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Processed Food Products Exports from India: An Exploration with SPS Regime*

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Units of Conversions

1 Lakh = 100,000

1 Crore = 1,00,00,000

1 Million = 10 lakh

Indian Financial Year = April-March

1 Billion = 100 crores

1 US\$ = Rs 47.53 (2001-02)

Glossary

AA:	Aquaculture Authority
ACIAR:	Australian Centre for International Agricultural Research
APEDA:	Agricultural and Processed Food Products Export Development Authority
AQIS:	Australian Quarantine and Inspection Services
BIS:	Bureau of Indian Standards
CCFS:	Central Committee of Food Safety
CCP:	Critical Control Point
CEPAC:	Central Fruit Products Advisory Committee
CIFTI:	Central Food Technological Research Institute
CII:	Confederation of Indian Industries
CRZ:	Coastal Regulation Zone
CWI:	Consignment wise Inspection
DMI:	Directorate of Marketing and Inspection
EIA's:	Export Inspection Agencies
EIC:	Export Inspection Council
EOU:	Export Oriented Units
ETP:	Effluent Treatment Plant
EXIM:	Export and Import Policy of India
F&FP:	Fish and Fishery Products
FDA:	Food and Drug Administration
FICCI:	Federation of Indian Chambers of Commerce and Industry
FSMSC:	Food Safety Management Systems based Certification
FYM:	Farm Yard Manure
GAP:	Good Agricultural Practices
GATT:	General Agreement on Tariffs and Trade
GMPs:	Good Manufacturing Practices
HACCP:	Hazard Analysis Critical Control Point
ICAR:	Indian Council of Agricultural Research
ICPM:	Interim Commission on Phytosanitary Measures

IPPC:	International Plant Protection Convention
IPQC:	In-Process Quality Control (IPQC) System
ISC:	International Standards Certification
ISIC:	International Standard Industrial Classification
ISO:	International Standards Organisation
JECFA:	Joint Expert Committee on Food Additives
OGL:	Open General License
OIE:	Office International des Epizooties
MFPI:	Ministry of Food Processing Industry
MFPO:	Meat Food Products Order
MMPO:	Milk & Milk Product Control Order
MPEDA:	Marine Products Export Development Authority
NAFED:	National Agricultural Co-operative Marketing Federation of India
NCRM:	National Research Centre for Mushroom
NEERI:	National Environmental Engineering Research Institute
NPPO:	National Plant Protection Organisation
NPR-PPMS:	Non-Product-Related Process and Production Methods
NSF:	National Sanitation Foundation
PFA:	Prevention of Food Adulteration Act
PPB:	Parts Per Billion
PPM:	Parts Per Million
QMS:	Quality Management Systems
RPPO:	Regional Plant Protection Organisation
SPF:	Specific Pathogen Free
SPS:	Sanitary and Phytosanitary Measures
SGS:	Societe Generale De Surveillance
TBT:	Technical Barriers to Trade
TRIMS:	Trade Related Investment Measures
USDA:	US Department of Agriculture
VAT:	Value Added Tax
WTO:	World Trade Organisation

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* Peanut and Groundnut used interchangeably

Processed Food Products Exports from India: An Exploration with the SPS Regime

By

R. Mehta and J. George*

I. Introduction

The conclusion of the Uruguay Round of negotiations in 1995 and the emergence of the Agreement on Agriculture (AOA) raised the hope that developing country trade in agricultural commodities, be it primary or processed, would be less restricted, with increased market access leading to greater international trade. However, as these and other promises were far from being fulfilled it was resolved at Doha to take a comprehensive look at these issues.¹

Despite expectations that world trade would expand substantially after the formation of the WTO in 1995, overall merchandise trade as well as agricultural trade ironically shrank, against the backdrop of a sharp slowdown in the world economy. . This was not surprising, given that developed countries dominate agricultural trade. Brazil is the only developing country among the 10 top exporters of agricultural commodities, while there are six EU members in the top 10. All 10 top importers of agricultural commodities are developed countries. However, this situation may change in future, as there is some evidence that developing countries are placing more emphasis on new agro-based manufacturing activities for export expansion.²

Increasing agricultural exports from developing countries can have important benefits, as agriculture remains the major source of livelihood and food security for large sections of the population. If SPS measures become too stringent, the resulting contraction in agricultural exports would have a significant negative impact on such communities.³ Even the WTO has recognised this, and it has highlighted the need for consumers to compensate producers who

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¹ See Watkins, Kevin (2001), 'Eight Broken Promises: Why the WTO isn't Working for the World's Poor', Oxfam Briefing Paper # 9 October, Oxfam International. [www.oxfaminternational.org/what_does/advocacy/trade.htm]

² See Section II for details.

³ These are initial propositions emerging from a preliminary examination of certain selected processed food products. See Mehta, R., M. Saqib and J. George (2002), 'Addressing Sanitary and Phytosanitary Agreements: A Case Study of Select Processed Food Products in India', *RIS Discussion Paper No. 39*, New Delhi.

would be adversely affected in this manner. It has also pointed out that the removal or relaxation of overly stringent SPS regulations could generate welfare gains to consumers.⁴ Obviously, in the global context, the majority of producers fall in the developing country category and may not be able to effectively access the developed country markets if restrictions are very severe.

The significance of SPS measures in today's agricultural commodities trade can be gained from the number of notifications circulated since the agreement came into force in 1995. Nearly 2630 notifications (Table I.1) have been circulated from 1995 to the end of 2001. During this period, the USA with 526 submitted notifications and Mexico with 175 were the most proactive trading countries in as far as SPS measures are concerned.

Year	Number of Notifications Circulated
1995	197
1996	244
1997	293
1998	332
1999	433
2000	360
2001	770
Total	2629
<i>Source: WTO information (documents G/SPS/N*)</i>	

It is reported that USA notified the largest number (155) of SPS measures in 2001.⁵ In fact, it is estimated that OECD countries have submitted two out of every three notifications.⁶ Although, these notifications are submitted in conformity with the transparency clause (Article 7) of the SPS Agreement, these figures indicate the legislative complexities of SPS policies in the countries that dominate international trade in agricultural commodities.⁷

⁴ See WTO Director General's Annual Report 2002, World Trade Organisation, Trade Policy Review Body. WT/TPR/OV/8.

⁵ WTO, *ibid*:p.23.

⁶ See OECD (2002), "Sanitary and Phytosanitary Measures and Agricultural Trade: A Survey of Issues and Concerns Raised in the WTO's SPS Committee", Joint Working Party on Agriculture and Trade (JT00129244).COM/TD/AGR/WP(2002)21/Final.

⁷ A detailed exposition on the legislative dimensions of SPS agreement is beyond the scope of this paper. For details, see Mehta, Rajesh and J. George (2002), 'SPS Measures: A Study of Adjudicative and Legislative Roles Since 1995', RIS/IFRSS#4 (forthcoming).

The fresh flow of notifications indicates that higher and more stringent SPS standards (that go beyond the international standards (Codex, etc.)) are being imposed by individual countries to protect human as well as plant and animal health. The proliferation of higher and stringent food safety standards draw developing countries into an unknown territory of international trade for which they are ill equipped and unprepared. Interestingly, some of the more buoyant export commodity groups for India, namely, coffee, spices, fresh fruits and vegetables and pulses, will now have to reckon with more stringent certification and labelling provisions notified by the developed countries.

Producing for export also requires sensitivity to the changing demand scenario in the world market, which, in recent times, is greatly influenced by food safety standards. Therefore, the traditional wisdom that attributes the growth and importance of agricultural exports to lower capital per unit of output, shorter gestation period and strong backward and forward linkages requires a closer examination.

These linkages are of paramount importance for several reasons. For example, value added processed food exports require two necessary conditions: (i) a threshold base of manufacturing and other infrastructure facilities and, (ii) a reasonable level of marketable surplus in those primary products that enter as crucial inputs into food processing (industrial activity) chain. The food processing technologies, admittedly, range across a wide spectrum but a successful and viable business enterprise must be able to harness economies of scale. The economics of the processing plant depends critically on having a large volume of raw material supply of adequate quality. The supply chain, being biological in nature, often requires extra effort for time-temperature domain management when integrating with industrial applications. In processing, principal raw materials and by-products to enhance value-addition, the food quality dimensions must not be lost sight of. In as much as microorganism contamination along with additives is critically important in determining compliance with food safety regulations, FATTOM⁸

management in the manufactured foods becomes significant. A clear understanding of the dynamics of FATTOM can be used to regulate microorganism growth in the processed foods⁹.

Developed countries, may have a distinct edge over the developing countries in the manufacturing domain because they have better access to processing technology and packaging innovations. These initiatives coupled with a distribution network do cater to the changing dietary patterns across space and age. Hence, the developed countries accounted for around three fourth of world processed food exports in 1999, though the developing country share had increased somewhat after 1995¹⁰. The contrast can be well illustrated by the fact that India, though the largest producer of bovine milk in the world during 1999, had a mere 0.5 per cent share in the processed food exports¹¹. Even the marginal gains by the developing countries in processed foods are confined to a few categories; in 1999, for example, these were visible only in Fish Products, Vegetable Oils and preserved Fruits and Vegetables. This explains to a considerable extent why developed countries issue most SPS notifications (Table I.1). These aspects must be taken into account when considering the post-WTO international trading system and the SPS regime.

In what follows (Section II), a close look is taken at the processed food product industry to assess the relative position of India. The section also examines the incidence of detention of shipments on the grounds of non-compliance with the SPS regime. The theme is further developed with the help of case studies in Section III. The concluding observations are presented in Section IV.

⁹ See <http://foodsafety.cas.psu.edu/> for greater details.

¹⁰ See Tables (1-3) for details in Athukorala, *et al.* (2002), "International Food Safety Regulation and Processed Food Exports from Developing Countries; The Policy Context and the Purpose and Scope of the Research Project". A paper presented at the Bangkok Workshop (1, October, 2002).

¹¹ For a further overview of the Indian Food Processing industry based on the International Standard Industrial Classification (ISIC), see Section II.4 in Mehta, Saqib and George (2002), pp: 16-19.

II. Processed Food Exports

In current discussions about Indian agriculture, the suggestion is commonly made that agriculture should quickly move towards processing and value-addition, with a consequent increase in exports of processed food products.¹² However, the role of food quality or safety standards is not raised explicitly in these discussions. However, a welcome change is now taking place with food safety issues being brought to the forefront. The present paper is part of an initiative in this direction.¹³

II.1 *An Overview*

A comprehensive report presenting concrete proposals for various processed food product lines emerged for the first time in 1998 indicating that Indian producers have become serious about the food processing issues as per WTO stipulations.¹⁴ A Subject Group on Food and Agro Industries under the Prime Minister's Council on Trade and Industry was constituted (in 1998) to submit a long and comprehensive list of recommendations to re-engineer the food processing sector in India.¹⁵ This Group strongly recommended a strategy for the New Food Revolution (NFR) based on processing and other transformative activities in agriculture and allied sectors. In order to appreciate the importance of these recommendations it is useful to reflect on the following facts presented in the report:

- ⇒ About 20 per cent of all foods produced in India, valued at about Rs. 50,000 crores, are wasted;
- ⇒ The cost of such wastage is estimated to be over six times the amount spent on food subsidies by the government;

¹² For example, refer to Gulati, Ashok (1992) 'Rapporteur's Report on Agricultural policy in the Light of New Trade and Industrial Policy', *Indian Journal of Agricultural Economics*, Vol. 47, No.3, July-September: 560-66.

¹³ The Country Status Paper entitled, "International Food Safety Regulation and Processed Food Exports from Developing Countries: A Comparative study of India and Thailand" discussed at the Bangkok Conference (October 2002) and Mehta, Saqib and George (2002), can be considered as the initiators in addition to the Launching Workshop Proceedings (October 2002), *International Food Safety Regulations and Processed Food Exports from India: An Exploration into Research Agenda*, RIS (mimeo).

¹⁴ See CII-McKinsey (1998), *Food and Agriculture, Integrated Development Action (FAIDA) Report*.

¹⁵ See Prime Minister's Council on Trade and Industry 1999; Report on *Food and Agro Industries Management Policy*, www.nic.in/pm councils/reports/food/for details.

- ⇒ The producer's share in the domestic consumer's retail price is a mere 25 per cent as opposed to 50 per cent in developed countries;
- ⇒ Only 25 per cent of produced food grains utilise scientific and modern storage facilities;
- ⇒ Annual post-harvest losses are estimated to total 10 per cent of total food grain production, an amount equal to Australia's annual food grain production.
- ⇒ Though India produces a wide range of both tropical and temperate fruits and vegetables and is the world's largest producer, less than 2 per cent of production is processed and about 25 per cent is lost as "wastage".

Though these figures are to a large extent "guesstimates", they nevertheless give some idea of magnitudes involved. But what is noteworthy is the failure to mention issues of food quality and safety norms and challenge the food industry to adopt a proactive role with a viable business plan.

