asia, a small group of companies have been experimenting with new ways of producing and selling goods and

services, whereby they could take the initiative of environmental regulation from Government hands and put it squarely in private hands.

One milestone in this regard can be considered the World Business Council for Sustainable Development's (WBCSD) promotion of the concept of 'eco-efficiency'. Johnson & Johnson, Proctor & Gamble, Swissair, Rank Xerox and Thorn-EMI are some companies who have taken up the agenda.

Because these initiatives are in the hands of individual companies, there has been little fear of trade losses thus far, even when the initiatives influence purchasing practices from developing countries. Problems may arise if the trend is converted into Codes of Conduct or Standards.

A private firm generally indulges in environmentally friendly activities that promise to improve the bottom line; otherwise, purely commercial considerations will guide its behaviour. If these trends are sought to be converted into rules with the help of ISO or the International Federation of Organic Agriculture Movement (IFOAM), participation by developing country companies in standard setting would be less likely. The rules formulated would more likely favour the interests of MNCs and other developed country firms.

ANNEX – I

Rules and Regulations on Product Standards

The Prevention of Food Adulteration (PFA) Act regulates food articles intended for domestic consumption within India. Exported articles, including food stuffs, are exempted from the PFA Act and regulated instead by the Export Quality Control and Inspection Act. It authorizes pre-import inspection and quality control for certain "notified commodities." It also prohibits the export of specified notified commodities when the commodities fail to satisfy appropriate quality specifications. The intent of the Act is given in its preamble:

> *"An Act to provide for the sound development of the export trade of India through quality control and inspection and for matters connected therewith."*

The Act (Section 3(1)) authorizes the establishment of the Export Inspection Council, a twenty member governing board, which includes a Chairman and several senior representatives from other Ministry of Commerce agencies. The Act authorizes the establishment of an Export Inspection Agency (EIA) for quality control and inspections and also authorizes the utilization of other agencies for quality control or inspection or both.

It is possible to question whether the emphasis of this Act on product development really results in an adequate inspection system with reference to the safety of the product for consumer use. Clearly a good quality product is likely to be a safe product, and there is nothing in the Act that precludes adequate safety testing. Moreover, specific Orders and Rules under the Act (for example, for fisheries products) specifically mention the main objective of product safety. Still, foreign governments whose food supply is regulated by the

Ministry of Health rather than the Ministry of Commerce may question whether the statutory authority is sufficiently focused on safety to assure the safety of Indian exports.

Food products covered under the Export Quality Control and Inspection Act

Specific "notified commodities" are selected for two basic reasons, (1) because of their substantial importance in international trade, or (2) because of complaints about the quality of the product from importers. There are now well over a thousand notified commodities. Food products covered by the Act consist mainly of selected spices, including black pepper, chilies, cumin seeds, curry powder and other spices. The notified commodity list also includes fish and fishery products, including lobster, prawns, squid and others. Fruits and vegetable products, whether frozen, canned or bottled, including fruit juices and pulp, jams and jellies are also on the notified commodities list.

The coverage certainly appears adequate as far as food items are concerned and there is ample opportunity to enlarge the list as problems arise with specific commodities.

Rules and Standards

The Ministry of Commerce, through the Export Inspection Council has published detailed orders and rules governing the quality control, inspection and monitoring of spices, fisheries products and all of the other notified commodities.

Rules for Fisheries products – The rules for fisheries products called "Export of Fresh, Frozen and processed Fish and Fishery Products, Order and Rules", were published in 1995 after public notice and comment. These rules require quality control, inspection and monitoring prior to export. They specify the type of quality control required, establish specifications for fresh, frozen and processed fish and fishery products. They prohibit the export of such products unless they conform to the applicable specification, and are accompanied by a certificate stating that each unit is approved and monitored by the EIA.