Two nodal agencies for processed food exports have been identified in India at the national level. These are the Agricultural and Processed Food Export Development Authority (APEDA) and the Marine Products Exports Development Authority (MPEDA). While MPEDA is responsible for overseeing all fish and fishery products exports, other processed food product exports are the responsibility of APEDA. Given reductions in tariffs and domestic support and expected reduction in export subsidies, increasing food product exports requires searching for new opportunities in terms of better market access and enhanced competitiveness in export markets.

APEDA data sets provide a broad overview of the processed food exports from India¹⁶. Figures for these items from an apex authority like APEDA are expected to be most comprehensive and informative, as India maintained quantitative restrictions and canalisation of agricultural exports until as recently as year 2000. The APEDA export data can be classified into six broad categories as follows:¹⁷

1. Total Floriculture & Seeds

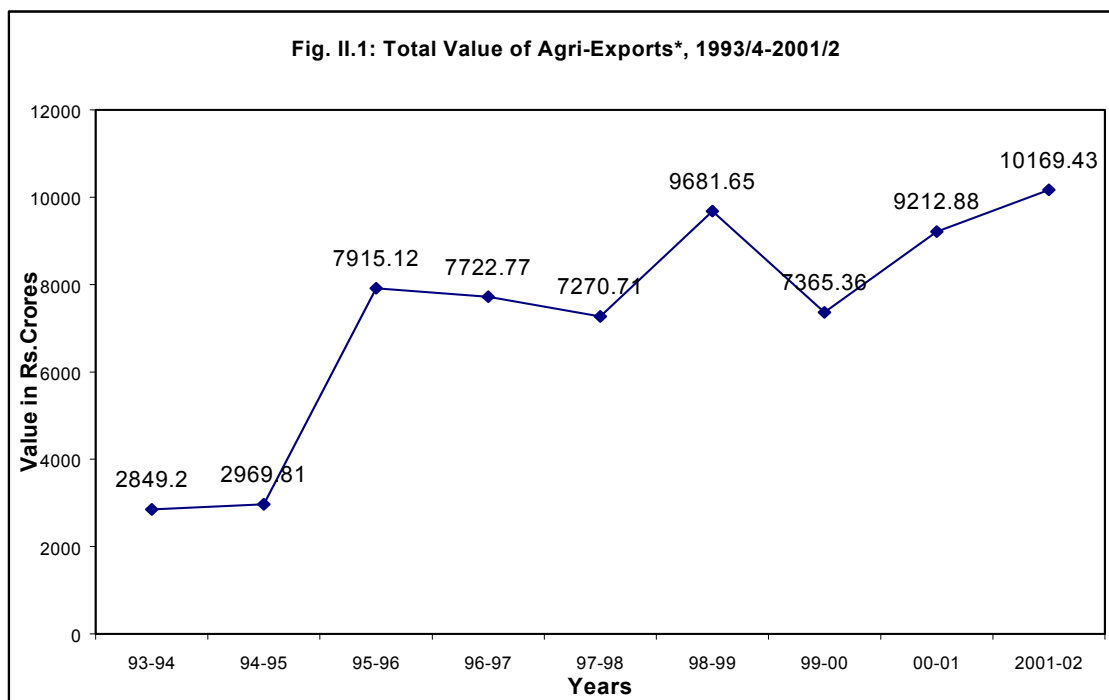
¹⁶ See APEDA's website www.apeda.com, for details. A brief review of processed marine products, however, can be found in Sections II.2 below.

¹⁷ For details of definition of these product by HS classification, see www.apeda.com.

2. Total Fresh Fruits and Vegetables
3. Total Processed Fruits & Vegetables
4. Total Animal Products
5. Total Other Processed Foods
6. Total Cereals.

Each category, in turn, comprises a number of related food products. The overall picture of agricultural and processed food exports (excluding marine and marine products) indicates that:

- a) Both the total export value (Fig. II.1) and that of each subgroup (Fig. II.2) vary significantly from year to year;
- b) The total cereal group, with about Rs. 4620 crores worth of exports in 2001-02, accounted for nearly half of total exports (Fig. II.2);



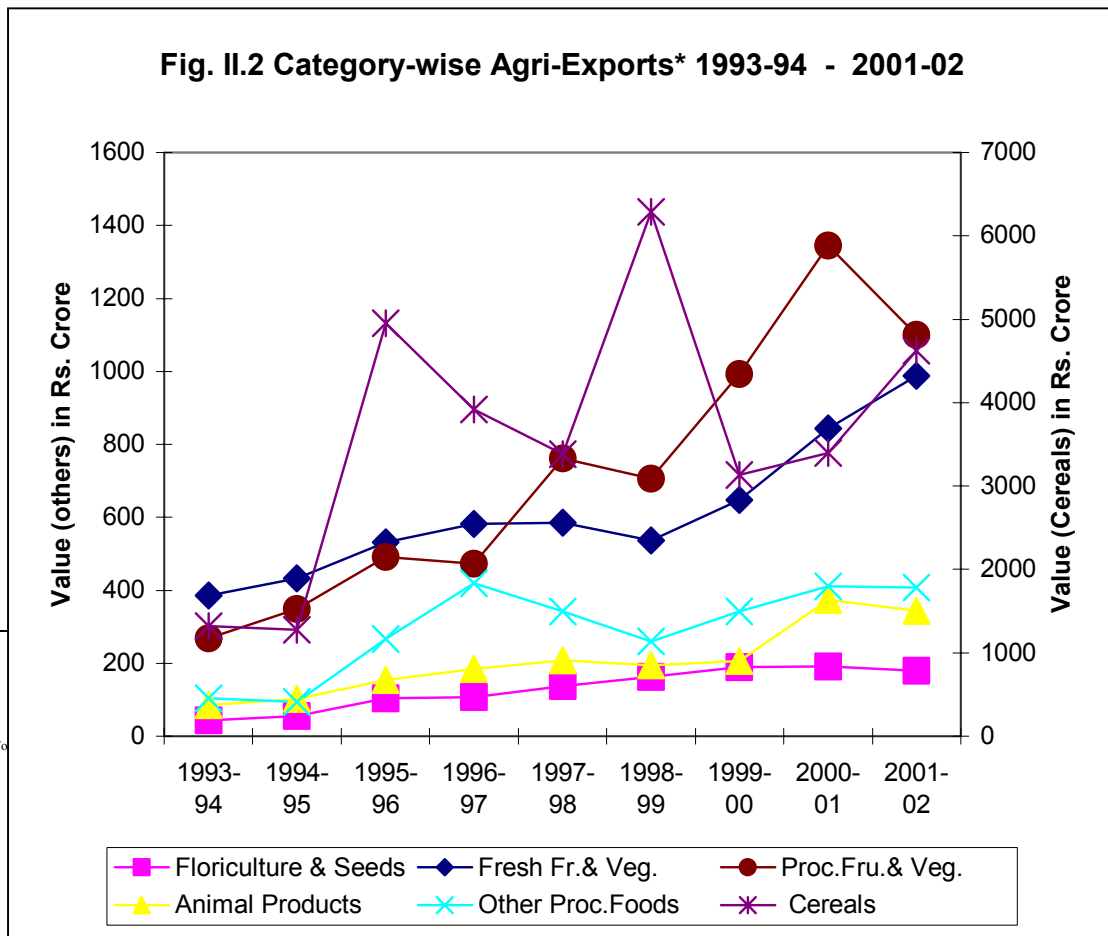
* Floriculture + Fresh Fruit and Veg. + Processed Fruit & Veg. + Cereals + Animal Products + Other Processed Foods

Source: APEDA (www.apeda.com)

- c) Other processed products and total animal products ((Rs. 1780 crores and Rs. 1501 crores respectively in 2001-02) accounted for nearly one third of total export earnings (Fig.II.2) through APEDA's facilitation;

- d) Fresh and Processed fruits and vegetables show a marked growth (<10 per cent CAGR) in exports between 1996-97 and 2000-01(Fig. II.2);
- e) All processed food products undergoing some manufacturing transformation show significantly faster growth compared to non-processed products between 1996-97 and 2001-02. For example, Processed Fruits and Vegetables category recorded a CAGR of 18.36 per cent during 1996-97 to 2001-02 allowing it to improve the relative share from about 6 per cent to about 11 per cent amongst the five broad category totals. Thus processed food products comprising several new product lines account for about 43 per cent of exports during 2001-02.¹⁸
- f) Between 2000-01 and 2001-02, the Fresh Fruits and Vegetables category was the only group to show a positive growth while Processed Fruits and Vegetables (-8%) and Animal Products (-6.5%) recorded a sizeable decline (Fig. II.2). The fall in exports of the latter is interesting, given that these two groups had shown significant growth until 2000-01. It is noteworthy that most notifications for SPS measures admitted at the WTO concerned these two groups.

* Floriculture + Fresh Fruit and Veg. + Processed Fruit & Veg. + Cereals + Animal Products + Other Processed Foods
 Source: APEDA (www.apeda.com)



18

Processed Fo

(1998) given

Against this backdrop, we take up Mango Pulp and Mushrooms from the Processed Fruits and Vegetables category; Poultry Products from the Animal Products category; Groundnuts from the other Processed Food category, and Shrimps from the Marine and Fishery Products category for more detailed discussion in the following section.

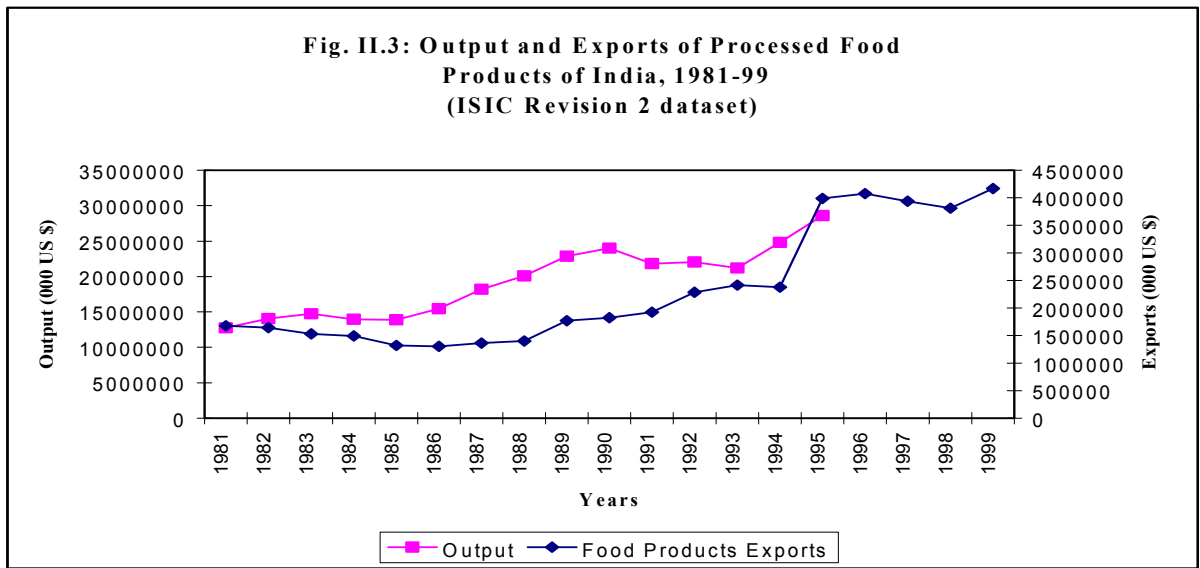
II.2 Food Processing Industry Growth in India

An in-depth analysis of the evolution of the food processing industry in India requires time series data with a comparable data set and commodity basket composition. Such an analysis can throw better light on the dynamism of the processing segment in food exports and permit comparison with experiences elsewhere in the world. However, it should be recognised at the outset that the food processing industry *per se* is a distant cousin of the manufacturing industrial structure/sector. It is dependent, among other factors, on the agricultural sector's output as well as on consumers' dietary preferences. The domestic situation on both these counts did not encourage rapid growth of the food processing industry. While the international scenario in that respect needs to be properly situated and carefully considered, the critical factor has been that the myriad dimensions of food security management in India *ipso facto* laid greater emphasis on enhancing food production rather on food processing.

Despite its limitations, in this preliminary examination we have used the International Standard Industrial Classification (ISIC-Revision 2) for the categorisation of all industrial economic activities to understand this segment of industrial activities, following Athukorala and Sen (1998). We consider that there is presently an opportunity for processing of the natural resource based agricultural products of India into export product lines to gain from emerging trends in the world trade.