The specifications cover appearance, bacteriological load, organoleptic quality, drained weight and size grade, coding, transportation and storage. In addition to end product quality, the rules specify the manner of holding the product from harvesting to factory processing. There are sections on general hygiene relating to premises, building and equipment. There is a section relating to sanitation and minimum hygiene for factory vessels, and a section giving requirements during and after loading. These specifications are in close accord with Codex requirements. Appendix IX of the Rules discusses the details of HACCP.

Basis of Compliance: It is the primary responsibility of the industry to ensure that the fresh, frozen and processed fishery products intended for export are handled and processed at all stages of production, storage and transport under proper hygienic conditions so as to meet the health requirements laid down under these rules, and that the products conform to the specifications given in the order by the Central Government under section 6 of the Act.

Rules for Spices – As an example of the Rules for spices we consider the Rules for black pepper. These were last updated in a 1991 Notification: Export of Black Pepper (Quality Control and Inspection) Rules, 1991. The Rules stipulate that only a unit approved by EIA can process and pack black pepper for export. These units must satisfy minimum requirements for sanitation, which are specified, and include such details as clean toilets for workers, clean equipment and control of insects. They also specify an open yard for sun drying of spices, cemented and properly covered by netting to prevent the entry of birds. A cement wall around the yard is specified to prevent entrance of rodents. A separate space for storing black pepper is specified, and after garbling, the pepper must be placed in new gunny bags and stored separately away from walls and on wooden drainage. Machines that are designed to remove light particles and extraneous dust shall be properly placed and secured to prevent such materials from being wind blown into stored materials. Finally, a visual examination is required to remove any left over stones and rodent excreta. A special Section of the Rules (Section 4.4) contains several paragraphs on the control of animals, rodents, birds and

pests. In addition to the above requirements, which are designed for growers or pre-processors, there is a Section covering in-process quality control, intended for the final processing and packaging operation (Section 5). This section stipulates that there must be supervision by a competent and qualified technologist with a degree in science or agriculture, and with previous training in courses organized by the EIA. The section also prescribes an equipped laboratory on the site, and guidelines for the acceptance of raw material, processing, packing, preservation and storage.

The approval of the unit by the EIA can be withdrawn by notification in writing if any of these rules are violated or if the equipment or machinery is not in working condition (Section 6.3). Periodic visits to the units are specified under Rule 6.4.1 to check for violations, inspect the records and take samples as necessary to check in EIA laboratories. Under Rule 8 a procedure is established to submit an application to the EIA not less then 7 days prior to loading of the consignment intended for export. On receipt of the application, the EIA shall, within 7 days, issue a certificate declaring the consignment export worthy, or shall communicate its refusal to do so along with the reasons, in writing. Inspection fees are established for consignment inspections and in process quality control inspections (0.4 per cent and 0.2 percent of the FOB value respectively).

It is hard to find faults with these Rules and product specifications for food, spices or fisheries products. They are in full accord with the spirit of US Food and Drug Administration (FDA), EU and CODEX and SPS recommendations. If products were produced, landed, transported, processed and stored according to these specifications there would have been no fisheries ban by the EC, and no detentions by the US FDA. The difficulty is that these provisions are not fully implemented and in some places in India, not fully understood.

ANNEX – II

Export Promotion Institutions

There are 19 Export Promotion Councils (EPCs), 2 Export Development Authorities and 4 Commodity Boards in India. The EPCs mainly promote exports of their constituents, while the Authorities and Boards are also charged with product development duties. The latter are government institutions while the former are industry associations sponsored and partially funded by the government. The Marine Products Export Development Authority (MPEDA), Agriculture Produce Export Development Authority (APEDA), Tea Board and Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council (CHEMEXCIL) are relevant here. EPCs are generally aware of environmental requirements affecting market access of their products, and act as the intermediary between exporters and the Government for getting them addressed. Activities of these institutions in so far as they relate to the subject matter of the study are discussed in greater detail below.

The export promotion bodies relevant for the food and agro sector are the Marine Products Export Development Authority (MPEDA) and the Agricultural Produce Export Development Authority (APEDA). These agencies were given the mission of developing, promoting and improving their respective industries. They act as coordinating agencies with different Central and State government establishments engaged in agricultural and fishery production and allied activities. One of the important activities they conduct is training.

The program for preprocessing workers in the Fisheries Industry is given below. Most of the pre-processing centers in India are in Kerala. MPEDA has organized Extension Training Programs for the last decade. The curriculum for the training program consists of:

(1) Basic knowledge on the aspects of the Indian Fishing Industry;

(2) The Role of MPEDA and export activities;

(3) Hygienic standards at landing center/preprocessing units;

(4) Fundamentals of fish spoilage;

(5) Role of microorganisms in fish spoilage and human illness;

(6) Importance of the maintenance of personal hygiene;

(7) Standards of fishing vessel landing centers and peeling sheds;

(8) Importance of the use of ice water; and

(9) Use of chlorine as a disinfectant.

Another example is the Spices Board of India. It is the prime agency for the development and promotion of Indian spices. The Spices Board, among other activities:

(1) Develops and implements better production methods;

(2) Helps farmers get better yields through scientific agricultural practices;

(3) Provides financial and material support to growers;

(4) Registers and licenses all spice exporters;

(4) Conducts studies on better processing practices;

(5) Provides training for exporters including ISO 9000 and HACCP;

(6) Provides training to farmers on sanitary post harvest practices; and

(7) Helps develop new products at its evaluation and analytical laboratory.

The Board also serves as an international link between Indian exporters and importers. MPEDA and the Spices Board of India also have international offices. The Spices Board Quality Evaluation Lab has acquired ISO 9002 certification from the British Standards Institution. This lab provides analytical services to the spice industry so that it can meet the requirements of international customers.

ANNEX – III

Standard Setting Bodies

The Bureau of Indian Standards (BIS) is the premier standard setting organization in India. It sets standards for all types of products after wide consultations with the industry and government departments. For this purpose, BIS has divided into various departments. Relevant to us are the departments relating to chemicals and the department for food and agriculture products.

The Chemicals Department primarily draws up product standards. The domestic environmental laws are factored in while drawing up the standards.

The Food and Agriculture Department was studied more closely. It has 27 sectional committees for preparing standards ranging from pesticides, agriculture product groups, food hygiene and food microbiology, to machinery and irrigation systems used in the food sectors. Each Committee meets at least once a year and consists of 30-40 members representing industry, consumers, exporters and government departments. The membership is renewed every two years. The Committees generally discuss review of existing standards, finalization of a standard on which work was started earlier, or setting up a new standard where none existed before. Any member can put forward a proposal. In the Committees under the Food and Agriculture Department the most important realization in recent times is on the limits to be followed for possible contaminants in food standards, even where regulations already exist. Often, Codex and EU standards are discussed for deciding upon the new limits.

The BIS has set about 17,000 standards so far. These standards are voluntary in nature. However, when a Government Department

lays down a mandatory standard, it looks for a BIS standard if it exists and generally adopts it. The BIS is undertaking an exercise to harmonize its standards with ISO/Codex/EN. About 185 standards have been so harmonized in the food sector. The difficulty encountered by the BIS in harmonizing more standards relates to local Indian conditions for production of the relevant commodities, which necessitate differential standards for the achievement of the same level of health or safety. Very often, the industry representative on a BIS Committee is reluctant to bring about a change in the standard because that would entail a change in production procedure or equipment, thus involving higher costs and difficulties in maintaining competitiveness. The BIS could work on these standards by preparing equivalent standards that meet the same safety, health or other objectives that guide the ISO/Codex/EN standards.

BIS is active in the TC 207 Committee of the ISO where eco-labeling standards are being finalized. It is reported that BIS representatives have questioned some aspects of the Life-Cycle approach on the basis of absence of transboundary effects, but they are in a minority. It may be recalled that ISO standards are set on a majority vote basis.