Period	Output Growth* (Per cent per annum)	Export Growth* (Per cent per annum)
1981-90	7.00	0.33
1991-95	6.59	14.95
1996-99	N.A.	0.34

Note: (1) Comparable data sets of ISIC used for estimation
(2) N.A. denotes relevant data set not available.
*Based on log-linear equation.
Source: World Bank: www1.worldbank.org/wbiep/trade/TradeandProduction.html



Source: [ww1.worldbank.org/wbiep/trade/Trade and Production.html](http://ww1.worldbank.org/wbiep/trade/Trade%20and%20Production.html)

An immediate consequence of the trade liberalisation initiated during the early 1990s can be seen in the growth rate (Table II.1; Fig. II.3) of processed food exports.¹⁹ The nearly 15 per cent per annum growth rate achieved in the exports of processed food products during the period 1991-95 must be viewed against the backdrop discussed in the previous paragraphs, namely, the rising trend of agricultural product exports in general. A few patterns, however, need to be flagged here. First, in the decade of the 1980s processed food exports growth rate did not match their output growth rate. Second, during the 1991-95 period, the processed food export growth rate is more than double that of the output growth rate. Figs. II.3 and II.4 show that this happened primarily due to a spurt in exports during 1994-95. Third, the near stagnation during 1995-99 (less than a one per cent growth rate) requires a closer and more disaggregated examination, which also looks at export destinations. But the data do highlight the increasing importance of processed food exports in the period under consideration.

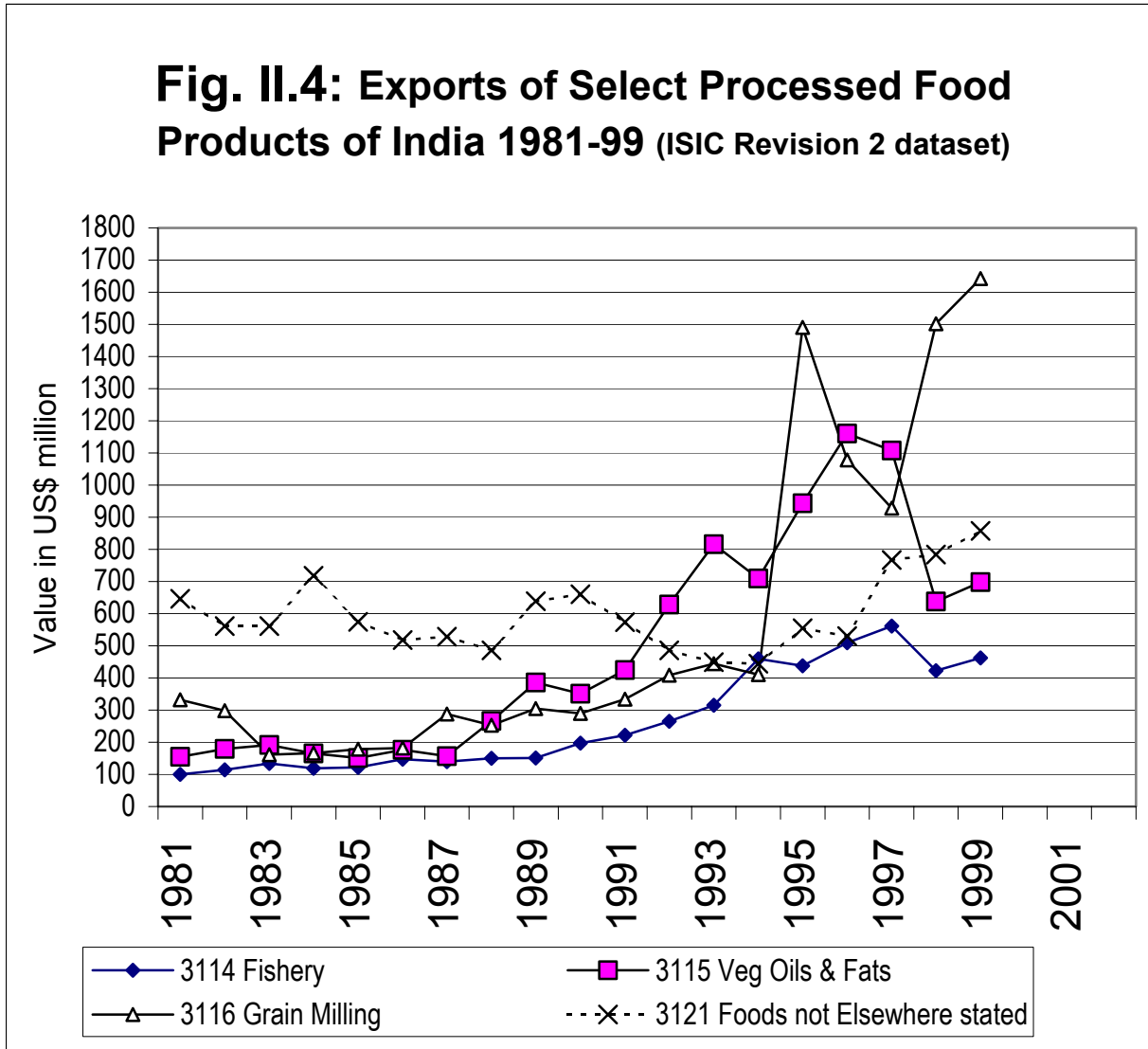
¹⁹

Processed Food includes commodity groups like (ISIC Revision-2) **311/2**: Food Manufacturing, 3111: Slaughtering, preparing and preserving meat, 3112: Manufacture of dairy products, 3113: Canning, preserving and processing of fruits and vegetables, 3114: Canning, preserving and processing of fish, crustacean and similar foods, 3115: Manufacture of vegetable and animal oils and fats 3116: Grain mill products, 3117: Manufacture of bakery products, 3118: Sugar factories and refineries, 3119: Manufacture of Cocoa, chocolate and sugar confectionery, 3121: Manufacture of food products not elsewhere classified, 3122: Manufacture of prepared animal feeds, **313**: Beverage Industries, 3131: Distilling, rectifying and blending spirits 3132: Wine industries, 3133: Malt liquors and malt, 3134: Soft drinks and carbonated waters industries, **314/3140**: Tobacco Manufactures. See Mehta, Saqib and George (2002), for greater details.

A preliminary examination of the export performance of processed food products does suggest *a priori* that the incidence of SPS regulations impacting on India has fallen mainly on food products that have undergone a higher degree of processing. In Table II.2, we present a picture of the principal food products that account for over 95 per cent of the total processed food exports from the country. We also give the total value of processed food exports in the next column for clarity. (In fact, Fig II.3 is based on this data series.)

Year	3114 Processed Fishery	3115 Veg. & Anim. Fats	3116 Grain Mill	3121 Food not elsewhere classified	3111 Meat & prep.	3113 Processed Fruits & Veg.	3118 Sugar & Refinery	3140 Tobacco	Total	Exports US\$ Million Total
1981	5.97	9.21	19.81	38.56	6.38	1.64	3.15	14.82	99.55	167.54
1982	6.91	10.87	18.14	34.12	6.13	3.25	5.27	14.75	99.47	164.42
1983	8.76	12.52	10.50	36.62	6.16	3.19	11.01	10.45	99.25	153.19
1984	7.92	11.05	11.13	48.00	6.29	3.53	1.98	9.18	99.10	149.47
1985	9.23	11.47	13.54	43.57	6.42	4.38	0.99	9.74	99.35	131.94
1986	11.28	13.52	13.97	39.73	6.66	4.20	0.08	9.89	99.38	130.38
1987	10.22	11.47	21.12	38.70	7.09	3.80	0.66	6.17	99.26	136.44
1988	10.71	18.96	18.01	34.67	7.24	3.82	0.47	5.14	99.04	140.19
1989	8.55	21.82	17.20	36.10	6.05	3.42	1.16	4.82	99.15	176.92
1990	10.79	19.22	15.86	36.17	6.14	2.82	1.13	6.52	98.66	182.49
1991	11.52	22.03	17.32	29.76	6.46	2.64	3.31	5.54	98.61	192.67
1992	11.60	27.50	17.88	21.27	5.87	2.69	5.93	6.07	98.83	228.54
1993	13.05	33.81	18.41	18.61	5.88	2.39	2.32	4.11	98.60	241.37
1994	19.31	29.80	17.26	18.66	6.62	3.21	0.81	2.31	97.99	237.97
1995	10.97	23.65	37.37	13.91	5.49	2.48	3.78	1.19	98.85	398.76
1996	12.50	28.46	26.46	13.01	5.92	2.24	7.33	1.66	97.61	407.57
1997	14.24	28.13	23.58	19.47	6.52	2.71	1.73	1.81	98.21	393.75
1998	11.08	16.74	39.39	20.57	5.65	2.86	0.14	1.78	98.24	381.18
1999	11.08	16.74	39.39	20.57	5.65	2.86	0.14	1.78	98.24	416.80

Source: Same as Table II.1.



Source: Same as Table II.1

We can draw out some broad contours of the evolutionary path of processed food exports from a careful scrutiny of the share of different food products. The share of the two categories, meat and meat preparations (3111), and fruit and vegetable preparations (3113), do not show much change over the period 1981-1999. However, after 1991, year-to-year variations are more pronounced in 3111 in comparison to 3113 and these may be related to the role of SPS regulations in different export markets.

If we consider the post-1991 period and take out the share of Tobacco manufacturing (3140), the total share of the remaining commodity groups indicates the growing importance of grain mill

products (3116). Again, the research issue, as pointed out earlier, would be to assess the impact (if any) of the SPS regulations. Interestingly, the share of food classification 3121 over the same period (1991-99) shows a decline from about 30 per cent to about 20 per cent, almost changing places with 3116. The history of agricultural exports from India is a story of considerable year to year variations, but processed food exports are of different kinds and buoyant exports to matured market would require more intensively processed food products. It is in these markets that stricter and higher than international reference standards are relevant in market access issues.

These figures suggest that in the post-economic reforms period since 1991, the indirect effect of trade liberalisation, exchange rate adjustment and relaxation of restrictions on agricultural exports have been positive and significant. A further elucidation can be observed from Table II.2 and Fig.II.4. The four selected processed food products (3114, 3115, 3116 and 3121) account for about 88 per cent of the total export earnings during 1999, that is 3-percentage points higher than the share in 1995. Interestingly, grain-milling products that comprise intermediary processed foods show significant growth during this period (Fig.II.4). The cyclical nature of exports of these processed product lines also emerge sharply from Figs.II.3 and II.4.

Thus, the pattern appear to suggest that challenges for the country in the export markets of these commodity groups are crucially linked to the processing framework.

A list of instances of selective application of SPS measures can be cited here to clarify how they have impacted on food exports from India. For example, Australia, China and Japan do not allow Indian mangoes and grapes on the ground that certain fruit flies are present. Ironically, China imposed a ban on grapes for a species of fruit fly that does not exist in India. On the other hand, USDA allows entry to a fruits and vegetables consignment only after detailed tests of the production region.

The Japanese stipulation of Vapour Heat Treatment (VHT) of fruits is yet another instance of SPS becoming the key non-tariff barrier. The technological upgrading to comply with VHT protocol is a story of investment of time and money for at least five years. This is in spite of the fact that success at the end is not assured. The introduction of a regulation by EU prescribing very low levels of Ochratoxin-A (OTA) in coffee; method and sensitivity of estimating pesticide

residue in vegetables, fruits, honey, etc. appear quite unreasonable. Another instance is the EU demand for the residue monitoring plans for the previous years in association with that for succeeding years. This stipulation will definitely deny access to the EU market for Indian agro products. The labelling stipulation in the importing country language too is a costly proposition keeping out Indian exporters. As a consequence of all these measures, costs are imposed on the exporting country without any expected commensurate return.

To sum-up, the issues of food safety regulations for a country of India's size with a wide spectrum of agro-climatic dimensions require a detailed examination in a logical framework of different processes. The need for such an examination can be highlighted if one could visualise a food market output and export matrix or the volume-value matrix with the respective shares for the country. The SPS relevant exports have strong backward and forward linkages with deep ramifications. Finally, processed food product lines depend on a host of players in both exporting and importing countries. In the following sub-section, we attempt to provide an exposition of these dimensions.

II.3 SPS Compliant Export

India has an elaborate system of quality inspection and certification before any product is exported. In recent times, more rigour has been brought into this process and the domestic system is evolving in response to the reported number of rejections of exportable commodities.. The Export Inspection Council (EIC) is the apex-designated agency that is charged with this responsibility.²⁰ For brevity, SPS compliant exports are facilitated by the EIC, which imposes a system of three types of inspection and certification, namely consignment-wise inspection; in-process quality control and a food safety management system based certification²¹.

However, for brevity we may recall that under the Consignment Wise Inspection (CWI), each export consignment is inspected and tested by the recognised inspection agencies. Samples are drawn on the basis of statistical sampling plans, inspected and tested for verifying the conformity of products to the prescribed standards. The in-Process Quality Control (IPQC) system lays emphasis on the responsibility of manufacturers/processors in ensuring

²⁰ For details about role and function of EIC, see RIS Launching Workshop Proceedings (2002).