The BIS also certifies companies for ISO compliance, as well as compliance with its own standards. The BIS is also certifying for IS: 15000, whicb is the standard for HACCP. Eight units have taken up HACCP from the BIS, including Pepsi Food Ltd. and Mother Diary, a Delhi-based government undertaking dealing with Milk and Milk Products. Many firms prefer international certifying agencies (like SGS) for HACCP and other certification in spite of higher costs because of their better credibility.

There is a multiplicity of standard setting institutions, as many Federal and State Government Departments have their own standard setting process for specific items of commerce. This occurs because different departments require goods tailor-made for specific needs, railways for example. However, this leads to a lot of confusion in the domestic market. According to the BIS, there are at least 24 standard setting bodies at the central level and a host of related bodies at both

the central and state level. With a view to instill better coordination for harmonization of standards at the domestic level, the BIS is trying to harmonize such standards and has been able to do so for about 3500 standards (including 700 standards in the food sector) so far. At the international level also, the BIS is making an attempt to sign mutual recognition agreements (MRAs). Seven such MRAs have been signed with Russia, Germany, Israel, China, Mauritius, Turkey and Cuba.

The BIS is India's "inquiry point" under the WTO TBT Agreement. The Ministry of Commerce has also authorized the BIS to take care of the notification obligations arising out of the TBT Agreement. However, the organization does not appear to be geared up to meet the challenges of being an inquiry point or the notifying agency. It notified five odd standards some years ago, but these standards related more to the SPS Agreement than the TBT Agreement. The BIS does not even have a national notification system for India. In effect, this means that even the national standards are not available at one place and would have to be accessed from a plethora of standard setting bodies at both the federal and state levels. The BIS, however, follows the TBT code of good practices.

Another relevant national organization is the National Accreditation Board for Laboratories (NABL). It is formed under the Ministry of Science and Technology and deals mainly with accreditation of laboratories and monitoring performance regarding testing, calibration, etc. NABL has an arrangement with the European Cooperation for Accreditation of Laboratories (EAL) through an MoU signed in 1995, with accreditation bodies from 16 Asia Pacific countries including India. Little effort has been made by NABL to foster MRAs between India and Europe as well as the other Asia Pacific countries. Clearly, NABL is not fully geared up in its role in the standard setting and accreditation process.

The Prevention of Food Adulteration Act, 1954 (PFA) deals with food standards. A Central Committee for Food Standards (CCFS) has been set up at the federal level with nine sub-committees dealing with different subjects such as cereals, oils and fats, milk and milk

products, etc. The sub-committees first generate data to support a new proposal or revision of existing standards in cooperation with laboratories, industry and consumers. Then the proposal is sent to the CCFS, which is chaired by the Director General of Health Services and has representation from all States, three representatives from industry, two from consumers, two government experts, the BIS and related Ministries. If agreed at the CCFS level, a 60-90 days notice period is given to the public to react before notifying the standard. These are mandatory standards, unlike the BIS standards.

The PFA health standards are not necessarily identical to Codex standards. For example, standards for fruits and vegetables follow the Codex limits while for foodgrains the limits are almost half of Codex limits. In some cases, due to nutritional status, dietary practices and technological feasibility, some Indian standards are even more stringent than Codex. For example, India does not allow the use of artificial sweeteners in chocolates or the use of artificial colours and flavours in edible oils. The permissible limits are calculated on the basis of Acceptable Daily Intake (ADI) per kilogram of body weight per day.

Although attendance by Indian delegates to Codex meetings has been irregular, they have objected to Codex standards from time to time. For example, India objected to labeling milk with a picture of a buffalo, to a reduction in the permissible level of sulphur dioxide in sugar from 70 ppb to 20 ppb, and to a proposed permissible level of aflatoxin in milk at 0.05 ppb based on per capita consumption of 1500 gm against the Indian consumption of 300-400 gm. The Indian voice is generally lost in the majority comprising developed country representatives.

Much is wanted in the implementation of PFA, particularly because enforcement is done at the state level, where health departments are pre-occupied with disease control, and food safety receives low priority. Lack of trained inspectors and well-equipped labs is also a cause. The federal Health Ministry has only four laboratories.

ANNEX – IV

Enforcement Bodies

The Export Inspection Council (EIC) was set up in 1963 to advise the Government with regard to measures for enforcement of quality control and inspection, and also to arrange for pre-shipment inspection of commodities intended for export. The EIC operates via its regionally located agencies or Export Inspection Agencies (EIAs) at Mumbai, Calcutta, Cochin, Delhi and few more places. The EIAs have 61 offices at various port towns and industrial centres.

To get the consignment inspected, the exporter informs the inspection agency concerned a few days (depending on product and inspecting agency norms) before shipment. Inspection is done according to the standards set out in the export contract. If none is mentioned, the goods are generally checked against standards set by the BIS.

Exports can be inspected in three ways: consignment-wise inspection (CWI), In Process Quality Control (IPQC), and self-certification. In addition, stringent requirements have been prescribed for 4 elements, namely design and development, quality-audit, after-sales service, housekeeping and maintenance of self-certification scheme for exporters.

Thus organizationally, as also by expressed intentions, it seems that the EIC is a competent authority for certifying the quality of a good. Moreover, as many as 1000 commodities (under groups such as food and agriculture, fisheries, minerals and ores, organic chemicals, inorganic chemicals, rubber products, refractories, ceramic products, pesticides, light engineering products, steel products, jute products, coir and coir products, footwear and footwear components) are under compulsory pre-shipment inspection obligations of the EIC.

In 1995, EIC adopted the Export of Fresh, Frozen and Processed Fish and Fishery Products (Quality Control, Inspection and Monitoring) Order and Rules, 1995. In keeping with its lofty ideals, the order has been made keeping in mind "the requirements of the importing countries that would encompass standards like unified directive No.91/493/EEC dated the 22nd July 1991 of the EC, the proposed HACCP of USA and Quality Assurance Standards of Japan". Thus, the EU recognised EIC approval for inspection and monitoring of fish and fishery products imported to the EU.

Likewise, in its order dated 23.8.97, the EIC adopted EU norms for egg products. In November 1997, the EIC adopted the Animal Casing Inspection Rule of the EU. Such exercises are almost like 'harmonization' events. Obviously, this has meant clearer comprehension of inter-country demands, though at cost to the domestic industry in the form of increased compliance costs.

Yet, even with a seemingly impressive infrastructure like this, EIC is not always an exporter's first choice for getting a quality certificate. Surprisingly, 4 out of 7 questionnaire replies that we received indicated names of other agencies for this purpose. Most EPCs and industry people to whom we spoke reported a discouraging feedback on EIC.

Most exporters and export-promotion councils like EEPC, ATMA, etc. informed us that in the past, there have been cases when EIC-approved consignments were declared unfit at international borders, and usually because the EIC approval had been faulty. Such faults were discovered to be cases of gross negligence. Such instances may not have been recorded as specific episodes, but they generally harm the credibility of the EIC. Industry people emphasize that the EIC is relatively lax about following strict quality norms. In fact, even merchant exporters of fish products, despite the 'harmonized' 1995 order of the EIC, subscribe not to the EIC but to private inspection agencies.

The EIA is also accused of corrupt practices. A stark example of such a practice is the frequent export of silver pomphret with EIC

certification, in spite of a ban on its export. (Evidently, 'silver' pomphrets are passed of as 'white' pomphrets.) EIC-certified consignments have often been found unfit, but since the goods have often already reached the foreign port, and the RBI norm asks for foreign currency to be brought back, the exporter is compelled to make a distress sale. Distress sales were often reported in private conversation. Exporters were not willing to take up the matter officially due to the fear of loss of future business, or loss of credibility in the market place.

As indicated above, the inspection and product testing required under the Act is carried out both by the Central Government's Export Inspection Agency and also by government sanctioned private agencies or laboratories. There are 28 Government Export Inspection Laboratories and approximately 40 private export inspection laboratories. No non-government laboratory has yet been authorized to conduct food export inspections, so all food exports are inspected and tested by government laboratories. There are now approximately 1500 government inspectors and analysts and approximately 400 analysts and inspectors in private as well as government-sanctioned laboratories.