²¹ Greater details on these quality inspection and certification system are given in Mehta, Saqib and George (2002), RIS Discussion Paper No. 39: 20-24.

consistency in quality during all stages of production by adopting quality control drills and exercising control on raw materials and bought-out components, manufacturing process, packing and final testing. Manufacturing and processing units, adjudged as having adequate levels of quality control in all these areas, are approved by EIC based on the assessments. Units approved under this system are eligible to get certificate of export worthiness without further verification of the quality of the out going consignments by EIC and random spot check of the consignments are carried from time to time. Under the simplified inspection procedure, such units have been given the option, either to issue certificate of inspection of export worthiness on their own or to obtain certificate of inspection from EIC.

In view of growing concern the world over regarding health and safety parameters of food items being imported, international standards on Food Safety Management Systems like HACCP/GMP/GHP have been developed. Based on such standards, which are being prescribed by several of India's trading partners such as European Union, etc. EIC has introduced certification of product quality integrated with the systems approach. Currently, Fish & Fishery Products, Egg Products and Milk Products are being certified under the above system.

II.4 Detention of Shipments by USFDA

Agricultural exports in the post-WTO period are dependent on import procedures in the destination country. We attempt here an examination of the detention of shipments by USFDA to gain a better understanding of the application of SPS in an importing country.

The US is probably the only country, which provides information on the detention of shipments based on a pre-inspection basis. Table II.3 provides the number of detentions by US Food and Drug Administration. It can be seen that during May 1999-April 2000, the total number of detentions by the US originating from all (52) countries was 9875, of which 860 shipments originated from India. This was the highest number of shipments rejected by USFDA that originated from a single country. The total number of detentions of shipments during December 2001-November 2002 increased to 997. This by itself is not an adequate measure of the rejection rate, and Table II.3 also gives the number of detentions per one million US dollars worth of imports from originating countries. The range of this parameter was 0.1-11.0, while the rate for India was 4.5. To examine the changes in the rate of detention over time, we estimated this parameter for recent months, i.e., December 2001-June 2002. Our results show that the number of detentions per US \$ one million has declined from 4.5 in 1999-2000 to 2.6 during 2001-2002.

Similar estimates were also conducted for specific commodity groups of US imports from India, i.e. 'Shrimps' and 'Mushrooms'. The detention rates for these sectors during 2001-02 were 0.7 and 31.6, respectively. It shows that the rejection rate of Indian 'Shrimps' is lower than the overall average rate, while the corresponding rate of 'Mushrooms' is very high.

USFDA also provides information on the causes of detention of different shipments. The results for (a) All commodities, (b) Shrimps and (c) Mushrooms are given in Table II.4. A number of observations can be made from a close examination of data in this table.

1. A significant number of Indian consignments were rejected on the basis of multiple reasons. For example, a consignment of Nishat Export (of Black Pepper) in September 2002 was rejected on the grounds of (a) Filthy or adulteration, i.e. article appears to consist of a filthy, putrid or decomposed substance or to be otherwise not fit for food, and (b) Salmonella, i.e., the article appears to contain a poisonous and deleterious substance.

Table II.3: US Food Imports and Detention of Shipments by the US Food and Drug Administration¹: Detentions and Number of Detentions per US\$ million of Imports			
Country group/country²	Export Value mill. US\$	No. of detentions	Number of detentions per million US\$ imports
May 1999-April 2000			
Total³ [52 Countries]	-	9875	0.90
Mean	-	179	1.70
Range	-	11-860	0.1-11.0
India – All commodities		860	4.50
2001-2002			
India			
A. All Commodities, Sept. 01-Feb. 02	138.82	364 (997)	2.60
B. Shrimps, Dec. 01-June 02	69.84	49 (88)	0.70
C. Mushroom, Dec. 01-June 02	0.19	6 (30)	31.58
<i>Notes:</i> 1. All Commodities, 2. The number of countries is shown in [] brackets, 3. Total number of detention is net of shipments originating within the USA and 4. Figures in parentheses represent number of detention of shipment during Dec. 01 – Nov. 02.			
<i>Sources:</i> Compiled using data from the following sources.			
1. Import detentions: US Food and Drugs Administration, OASIS Website www.fda.gov/ora/oasis/ora-oasis_ref.html			
2. Import/Export value: (a) UN trade-data tapes held at the International economic database of the Australian National university (imports), (b) Export Value of India to US: G.O.I. DGCIS.			
3. Athukorala, Prema-chandra (2002), “Asian Developing Countries and the Global Trading System for Agriculture, Textiles and Clothing”, in Adhikari, Ramesh and Prema-Chandra Athukorala (eds.) <i>Developing Countries in the World Trading System: The Uruguay Round and Beyond</i> , Edward Elgar, UK and US.			

2. Each rejected consignment was on the basis of 1.50 percentage (average) of reasons for all commodities, with a corresponding rate of 1.25 percentage for Shrimps and 1.17 percentage for Mushrooms. Hence it shows that the reasons of rejections are higher for Shrimps.
3. A large number of Indian consignments of all commodities were rejected by USFDA on the basis of (a) Salmonella, (b) Filthy, (c) Not Listed, i.e., information regarding product was not provided, and (d) Unapproved, i.e., a new drug without an approved application.

Table II.4 : Causes of Detention of Indian Shipments by USFDA	
A. All Commodities, Dec. 2001 – Nov. 02	
Causes of Detentions	No. of Shipments
FILTHY	256
UNAPPROVED: NET DRUG WITHOUT APPROVAL	174
SALMONELLA	161
NOT LISTED	107
MFRHACCP	88
NO PMA/PDP	87
LIST INGRE	78
NUTRITION LABEL	72
LACK N/C	51
PESTICIDE	43
UNSAFE ADD	37
UNSAFE COL	35
DIRECTION: HOW TO USE ETC.	28
AGR RX	24
COLOR LBLG	17
DR QUALITIC	16
DRUG NAME	16
REGISTERED	16
INSANITARY	15
LACK FIRM: NAMES ETC.	13
NO 510 (K)	12
SACCHARIN	12
COSMET LBLG	11
FALSE	11
USUAL NAME	11
LABELING	10
CSTIC LBLG	8
FLAVR LBLG	8
COSM COLOR	7
NEWVET DR	7
INCONSPICU	6
RX LEGENT	6
DIETRYLBL	5
FOREIGN OB	5
NEED FCE	4
CONTAINER	3
DE IMPGMP	3
HOLES	3
POISNOUS	3
PRESERVE LBL	3
RX COMPOUND	3
COL ADDED	2
JUICE %	2
PERSONALRX	2
UNDER PRC	2
ANTIBIOTIC	1
BACTERIA	1
HEALTH C	1
IMPTHACCP	1
NO ENGLISH	1
NO PROCESS	1
NO REGISTER	1
SOAKED WET	1
WARNINGS	1
YELLOW H5	1
TOTAL	1493 (997)

B. Shrimps, Dec.01 - Nov.02	
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SALMONELLA	67
FILTHY	18
INSANITARY	15
NO ENGLISH	2
UNSAFE ADD	2
BACTERIA	1
LACKS FIRM	1
LACKS N/C	1
LIST INGRE	1
NUTRIT LBL	1
USUAL NAME	1
TOTAL	110 (88)

C. Mushrooms	
PESTICIDE	28
UNSAFE ADD	5
UNDER PRC	2
TOTAL	35 (30)

* Figures in parentheses represent total number of detained shipments for the period December 2001-November 2002. Total number may not tally with sum of individual causes, because in many shipments, more than one cause is mentioned for detention.

Source: USFDA Website.

For definition of causes of Detention, See USFDA Website.

4. A large number of Indian consignments of shrimps were rejected due to (a) Filthy, (b) Salmonella and (c) Insanitary, i.e., an item prepared, packed or held under in-sanitary conditions.
5. Out of 30 rejected Indian consignments of Mushroom, 28 of them were rejected due to Pesticide, i.e., bears or contains a pesticide chemical which is unsafe.

III. Exploring Select Product Lines

We have already seen in the preceding section that processed food products are gaining in importance in the export basket of India. There appear to be two key issues relevant for SPS compliant exports: (a) the pre-shipment inspection and certification by the exporting country and, (b) the import procedures and detention in the destination countries. Since, there are no uniform or homogenous product lines, there are wide variations in relevant food safety norms and over time, food safety standards have tended to become more complex and vary substantially amongst countries.²²

In what follows, we attempt to explore the application of SPS measures for a few select product lines. The selected product lines are Poultry products; Marine products; Mango Pulp, Peanuts and Mushrooms, which have contributed substantially to India's processed food exports in recent years.

III.1 Poultry²³

It may be appropriate to recall that two years back, India was de-listed from the EU's list of approved countries for import of egg powder into EU because of its non-submission of a Residue Monitoring Plan (RMP). It has been the strategy of EU countries to introduce newer, and stricter residue limits every time a need arises to restrict imports from developing countries like India. The issue of residue limits and the Residue Monitoring Plan itself has indeed been used as an SPS measure very strongly by developed countries like EU as well as the USA. On the other hand, India also suffers since no domestic agency took the responsibility of preparing the Residue Monitoring Plan for animal products including egg powder, and the matter was thrown from one Ministry/department to other. If the documents had been clearer, the demarcation of responsibility and implementation of required action could have been quite easily done, which again highlights the need for good documentation.

²² A typology of food safety regulation that impact on agricultural and processed food exports is given in Roberts, Donna, Timothy, E. Josling and David Urden (1999) "A Framework for Analyzing Technical Trade Barriers in Agricultural Markets", Technical Bulletin No. 1876, Economic Research Service, US Deptt. Of Agriculture, pp.16-17.

²³ We acknowledge with thanks, (i) inputs and (ii) hours of discussion with Mr. S.K. Singh in formulating this sub-section.

A second type of SPS measure employed by the developed countries is the granting of equivalency to countries like India. EU and USDA have not made the effort to grant equivalency to Indian standards for egg powder. Even after four years of having submitted the list of plants to be notified by EU, they have not constituted a commission to inspect these plants in India, notify them and grant them equivalency.

A third type of SPS measure used by some countries is certification of labs. The test certificates issued by Indian laboratories are invariably not accepted in EU and other developed countries as these labs are not accredited to the labs of developed countries, even though the Indian labs follow the same testing methods and protocol for testing the samples.

Box 1: Indian Poultry Sector: Select Features

While the importance of agriculture in national income has been declining, the importance of livestock in general, and the poultry sector in particular, has been increasing. For instance, the share of agriculture (including livestock) in GDP declined from 34.7 per cent in 1980-81 to 26.1 per cent in 1996-97, but the share of the livestock sector increased from 4.8 per cent to 6.0 per cent. This relatively slower growth of agriculture resulted in the increase in the contribution of the livestock sector to agriculture from 13.8 per cent to 23.0 per cent. India produced 37 billion eggs in the year 2000-2001 and ranked fifth in the world in egg production. Similarly the country produced more than 1000 million broilers in the same year – becoming the eighteenth largest producer of the world.

A distinctive feature of Indian poultry is that it is self sufficient in terms of availability of several globally known brands of commercial hybrid chicks, essential equipment and machinery, medicines and vaccines, compounded poultry feed, disease diagnosis, services such as poultry training programmes, and technical and skilled manpower. The industry is supported by a strong genetic base, where the productivity levels of broilers and layers are equal to the productivity levels observed in developed countries like EU and US. India is also one of the few countries in the world, which has put into place and sustained an SPF egg production project.

The size of the broiler farm has in general increased. During the eighties, broiler farms have had on average a few hundred birds per cycle. Today, units with less than 5000 birds are very rare, while units with 10 to 15 thousand birds per week cycle are common. In terms of technology absorption too, farmers have tended to adopt newer technologies of feeding and watering systems and management of health and hygiene. Small units are at a disadvantage because of high feed and transport costs, expensive vaccines and veterinary care services, and non-availability of credit. Some small units are reported to be shifting from layer to broiler production because the output in broiler units can be realised in six weeks. And slowly a system of contract farming is seen emerging in these small broiler units: chicks, feed and medicines being supplied by the integrators.

India's participation in the world trade of poultry has so far been negligible. The world trade (exports) in poultry in 1998 amounted to 5750 thousand tonnes (valued at \$10,000 million). However, India's poultry exports amounted to a meagre 407 tonnes (\$21 million). But it has very great potential in the near future.

Eggs and eggs-based products account for most of India's poultry exports. Exports of hatching and table eggs have increased dramatically due to a higher demand from the Middle East and South-East Asian countries – from 500 metric tonnes (Rs. 6.11 million) in 1985 to more than 65000 metric tonnes in 1998 (Rs. 608 million). Similarly, exports of egg powder increased from a meagre Rs. 0.4 million in 1990 to more than Rs.500 million in 1996. After 1996, however, exports of egg powder fell by 16 per cent in 1997 and 20 per cent in 1998. The factors affecting its

exports are reported to be the SPS measures of the European Union. India also supplies specific pathogen eggs to the European Union for pharmaceutical purposes.

Kuwait, Oman, Saudi Arabia, UAE, and Yemen have been the major importers of India's table and hatching eggs. Similarly, Germany, Austria, Japan, Netherlands, and the Republic of Korea have been the most important markets for India's egg powder. Due to a downturn in sales to the EU and a decline in demand in Japan, egg powder exports declined sharply in 1998. Exports of egg powder from India are reported to have slid down further in 1999 and 2000.