There is some confusion in India among spice exporters, in particular, about whether inspections are mandatory or voluntary. According to the Export Inspection Council, inspections are mandatory: all consignments for export that include notified commodities must be sampled and tested for adherence to export quality standards. According to spice exporters, standards for whole and ground spices are not mandatory. They point out that the old grade standards AGMARK were mandatory, but several years ago they were made voluntary and they are outdated anyway (the last revisions were in 1973).

Whether mandatory or not, it is clear that with only 1,900 inspectors responsible, for the whole of India, for the over one thousand commodities on the notified commodities list, it would be impossible to check all export consignments. Clearly the practice in India is to check only some export consignments.

Whom do the exporters resort to as an alternative? Clearly, the exporter chooses an agency whose credibility is high and thus the acceptance of the goods abroad is more likely. Multinational players in the arena include SGS (India) Ltd. of Switzerland, Cotecna of France, Bvgi of the Netherlands and Lloyds of London. The chief amongst these is SGS. It has the major market share in the field. SGS offers third-party inspection and quality control. It has 10 divisions, 52 offices and 32 laboratories in India and has been here for 48 years. It inspects nearly all goods except defense and aviation products. SGS uses a comprehensive import supervision service (CISS), which is based on a pre-shipment inspection in the country of supply on behalf of the government of the importing country. CISS covers inspection of quality, quantity and price, and verification of the value and classification of the goods for customs purposes, allowing for correct assessment of import duties and taxes. There is a uniform application of import regulation, value and customs classification, and third party verification. All this facilitates a speedier clearance of goods at the time of import.

The CISS *modus operandi* involves two kinds of methods. One is where the individual seller directly approaches SGS for inspection of his goods, with the purpose of attaining a 'quality-based' clearance certificate.

The other method, not prevalent in India, is what SGS calls 'mandatory-inspection'. Here SGS works on contract basis with the governments of importing countries. In this method, for example, governments in most African and Latin American countries offer a time-bound contract of two or more years to SGS. Under this contract, the SGS is the sole agency officially assigned to inspect goods originating from India directed towards these African or Latin American nations. , SGS also carries out evaluation of goods by comparing the market price of the goods in the country of origin and the country of final destination. Thus the agency tries to prevent under-invoicing of exports.

Contracts for the EU and Asia regions have been assigned to SGS once again. The contract was won by SGS from among

its competitors, who bid tenders to the importing countries for the contract.

SGS inspects the items against standards laid down by the buyer, or against the prevalent international standards. If SGS finds itself incapable of inspecting for a particular standard, due to lack of technological facilities, etc., it tries to collaborate with sufficiently equipped labs. In fact, SGS has sufficient infrastructure in its laboratories to check for the most stringent quality standards - even for the azo dye standards, and the new EU limits for aflatoxin.

ANNEX - V

Hazard Analysis Critical Control Points (HACCP)

"Government decree is a poor reason to put a HACCP system in place. Doing it because the government says you have to is probably the worst reason to do it" H. Russell Cross, director of the Institute of Food Science and Engineering at Texas A&M University.

Historical Background

The Hazard Analysis Critical Control Point (HACCP) system is widely recognized as the preferable system for assuring food safety. Many national and international scientific groups, corporations, government agencies and academic organizations have endorsed HACCP.

HACCP started in 1959 with the Pillsbury Company's manufacture of food products for the NASA space program. There was concern about the safety of the foods. System failure due to food particles contaminating electrical circuitry, for example, was one potential problem. Using bite size food pieces that were specially coated and individually packaged solved this. A requirement was that foods consumed on the spacecraft had an absolute assurance of safety.

An early option considered for assuring safety was sampling for pathogenic microorganisms. However, the proposed standard was discarded when it was recognized that the presence of one Salmonella organism in one thousand units of food could result in a 98% probability of accepting a defective lot if twenty units were sampled, and a 50% risk if 690 units were sampled. The required level of testing for assurance of safety was impractical and ineffective.

The "Zero Defects" concept was also considered and discarded because reliable non-destructive testing methods for bacterial pathogens were lacking.

The US Army's "Modes of Failure" concept to predict what could go wrong and to select key points in the process to monitor (the forerunner of modern process control) was evaluated and adopted. From this evolved the concepts of Critical Control Points (CCPs) and prevention, thereby laying the foundation for the development of the HACCP system.

In 1971, at the United States Conference on Food Protection, the principles of HACCP and their application to foods were first described. There were 3 principles - identification and assessment of hazards through various stages from growing to consumption; determination of the critical control points to control any identified hazards; and, establishment of systems to monitor the critical control points. This platform has since been modified and extended to the format now published by the National Advisory Committee on Microbiological Criteria for Foods (NACMCF), and Codex Alimentarius.

In 1972 there was an outbreak of botulism from commercially canned potato soup. This outbreak prompted the U.S. Food and Drug Administration (FDA) to promulgate regulations for the production of low acid canned foods. These regulations included many of the basic concepts found in HACCP. Also in 1972, FDA inspectors were trained in HACCP principles and their application.

During the 1970s, however, there was much talk at scientific meetings about the merits of HACCP. Only a few American food processors embraced the HACCP discipline. While it was seen as an exciting initiative, the extensive work involved in correctly implementing the requirements often could not be justified, and interest in the HACCP stagnated.

In 1985, the United States National Academy of Sciences rekindled major interest through the publication of their report

"Microbiological Criteria for Foods and Food Ingredients" which strongly endorsed the use of HACCP as an effective, preventive system for the safe manufacture of food products. The International Commission for the Microbiological Specifications for Food (ICMSF) followed in 1988 with their fourth volume, which covers HACCP in food safety and quality. This publication is recognized for its contribution towards the internationalization of HACCP.

In 1989, the NACMCF published their recommendations titled "HACCP Principles for Food Production". The NACMCF is a committee appointed by, and advisory to, the USDA, DHSS, FDA, DOC, NMFS, and DOD.

In 1991, the Codex Committee on Food Hygiene developed "Guidelines for the Application of the Hazard Analysis and Critical Control Point (HACCP) System". This Codex report was adopted by the 20th Session of the Joint FAO/WHO Codex Alimentarius Commission in 1993, and the HACCP standard is currently in the process of being adopted.

As a result of experience in applying the HACCP principles and recognizing the changes proposed by Codex, the NACMCF revised their recommendations and published them in the document "Hazard Analysis and Critical Control Point System". The NACMCF is currently revising its 1992 document, with the goal of providing a concise document that clearly defines the HACCP principles, and gives practical guidance in their application.

HAACP Systems and Principles

HACCP is a systematic approach to be used in food production as a means to assure food safety. The application of HACCP principles is encouraged at every stage of the food system. The objective is to prevent food safety problems before they occur. These food safety problems include biological, chemical and physical hazards.

The development of an HACCP Plan and an HACCP system involves the application of five preliminary steps and seven principles. These are:

Preliminary Steps -

1. Assemble the HACCP team.
2. Describe the food and the method of its distribution.
3. Identify the intended use and consumers of the food.
4. Develop a flow diagram, which describes the process.
5. Verify the flow diagram.

Principles -

1. Principle No. 1: Conduct a hazard analysis. Prepare a list of steps in the process where significant hazards occur and describe the preventive measures.
2. Principle No. 2: Identify the CCPs in the process.
3. Principle No. 3: Establish critical limits for preventive measures associated with each identified CCP.
4. Principle No. 4: Establish CCP monitoring requirements.
5. Principle No. 5: Establish corrective action to be taken when monitoring indicates that there is a deviation from an established critical limit.
6. Principle No. 6: Establish effective record-keeping procedures that document the HACCP system.
7. Principle No. 7: Establish procedures for verification that the HACCP system is working correctly.