India also exports live poultry in the form of Day Old Chicks (DOCs). The main overseas export markets for India's live poultry are countries of the SAARC region.

Issues relating to animal welfare and environmental pollution by poultry units have been of increasing concern in developed countries like the EU and US. But in India, these issues are not yet critical, although they are discussed at length at various seminars and discussions on poultry production. But considering the globalisation and international trade in poultry products, these issues may assume significance after a few years because of pressures from importing countries like the EU.

The Indian Poultry sector is facing a number of problems. A major problem affecting the Indian poultry industry is the lack of basic infrastructure – storage and transportation include cold chain. As a result, there are wild fluctuations in the prices of poultry products. A second problem is an inefficient marketing system. Currently, poultry products pass through various intermediaries before reaching the final consumer. The presence of so many intermediaries harms both the producer and the consumer. The producer does not get a remunerative price for his product, while the consumer pays a high price because of the cascading of margins with so many intermediaries. A third problem relates to prices of feed resources. Maize or corn plays a major role in broiler production, as it constitutes 50-55 per cent of broiler feed. As the broiler industry is growing at 15 per cent per annum, the demand for maize is likely to increase. The required policy measures are: (a) to improve infrastructure facilities which will help not only to stabilise the price of poultry products in the domestic market, but also make them available in far flung areas; (b) to provide an efficient marketing channel that gives a remunerative price to the producer, i.e. the marketing set up of the country should also grow on professional lines which may include traditional channels of traders to some extent in the intervening period; and (c) to increase maize production, by using GMO varieties of seed, or alternatively find other sources/types of feed ingredients which can replace maize.

The US importation rules, clearly state that importation of poultry and poultry meat products from other countries can be on various grounds, which favour domestic producers. The Food Safety and Inspection Service (FSIS) can suspend the eligibility of another country if it feels that an emerging sanitary measure is to be implemented to address a hazard that is so severe that no product can enter from a foreign establishment until a control is in place. In a second situation, if the other country does not provide satisfactory documentation of equivalent sanitary measure or if the FSIS audit reveals that the exporting country is not implementing a public health sanitary measure in the manner that the FSIS determined it to be equivalent, they can permanently stop eligibility of that country for export. They can further take action against a particular country if they feel that their products are adulterated or misbranded on on-site audit or because of Port of Entry re-inspection, etc. These are SPS measures in different garbs, which are or can be used for stopping exports from developing countries like India.

We should also keep in mind the environmental and welfare issue adopted by the EU. Legislation on nitrate levels in Denmark, and the growing trends towards organic production and their impact on poultry housing costs would bring in new issues in the shape of SPS measures. In Germany, animal welfare is becoming an important issue. There is a general agreement to limit the bird density of broilers while small cages are to be banned, and these rules are going to be stricter in future. After the BSE crises of late 2000, which damaged the reputation of EU's food and farming industry, Salmonella control by costly vaccine in laying hens has become a standard practice. In France, new manure disposal regulations and the traditional method of producing animals, slowly and at low density, will be an important animal welfare issue in the future. In the Netherlands, high livestock density accompanied by tough regulations on manure disposal has resulted in an eco-tax, which has increased the cost of gas and electricity there. They are trying to bring in tougher rules on ammonia emissions and the current policy is to ban laying hen cages. There are directives to regulate broiler bird densities and production.

Similar examples can be given from Spain, Hungary and Poland where these issues are gaining ground and will be used in the future as SPS measures affecting developing countries like India. It has been observed, that Indian egg processors are many a times asked to provide certificates for Foot and Mouth disease and anti-radiation, which have nothing to do with poultry production, if there is an evidence of this disease in any part of the country. The SPS Agreement in this context clearly talks of disease-free zones. The Article 6, clearly lays down that members shall take into account the level of prevalence of specific disease or pests, the existence of an eradication or control programme or proper criteria/guidelines which may be developed by relevant organisations.

Finally, whereas Article 9 of the SPS Agreement talks of technical assistance or special and differential treatment to developing country members for phased introduction of SPS measures, these are not adhered to. Sometimes the non-availability of proper protocols, equipment and domestic sampling procedures also hamper the work of certification by the local testing labs. It is essential, therefore, that attention be paid to the supply-chain at each stage to maintain proper health and hygiene requirements.

The poultry industry consists of producers of both layers and broilers. The production of eggs, and chicken meat represent different stages, starting from the Great Grand Parents or Purelines, which are followed by the next generation of Grand Parents and Parent Breeding Farm. Up to this stage, the science involved is pure genetics followed by sound principles of poultry management. Hatchery is the hub area both of broilers and layers, where sanitation and hygiene play a very major and critical role. This is one area where, unless a lot of care is taken, the chicks produced from incubators and hatcheries can be infected with different diseases. These will not only affect the health of the birds, but can also create food safety problems for the consumers. There is a very close inter-relationship between such stages and each link has to be protected from contamination.

The production chain can be vertically integrated or several independent firms, depending on their respective core competencies, can undertake production at each stage (producing Purelines, Great Grand Parents, and Parent Stock). Similarly, independent firms can also produce day-old chicks in their hatcheries, which can be established by a parent-breeding farm. Food, in the form of broiler chicken and eggs, can be produced by the integrator himself or it can be purchased from outside sources (e.g. from farmers).

In India, vertical integration has not taken root very strongly. There are only a few companies, such as the VH Group of Companies, that are involved in all the activities of the supply chain in a typical integrated operation. Independent producers of Grand Parents and Parents, and a large number of hatchery operators run most of the poultry operations. Similarly, integrators produce poultry feed, with many companies like Hindustan Levers, Godrej, Uttara Poultry Feeds, Poshak, etc., involved in feed production. There are a large number of commercial farmers producing layers and broilers. Further processing of chicken and eggs is still at a nascent stage.

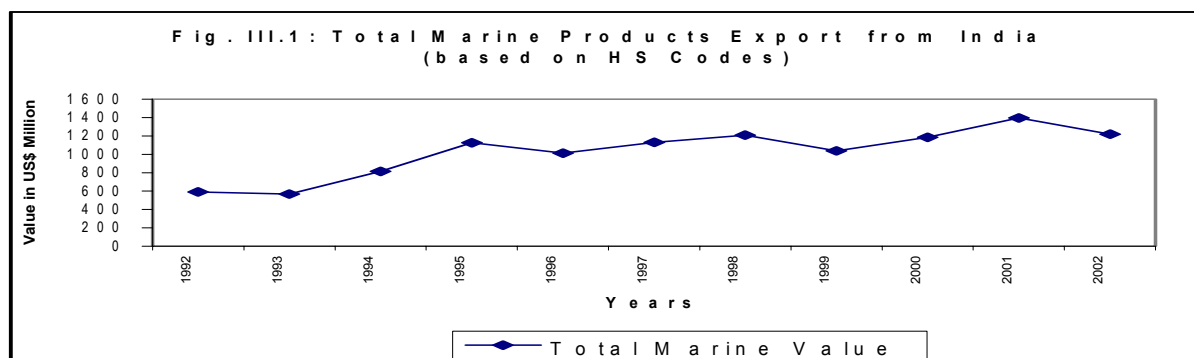
There are about half a dozen egg processing plants, of which three are currently in operation and two of them are HACCP compliant, meeting the international standards. During 1996, all 6 plants were exporting egg products to EU and other developed countries. But, with the imposition of the new residue limits for pesticides, and the requirement for submission and

execution of RMP by India as country, egg powder exports declined sharply. According to industry sources, India has lost an export market of egg powder of more than Rs 100 crores during last three years. This greatly lowered capacity utilisation of almost all units, and led to the closure of 3 units. After 3 plants gained accreditation for higher standards, Egg Powder exports started picking up again in 2002. To become HACCP compliant, each unit had to invest around Rs 1.5 to 2.00 crores, which is around 5 per cent of the total investment cost. The new plants need an in-built lab to check the validity of compliance, and various inputs and skilled labour, all of which raise operating costs. With no domestic market for egg powder, the existence of non-operating units, low capacity utilisation of operational units and their higher operating costs adds up to a huge burden on the industry.

A few firms, whose plants meet international standards and who also supply to multi-national food chains like Domino's, Pizza Hut, KFC and TGI Fridays, do further processing. About half-a-dozen plants in operation also do whole bird slaughter and processing. About 97 per cent of the chicken is still sold live in '*Mandies*' (wholesale markets). In these '*mandies*' or market yards like Gazipur of Delhi, more than 2,00,000 birds are traded everyday. The broilers are still sold live, and that too on a score basis (20 numbers make one score). Some layer farms have started egg grading, washing and packaging for export purposes. However the majority of the eggs are still sold in small numbers by small and marginal operators. This complex situation, with many players in the chain, raises difficult challenges in terms of moving to a vertically integrated system. Food safety, however, becomes a major problem as there are so many handlers doing different jobs, and many a time they may not even be aware of the food safety requirements. Many companies who operate at the primary breeding stage where the rest of the chain is integrated and control is centralised may be in an advantageous position in terms of food safety, relative to those that are not integrated. In countries like India, where the live market still dominates in the chicken industry, with a large number of butchers and processors, standards of food safety are difficult to meet. Further, there are no documented guidelines - either voluntary or mandatory – that can be enforced. To achieve an acceptable level of confidence in food safety, appropriate steps pertaining to risk assessment need to be undertaken.

III.2 Marine Products²⁴

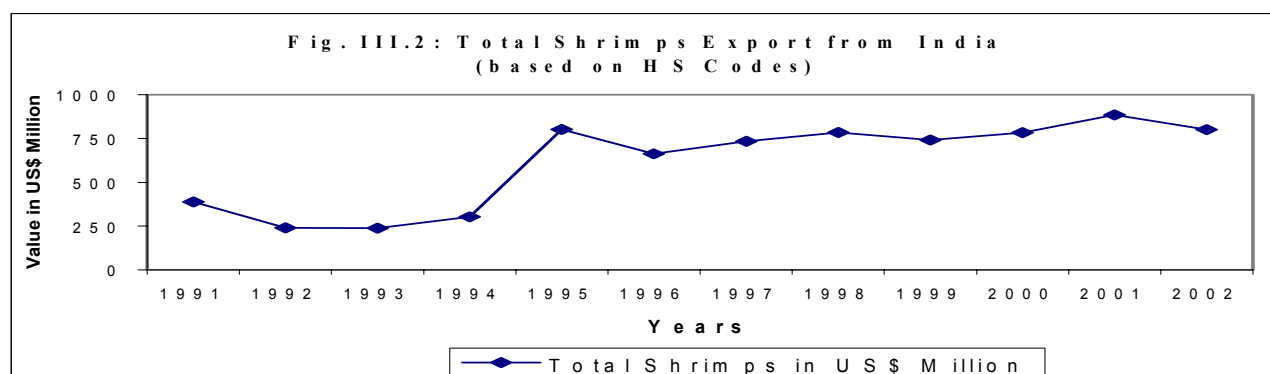
Marine products have long been the most buoyant among Indian export lines, following the imposition of stringent quality controls for marine products after the SPS regulations came into force. The demand for stringent and high hygienic standards in the production and processing facilities greatly increased, after the stipulation of Hazard Analysis Critical Control Point (HACCP) by United States Food and Drug Authority (USFDA), ISO9000 and other European Community directives (especially EC91/493), and the EC ban on Indian marine products in 1997.



Source: CMIE, *India Trades*. Note: Shrimps = HS Code 030613+030623+05119106+16052000

Source: CMIE, *India Trades*

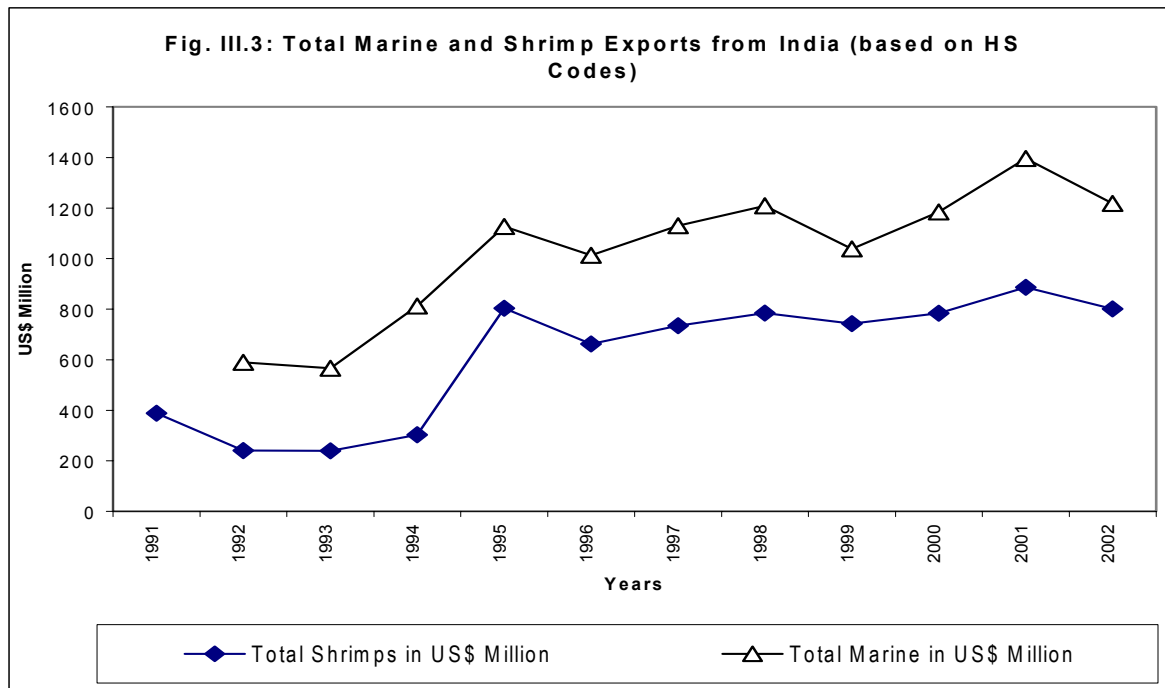
The impact is most clearly felt in the production of individually quick frozen (IQF) and other value added frozen items for export to the major overseas markets.



Marine products, on account of their health attributes and high unit value, are claimed to be one of the fastest moving commodities in world markets. The world market for seafood is reported to have doubled between 1987/88-1997/98, reaching the US\$49.32 billion mark, of which India had a 2.4 per cent share. India has depended on Shrimps as the major export product while the

²⁴ We acknowledge with thanks inputs and intense discussion with M. Saqib in revising this and the following sub-section.

world market is fast changing the composition of the seafood basket. Consequently, Indian exporters are attempting to penetrate into the new markets of Europe and South East Asia. But, in value terms, frozen Shrimp remains the largest marine food export product accounting for about 69.50 per cent in the total value of marine product exports from India during 2001-02, showing a slight decline from the over 71 per cent share in 1995 (www.mpeda.com/indiaseafood.india.html).



Note: Shrimps: HS 030613+030623-05119106+16052000

Source: CMIE, India Trades, and DGCIS, Foreign Trade Statistics of India: Principal Commodities and Countries, G.O.I.

The Indian marine products exports are driven primarily by the Japanese and the European Union (EU) markets (Fig. III.4). For example, exports to Japan increased from US\$251.49 million in 1987/88 to US\$641.68 million in 1997/98, whereas during the same period exports to EU grew from US\$60.76 million to US\$113.80 million. Since then, marine products exports have grown further due to rapid supply expansion through shrimp farming and the introduction of several resource-specific vessels to enhance marine fish landings. In 2001-02, Japan (30.56%), USA (23.9%) and EU (19.31%) together accounted for about 74 per cent (by value) of India's marine product exports, while they had accounted for about 71.4 per cent in 2000-01. The value of marine product exports to Japan declined by almost a 32 per cent from US\$562.75

million in 2000-01 to US\$383.07 million in 2001-02. On the other hand, exports to USA and EU markets increased during this period by almost 25 per cent.

Box 2: Shrimps and Marine Export Environment

About 85 species of Shrimps are known to exist in Indian waters, of which 55 species are reported either as commercially important or having considerable demand in the local as well as international market. Among these *Penaeus indicus*, *P.monodon*, *P. merguensis* are in high demand and are candidate species for cultivation. The post larvae and juveniles of these species get into the estuarine waters where they grow and later migrate back to sea for reproduction. They breed in the sea at different depths, Adult *P.indicus* are found distributed in the deep waters. They normally spawn in a depth ranging from 50-69m. Gravid *P. monodon* is reported to be found in the sea at a depth ranging from 50-100 m. *P. merguensis* prefer muddy bottom in a depth range of 20-40 m and shallow coastal waters for matting and spawning.

Distribution of Cultivable Shrimp

No.	Species (FAO)	Common name (FAO)	Habitat	Distribution
1.	<i>P.monodon</i>	Giant tiger prawn	Trawled over mud or sand bottom to 110 m. Juveniles occupy shallow estuarine waters, adults in deeper waters	Indo-west pacific – coast and South East Africa, India, Pakistan to Japan, the Malay Archipelago, Indonesia, New Guinea and Northern Australia.
2.	<i>P.semisulcatus</i>	Green tiger prawn	Trawled in depths to 130 m over sandy or muddy bottom. Adults to occupy deeper waters while juvenile forms are found in shallow waters generally associated with sea grass beds.	Indo-west pacific – coast and South-East Africa, Red Sea to Japan, Korea, Malaysia and Indonesia to northern Australia. Established In the eastern Mediterranean following migration through the Suez Canal.
3.	<i>P. indicus</i>	Indian white prawn	Seen in depth upto 90 m very muddy or sandy bottom. Post larvae and juveniles inhabit shallow estuarine waters as part of their life cycle	Indo-west pacific – coast and South East Africa to south China through Malaysia and Indonesia to New Guinea and northern Australia.
4.	<i>P. merguensis</i>	Banana prawn	Seen in muddy bottom From 10 to 45 m depth. post larvae and juveniles enter shallow estuaries.	Indo west pacific – from Persian Gulf to Thailand, Hong Kong, Philippines, Indonesia to New Guinea, New Caledonia and northern Australia.
5.	<i>P. japonicus</i>	Kuruma shrimp	Inshore waters to 90 m deep over sandy mud and sandy bottom.	Indo west pacific- east coast of South Africa, Red Sea, Indian seas, Korea, Japan, Taiwan, Malaysia Philippines, Indonesia New Guinea Fiji Island. By migration through the Suez canal to the eastern Mediterranean north Australia.

Shrimp can be grouped into penaeid and non-penaeid. These two groups of Shrimps can be easily separated. The pleurae on either side of the second abdominal segment overlap the pleurae of the first and third segments in non-penaeids, while in penaeids they overlap only the third segment. The first three pairs of peraeopods are chelate in penaeids. While in non-penaeids only the first two pairs of peraeopods are chelate. For transferring sperms the male penaeids Shrimp has petasma and for storing sperms the female has thelycum. In non-penaeids such organs are

absent. The females of non-penaeid carry eggs in their pleopods as a cluster. While females of penaeids lay eggs directly in water.

Recognizing these biological characteristics, a scientific prawn farming system was introduced. Consequently, the export of Frozen Value Added Shrimp in frozen shrimp exported during various years have exceeded in volume terms in spite of a decline in the international price for Black Tiger Shrimp. However, increase in aquaculture production, higher incidence of disease and the practice of early harvest in many competing countries have all led to a lower value realisation from the Shrimp category.

India with a long coast line of 8129 kms, two million sq. kms of Exclusive Economic Zone and 1.2 million hectares of brackish water bodies, offers vast potential for the development of fisheries. Fishing efforts are largely confined to the inshore waters through artisanal, traditional, mechanised sectors. About 90% of the present production from the marine sector is from within a depth range of up to 50 to 70 metres and the remaining 10% from depths extending up to 200 metres. While 93% of the production is contributed to by the artisanal, mechanised and motorised sector, the remaining 7% is contributed to by deep sea fishing fleets confining their operation mainly to the Shrimp grounds in the upper east coast.

In the context of stagnating catches of shrimps from the traditional fishery resources, MPEDA was given the mandate for development of prawn culture as the only alternative for generating additional raw material for augmenting exports from the country since 1979. It plays a significant role in Indian Aquaculture based on well laid out MPEDA plans as well as popularisation and implementation of various schemes for the promotion of export-oriented aquaculture in the country.

Source: www.mpeda.com/aquaculture/shrimpc1.htm.

Given the dominance of these markets in total shrimp exports from India, the importance of quality control becomes critical. Processed marine products differ widely, and deteriorate rapidly in tropical conditions. The EC directive no. 91/493, dated 22 July, 1991 that came into force from 1 January, 1993 made it mandatory to comply with specified health conditions for the production and placement of these products in the EU markets, and in August 1997, it banned fishery products from India.

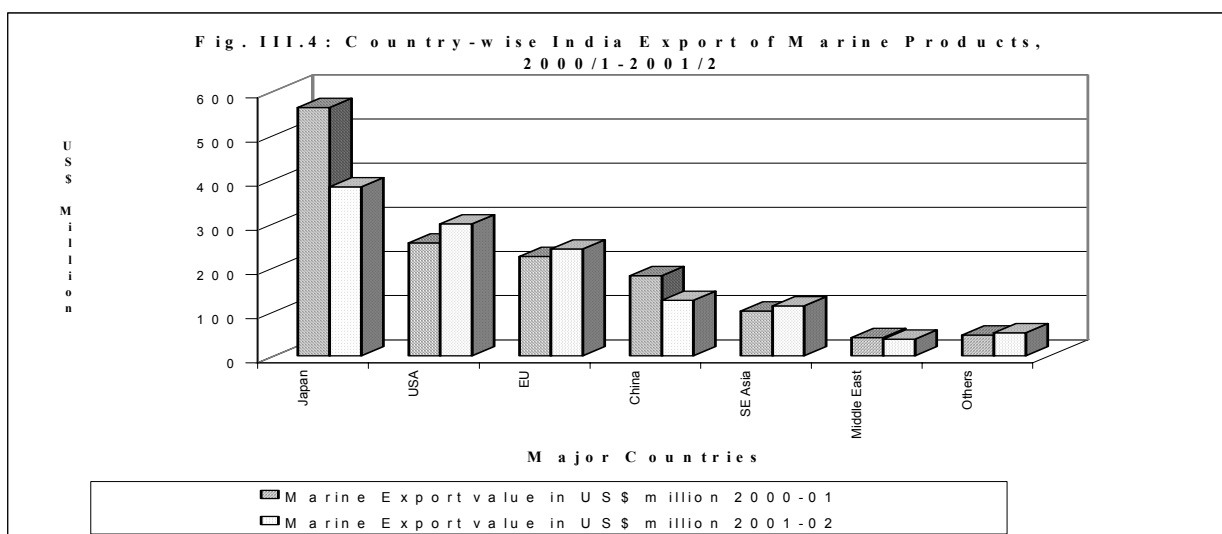
This precipitative action was justified by the EC on three primary grounds:

- Serious deficiencies with regard to infrastructure and hygiene in the fish processing establishments;

- Potentially high risk for public health given the conditions of production and processing of fisheries products;
- Contaminated by micro-organisms, which may constitute a hazard to human health.

On the other hand, USFDA came out with a new version of the HACCP based inspection proposal for seafood on 28 January, 1994. As described earlier in Section II.4, after a series of public audits and publication of the inspection procedure, the mandatory nature of USFDA was made clear. The Government of India responded to these developments by taking important steps to maintain the highest quality standards based on the health safety regulation requirements of the importing countries.

The Seafood Exporters Association of India claims to have spent US\$25 million on upgrading their facilities to meet the food safety regulations of the importing countries. The EC standards are higher than the HACCP standards and compliance requires going through the process of gaining EC approval of plants. The EC approval involves, in essence, a series of domestic legislative and EC adjudicative steps.²⁵ Though the domestic regulatory regime has been made compliant to WTO stipulation, ECs adjudicative role has been subjected to critical examination



and has given rise to conflicts.²⁶

²⁵ Details can be found in Mehta Rajesh, M. Saqib and J. George (2002).

²⁶ For a specific case in marine exports from India, see the Box 3 “Seafood export dead lock ends” and “Regulating Exports”, Economic and Political Weekly, Vol.37, No.40, 5 October 2002:4085.

Source: www.mpeda.com/indianseafood/india.html.

Box 3: Seafood Export Deadlock Ends

The deadlock between marine food exporters and government has been resolved with the latter accepting exporters' demands like the setting up of testing laboratories. In response, exporters have decided to lift the curbs they imposed on purchase of Shrimps from Friday.

The government has agreed to create a detailed road map to tackle the problem related to antibiotic residue contamination in Shrimp and Prawn. The trade has agreed to work with the government on the issue.

The government proposal envisages the setting up of 25 testing laboratories in coastal states at an approximate cost of Rs. 75 crores. The government has also agreed to lift the ban on five processing units that were suspended from export after Spain rejected some of their consignments in September due to antibiotic residue contamination. The government has consented to withdraw the order on 17 processing units currently under consignment inspection.

Exporters said the central government has decided to put in place a law prohibiting the use of antibiotics in aquaculture, including hatcheries and farms and other segments of marine products, after discussion with state governments and central authorities. An awareness programme on monitoring usage and testing of antibiotics would be taken up on a war footing.

The Commerce Ministry would discuss with the European Union (EU) for harmonisation of testing standards and protocol between India and EU member states and the EU block.

The onus would now be on state governments to put forward concrete proposals to develop infrastructure in the States.