The written document that is developed from the application of these steps to the production of a food product is the HACCP Plan. The next step is to implement the plan with the result being an HACCP system. Finally, the HACCP system must be maintained through periodic verification and updating.

HACCP Application

HACCP is not the magic bullet that absolutely solves all food safety problems. It is, when properly applied, a set of preliminary

steps and principles that gives a systematic method for identifying significant hazards and properly applying preventive measures so that food borne hazards are prevented, eliminated or reduced to an acceptable level. With emerging international and national agreement on HACCP principles, their application would create commonality of understanding of the development, implementation and maintenance of a food safety system. Having these commonly understood principles, many food processors, for example, require their suppliers to have an HACCP system in place for production of ingredients that they supply. Identifying the most likely sources of food borne hazards will allow more attention to be focused on those sources. The ideal response is the implementation of effective, documented systems that eliminate or reduce the likely occurrence of food borne hazards.

A mistake often made in relation to HACCP is to assume that it covers only pathogenic bacteria. In applying HACCP, all food borne hazards are to be considered. There are a number of hazards that can originate during production. Food borne hazards that can originate during production may be biological –(Salmonella, Campylobacter jejuni, E. coli, Listeria monocytogenes, Yersinia enterocolitica, Cryptosporidium parvum, and Trichinella) or chemical– (pesticides and drugs).

An important definition in HACCP is the identification of a Critical Control Point (CCP): a point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated, or reduced to an acceptable level. Therefore, if the identified food safety hazards are to be controlled through a HACCP system, there must be a step or steps in production where control can be applied and there must be an associated preventive measure.

It is essential that there be scientifically documented steps and preventive measures. If this criterion cannot be met, then a HACCP system cannot be developed. A HACCP system can only be developed through proper application of the preliminary steps and principles of HACCP. An essential prerequisite to HACCP is the adoption of Good

Manufacturing Practices (GMPs). The biggest problem in HACCP Plans is the lack of true critical control points.

Biological hazards are much more difficult to deal with than most other food processing hazards. For example, proper heating times and temperatures will kill E.coli; therefore, this can be a CCP. However, at present there is not enough known about the sources and control of E.coli to be able to apply preventive measures.

Thus there is lack of knowledge and research at the preprocessing stage. Research has not provided for reduction or elimination of these pathogens at the preprocessing stage. There are possible interventions that could be considered as preventive measures on which a CCP could be based. However, these interventions need considerable research before they can be applied on a practical basis in a HACCP system for actual production.

Observations

-- Theory and practice are both critical to the successful design and implementation of a Hazard Analysis and Critical Control Point program.

-- HACCP is a prevention, not detection, process. It may be difficult for some processors to grasp the concept of process control, when the inspection system to this point has been focused on the detection of problems through various tests, but it is a valuable exercise. Microbial testing can be done as one verification step to help assure a HACCP system is working, but by itself it is a poor tool for use in monitoring or assuring a safe product. Thus it is a process and production method and CCPs may not be product related only. That is, some CCPs would ensure that the process is safe for the environment in which production takes place, but would not be relevant to what gets finally incorporated in the product itself. Principle 6 above is an example at a broad level.

-- HACCP can be a profitable proposition due to increased market access. HACCP is a process control and can help companies get a better handle on their operations. At the same time, good

HACCP systems will improve the safety of product coming out of their plants.

-- Since the product, by its very nature, cannot he guaranteed 100 percent safe, HACCP provides an important improvement and should be considered on those merits.

-- HACCP is a dynamic system and only good as long as you keep it up. The evolving nature of HACCP means that companies can't introduce the system and let it run by itself. Monitoring and verification are needed.

-- HACCP standards were considered an additional cost by many of the respondents. Some even questioned the relevance of some specific elements of the standard to their product or to safety itself. None, however, said the process wasn't worth the time or effort to get it going, or that they were discontinuing their programs for lack of perceived benefits.

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