The Rs. 6000 crores marine export industry was at the crossroads with the Ministry of Commerce banning five exporting units in the last week of September. To combat the move, Seafood Exporters Association of India (SEAI) had decided to stop buying Shrimps without a competent authority certifying non-use of antibiotics from October 17.

Source: Business Standard, Kolkata, 19/20 October, 2002

The adjudicative problems with quality compliance can be looked at from three broad perspectives:

1. Pre-processing, including Shrimp aquaculture and handling of raw Shrimp at various stages, such as harvesting, sorting, etc.
2. Processing, wherein water quality, source of water for ice making (62 tests to ensure water hygiene), infrastructure (size of the wash room) and transportation utilities come in for sanctions.
3. Post-processing, including testing, packaging and marketing activities.

A case study indicates that Indian exporters have to incur large costs if they want to access the upper quality market. This heavy cost burden involves both fixed and variable cost components. Given the small and medium size of most processing units, an additional fixed investment to the

tune of Rs. 1-2 crores per unit for upgrading, often becomes prohibitively high in the absence of a well-timed and concessional loan facility.²⁷ These plants, it may be recalled, are not exclusively dedicated plants, and with no assurance of market access even if this kind of large investments are made to upgrade infrastructure, many existing players will find it impossible to continue in the business.²⁸

*Interestingly the overhead constituent of the variable cost component of compliance for a medium size plant here is estimated to go up by a factor of 5.*²⁹ According to SEAI, the compliance cost for meeting the EC norms is 15-40 per cent of value for new units, with the cost being higher for existing units. It is estimated by MPEDA that only two units in three may be able to upgrade themselves to the EC norms, while the rest would be forced to close down and exit from the business.^{30, 31}

Thus, there are issues of sustainability in the marine export business. While, exporters have been pleading – so far unsuccessfully- for permission to move into deep-sea fishing, the government is seriously concerned about the fragile marine eco-system in the Shrimp habitats. Aquaculture is one available alternative, and MPEDA is assisting it with provision of technical assistance (see Box 3). The total area under Shrimp farming at the end of 2001-02 was estimated at 1,35,077 hectares. Of this, more than 50,000 hectares is devoted to traditional shrimp farming practices in the states of Kerala, West Bengal and Karnataka. The remainder is under scientific farming, with the active assistance of MPEDA. The area potentially suitable for Shrimp farming along the coast in India is estimated to be 1.2 million hectares, of which only about 10 per cent is currently being utilised. There is therefore much scope for improving the production.

Environmental issues have emerged in aquaculture too, but these involve domestic environmental concerns rather than international sustainability issues. The concerns arose in view of the reported ecological and environmental effects of aquaculture in Southeast Asian countries. Experts, however, suggest that, as far as India is concerned, these concerns are misplaced, arguing that apprehensions that Shrimp farming causes degradation of the coastal zone lack any strong scientific backing. In fact, the setting up of aqua farms in the coastal zone has helped to protect the zone, as most of such units have taken care to construct proper granite bunds on the outer areas facing the sea coast. In a way, these farms protect the coastal zone against sea-erosion during the monsoon. Aquaculture units are set up in fallow areas where

land is inundated with saline or brackish water, and they do not encroach on traditional fishing or farming zones.

Concerns have also been raised about the acute shortage of drinking water in the coastal areas and there have been suspicions that aquaculture may have contributed to this. As the Shrimp farms are mostly located in hard clay soils that have very little the seepage, this fear too appears to be misplaced. Unlike countries like Taiwan or the Philippines, India does not use groundwater for aqua-culture. and As imported and costly seed is used, there are incentives to use resources carefully, and hence aquaculture tends to check environmental pollution and degradation. Effluents from Shrimp farms are biodegradable, but intensive culture systems aimed at high levels of production per hectare can generate pollutants in the form of heavy metals (mercury, cadmium), pesticides and petroleum products. This has led the Government of Orissa to ban aqua-culture around the Chilka Lake. The solution to this problem is to discourage intensive culture systems and MPEDA, in its technical assistance programmes, recommends a sustainable farming system..

In fact, aquaculture provides an environmental win-win situation in coastal Kerala, where rice and shrimp crops can be rotated on the same land. In fact, this has been traditionally practised in that area. Aquaculture cannot be practiced during the monsoon season, and takes only three to four months. On the other hand, rice can be grown only during the monsoon. It is a fact that some aquaculture farmers have purchased land at a premium from traditional agriculture farmers, and to that extent there is a shift out of agriculture. This trend should be checked, at least in the interior regions, and this can be done by the states concerned through the Land Utilisation Act. The main environmental issues for aquaculture are, in fact, of a different kind. For example, degradation of aquaculture land due to pesticide residues discharged from agricultural land is threatening aquaculture activity. Effluents from industrial belts along the coast may also contribute to such degradation. The fact that fish cannot survive in polluted water can assist policy makers, who can identify areas needing corrective measures by looking at the aquaculture units in the area.

We have obtained the following average costs for aquaculture from Kaushik and Saqib (2001). Capital costs for a 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 loans -Rs.60 per kg and miscellaneous costs-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 quite labour intensive (650 man-days per hectare as compared to 50 man-days in traditional farming), so that it can generate considerable new employment. In Orissa, exporters claim that 8 per cent state government sales tax is a burden, which falls even on exports, thus weakening their competitive position in export markets.

Summing up this discussion on marine product exports (especially shrimp) and the impact of SPS measures, it was found that the value market share of Shrimp and its preparations from India declined following the 1997 ban by EU and the subsequent threat by USA relating to the Turtle Extruder Device (TED). Although, Shrimp exports were 69.50 percent of the total value of marine export lines during 2001-02, the unit value realisation remains low. This is due mainly to the high compliance cost of SPS measures that are estimated to increase operating expenses by a substantial factor.

In the absence of any assurance of market access to developed countries, exporters are exploring other markets. Given India's long coastline and the availability of distinct marine life, especially the Tiger Shrimp, the scientific dimensions of the sustainability of aquaculture should be assessed from the view point of the economic viability of small and medium enterprises (SMEs). SMEs enhance social welfare, and there is scientific knowledge that is enshrined in the indigenous system of marine husbandry. The future of an entire social group dependant on marine/fishery for their livelihood is determined by choices made by a large number of consumers, business houses and government officials. This is an issue that must be brought to the top of the trade agenda.

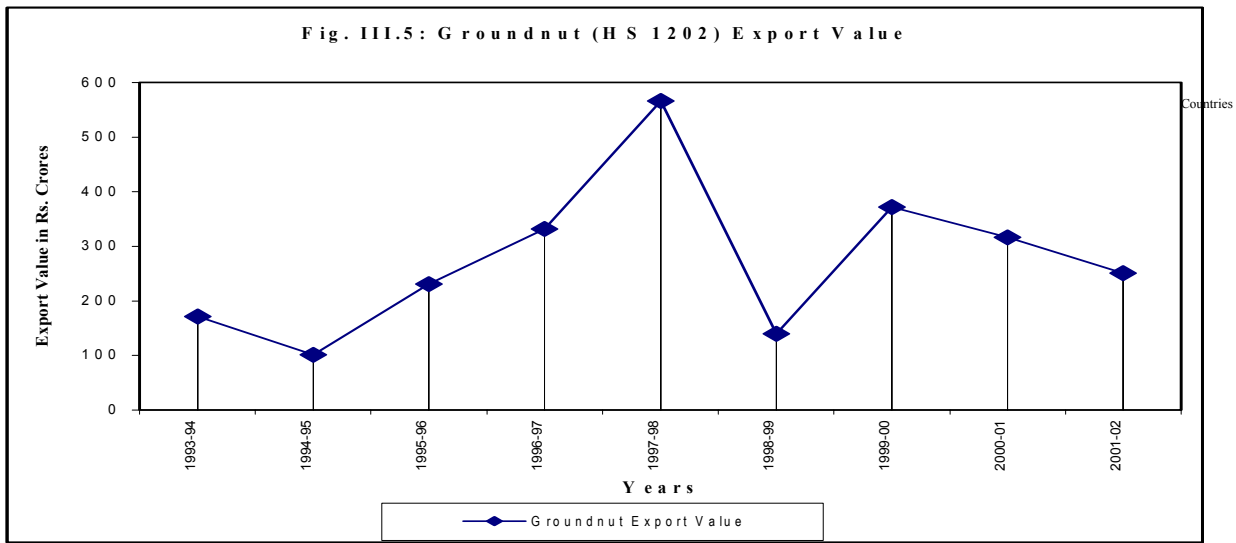
III.3 Peanuts (Groundnuts)

As discussed in Section II.1, peanut exports are handled by APEDA, and forms a major part of the commodity basket in the broad category "Other Processed Products". We intend to use

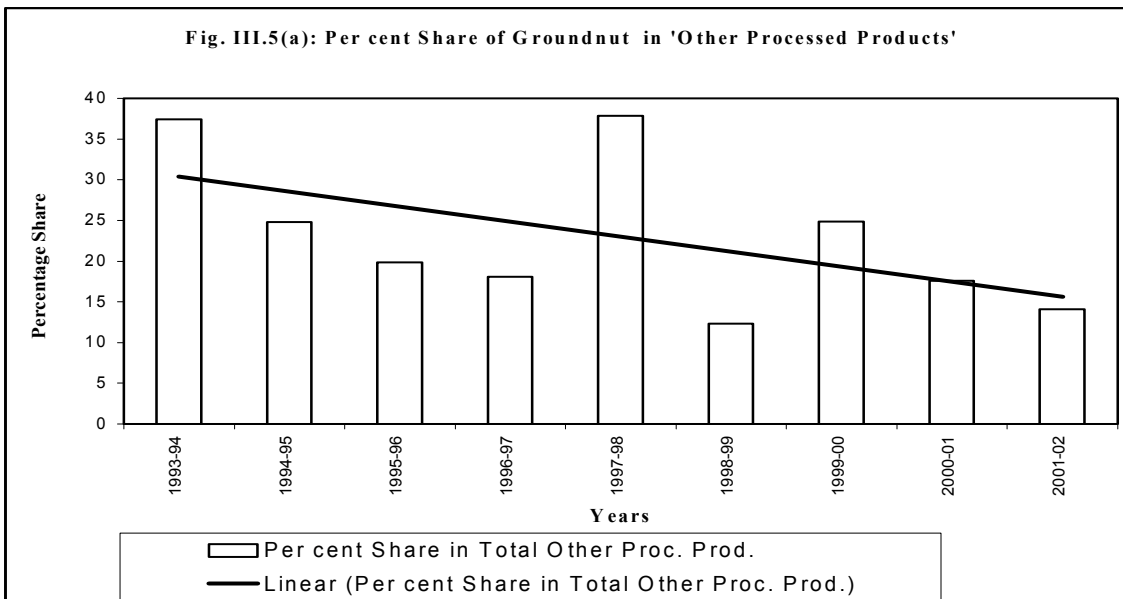
Peanuts and Groundnuts interchangeably since the APEDA terminology depending on the HS classification uses the word Groundnuts (HS 1202). The export value of Groundnuts, (HS 1202) declined to Rs. 250.94 crores in 2001/02 (Fig. III.5) from a high of Rs. 566.3 crores in 1997/98. Peanuts comprised almost 40 per cent of “Other Processed Products” in 1993/94 and 1997/98, but accounted for only 14 percent by 2001/02 (Fig. III.5a). Though we are not analysing export destination here, the European Commission’s notified standard for aflatoxin first in 1997 and the subsequent relaxed revision in 1998 July on a global outcry by exporting countries needs to be reckoned with while looking at these two Figures. That perhaps explains how and why of sharp fluctuations discernible in Fig.II.5. For illustration, the value of exports declined from a high of Rs.566.3 crores in 1997-98 to Rs.139.66 crores in 1998-99 that is closer to the 1994-95 level of groundnut exports from India. In fact, the final export value in 2001-02 (Rs.250.94 crores) is around the value realized during 1995-96, a period when strict standards were not the major concern in trade. Be that as it may, the relative position of groundnut in the category “Other Processed Products” has sharply declined to 14.1 per cent in 2001-02.

Stringent SPS measures affecting this product line are claimed to be one of the main factors responsible for this sharp decline and a comparison of Fig. II.2 and Fig. III.5 lends support to this view. In this case study, we attempt to examine this issue in greater depth.

Source: APEDA.



Indian peanut exporters express the view that non-tariff barriers are placed on their exports in foreign markets to protect high cost domestic agricultural producers. They also face situations where they are compelled to make distress sales when foreign buyers are unable to accept their products because of non-compliance with some standards in the importer's market. Hence they feel that Indian exporters may have to depend primarily on their domestic market and, perhaps, to some extent, the SAARC region. The export data for 2001-02, in fact, reveal that about 75 per cent of the total groundnuts (HS 1202) export value were realized from three destination markets



in Indonesia, Malaysia and the Philippines.

Source: APEDA

Some problems faced by these exporters appear to be genuine. For example, different testing procedures and conformity assessment standards are required in different markets. Though each test costs Rs.6000, no one has communicated to the exporters why most of these tests are needed. Further, EU requires these tests only for imports from Egypt and India, while imports from

countries such as the USA and Argentina are exempted from such tests. Another problem is that while there is no import duty on 50-kg bags, there is a duty on 5-kg bags, as the foreign markets want to discourage retail consignments. Exporters also face problems regarding genetically modified peanuts (GMOs). Some years ago, a particular foreign market encouraged the use of GMOs; however, another market has now asked for an assurance that peanuts supplied are free of GMOs.

The issue of aflatoxin presence in peanuts appears to be a major threat to peanut exports.³² The EU Commission in Brussels has specified tolerance limits for aflatoxin contamination in peanuts along with the appropriate 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 3-test Dutch code methodology from a randomly drawn 30 kgs sample. The new procedure is much more rigorous than that currently in force, as if any of the 3 tests indicates that limits are exceeded, the lot will be rejected.

These limits are not warranted on scientific grounds (as pointed out in submissions made by various agencies and governments to the SPS committee of WTO). Laboratory tests with small animals (such as touts and rats) which were fed highly contaminated feed (B1) on a daily basis indicated that aflatoxin could cause cancer of the liver. But there is, as yet, no clear evidence that that aflatoxins are carcinogenic in humans. Even in major producer countries like Argentina, China, India, South Africa, U.S.A., Vietnam, etc. where peanut consumption is very high, particularly among the middle and lower income groups, there have been no findings or reports that aflatoxin in peanuts has increased cases of liver cancer. And peanuts are consumed in a very big way by all strata of society, especially the middle and lower class.

Further, even if a shipment of peanuts is found to contain aflatoxin, this does not mean that all peanuts are contaminated since aflatoxin is concentrated in a small number of 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 per cent of the lots rejected under the

proposed procedure would have aflatoxin levels below the established tolerance limit, i.e. they would be basically uncontaminated material.

According to a Joint Expert Committee on Food Additives (JECFA) report, aflatoxin contamination of foodstuffs is very low among EU nations, and only a few people suffer from hepatitis B. At an estimated risk at 20 ppb, there will be only 0.0041 cancer cases per 100,000 annually. Placing the risk at 10ppb, there will be only 0.0039 cancer cases per 100,000 annually. Hence the change of the standard from 20 ppb to 10 ppb would only reduce estimated cancer risk by approximately 2 cancer cases annually per 1 billion people. Thus, it seems improbable that there is any measurable risk differential between the two standards (20 and 10ppb) in populations with a low hepatitis B incidence (like in the EU countries).

The JECFA had previously recommended that maximum permissible aflatoxin levels should be fixed as low as possible. But now, on the basis of further available data, it has modified its recommendation to a reduction in 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 incidence of aflatoxin contamination, which are no longer applicable. This should be taken into account when specifying the future EU tolerance limits. It should be noted here that the Codex Alimentarius Commission had proposed a maximum limit of 15 ppb.

The implementation of the EU Commission's proposals would endanger the export of Indian peanuts to 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 to potential exporters to EU countries and impose huge compliance costs. Producers within the EU itself would also suffer unreasonably from these regulations. Whereas the WHO is proposing a limit of 15 ppb for all aflatoxin, the EU Commission continues to insist on an upper limit of 10 ppb for the raw nuts, despite the fact that the aflatoxin content decreases during subsequent processing.

Box 4: Sampling Procedure: Peanuts

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 peanuts (peanuts).

The question is how large should the sample 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.

But 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 3 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, which are binding for all EU member states, are also necessary for these products.

The European Snack Association's Nut Working Group has already expressed the industry's concern over 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 as a result of the multi-sample system. The UK Ministry of Agriculture (MAFF) (UK is the largest consumer of peanuts in Europe,– and accounts for approximately 25 per cent of the peanuts imported into Europe) has already stated that the proposals imposed a higher burden 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 noteworthy that this EU proposal possibly contravenes the

GATT/WTO agreement, as it will erect artificial barriers and seriously discriminate against a number of producing countries, particularly those in the Third World and developing countries, including India.

Box 5: Testing Plan Comparison - Cost Implications For Peanuts

Current Single Testing Procedure	Proposed EU Multi-Testing Procedure
Average MT cost: \$800	Average MT cost: \$800
Cost of testing : \$50/lot (Lot = 20 tonnes)	Cost of testing : \$200/lot (Lot = 20 tonnes)
	Rejection: 30 per cent (Based on experience of USA and Argentine testing under the Dutch Code of Practice)
<u>Final Cost US \$ 802/MT</u>	<u>Final Cost US \$ 1157/MT</u>
Source: Kaushik and Saqib (2001), p.39.	

Finally, we may note that none of the European countries is a producer of peanuts. In this context, the imposition of such stringent import restrictions on a commodity for which the EU depends entirely on foreign suppliers, ignoring the opinions of suppliers, other experts and JECFA/WTO, is not only unhealthy but may prove to be very troublesome while serving no useful purpose.

All this suggests that the proposed legislation will be counter-productive, hurting both the buyer and the seller, apart from creating numerous problems and bottlenecks for no reasonable cause. In other words, the risk posed by non-compliance is not commensurate with the costs.³³

III.4 *Mango Pulp*

The mango pulp case, contrasts with the peanut case, and is illustrative in many ways. Mango pulp as an export line is a constituent of the “Processed Fruits and Vegetables” category examined in Sections II.2 & 3 above. The value of mango pulp exports increased from a low of Rs. 26.75 crores in 1991 to a high of Rs. 263.85 crores in 2000/01, but declined to Rs. 241.24 crores in the following (2001-02) year (Fig. III.6). There are only nine major exporters of mango

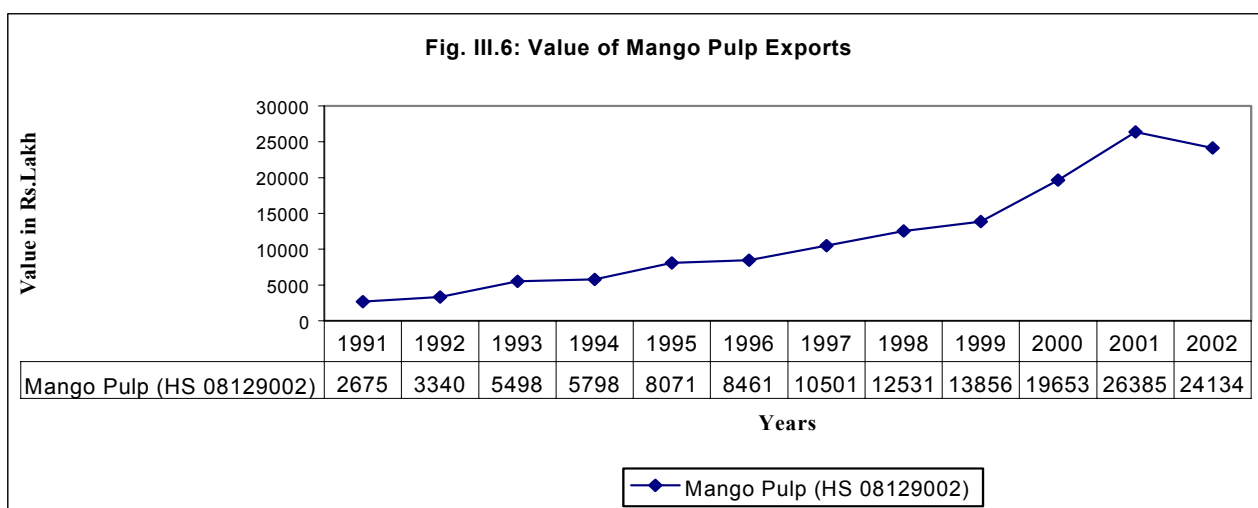
pulp in the country. Sourcing is done primarily from the Chittoor District of Andhra Pradesh and Krishnagiri District of Tamil Nadu in South India.

APEDA has taken important export promotion measures for Mango pulp. APEDA implemented HACCP with partial financial assistance from the Ministry of Food Processing Industries. During 1997-98, 12 processing units in Chittoor District were taken up. Subsequently, 12 units in the Krishnagiri District of Tamil Nadu have been taken up, with an investment of about Rs.3.5 million.

The compliance costs for implementing HACCP would have been prohibitive for the exporting firms, had APEDA not come to their rescue with both financial and technical assistance. All the participating units in the Chittoor District have implemented HACCP. Five units were assessed and certified by International Standards Certification (ISC) South Asia Pvt. Ltd. during the 1998 mango season. Six units of Chittoor District and 6 units of Krishnagiri District were assessed during the 1999 mango season. The National Sanitation Foundation (NSF) has recommended all the participating units of Chittoor District for certification after the certification audit. In the case of units in Krishnagiri District, Quality Assurance Service (Australia) has carried out certification audits of 6 and all of these have been recommended for certification.

However, small units have not been able to benefit from APEDA's efforts as problems in applying HACCP at the farm level occur given 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 some general awareness about HACCP, but they think it has not yet been passed as a law, and they do not have to worry about it yet, especially because there is no consumer insistence in India for such standards. While they admit that HACCP will certainly increase market accessibility, they believe they will face several problems in adopting it. Some of the problems pointed out were:

- (a) Since orchards land holdings are small and contractors procure the raw material, 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 establish control;
- (b) Since this industry is seasonal (3 months) it is not feasible to adopt these standards, and to retrain staff, as the units cannot keep permanent staff. Training new staff every year is also too costly;
- (c) It will be more viable for large plants or industrial houses, which 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;



Source: APEDA

- (d) As far as the financial aspect of HACCP compliance is concerned, units that are setting up now will not have any serious problems. It does not cost much for new units to be compliant, but the old units have to revamp their infrastructure. It is a costly affair; according to rough estimates, HACCP compliance will raise costs by 40 per cent;
- (e) Financial institutions do not fund HACCP activities;
- (f) Main markets for Mango Pulp are Gulf countries, and they are only interested in cheaper prices not HACCP; and,
- (g) It is quite costly to get ISO certification. The cost may range between 1.5-2.5 lakhs for ISO audit. The surveillance audit is every six-months and it costs Rs. 10,000 per man-day.

Apart from HACCP, pesticide residue affects Mango Pulp industry in the same way that it affects peanuts. Other quality issues are, that Indian pulp is brown in colour, is supplied in punctured bags, drums in which it is exported are of poor quality, experience feathering (peeling of the coat), rusting, metallic taste (tin taste) and damage to seam of the tin or drum. These are essentially packaging issues. The packaging problem identified above arises from the low quality of packaging material available in the domestic market. While imported tin is of good quality, it is more costly. According to exporters, they either do not have the technology, or the technology is too costly and they do not have the economies of scale to meet these 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 these are spread all over the country and their charges are quite high. The Central Food Technological Research Institute (CFTRI) charges Rs.3000/- per test and Societe Generale De Surveillance (SGS) charges 0.27 per cent of f.o.b. value of the consignment. Most laboratories in India do not have the sophisticated equipment required to carry out the increasingly more complicated tests necessary to comply with HACCP. For example, foreign health authorities are moving from testing for parts per million (ppm) to parts per billion (ppb). Indian laboratories are not equipped to do these tests. There are differences between the test results of India and those of Europe, allegedly due to the methods of testing, and not due to different test objectives. In Europe only 'natural food' imports are encouraged, i.e. no sugar should be added, though sugar is also a natural product. If sugar is added, import duty increases by 13 per cent (i.e., from 6.5 per cent without sugar to 19.5 per cent with sugar). However, they do add sugar themselves in Europe, using their beet sugar surpluses (generated by farm subsidies in Europe). The buyers are interested to buy the pulp with sugar, but are dissuaded by the higher duty levied. All the former colonies of France, Portugal and Spain do not pay duty on food items into EU, but all the former colonies of UK have to pay duty.

Successful exporters feel that the quality of Indian food has to be monitored for exports, and APEDA should introduce licensing. But it is very difficult to monitor implementation of norms if everybody is allowed to export and they argue that small scale units should not be encouraged to export because of their fly-by-night operations. The FPO has issued 4700 licenses for food

processing units, of which 21 are large units, 156 medium and the rest are small scale; 90 per cent of these units produce mango pulp.

Exporters often have good long term relations developed and established over many years with certain buyers. In the event of any trouble with the authorities on account of quality or any other reason, most such buyers are helpful in sorting out the problems at their end, due to their stake in the clearance of consignments. The quality issue becomes a major hurdle when the buyers have excess stock or when the international market prices of the goods have fallen below the agreed/contracted prices. In such cases, sometimes the exporters have to accept price discounts, especially when goods are perishable.

There are several issues with government agencies. The Ministry of Commerce takes an interest in the exporters operations, as they are responsible for trade promotion. But if the problems faced by the exporters are quality or health related, it is the Health Ministry that should be involved. Even in business negotiations, foreigners want an assurance from the Health Ministry, which is not easy to obtain. There is clearly a need to create better policy coherence here. The Health Ministry is responsible for the development of Codex standards. The exporters feel that the Ministry could benefit from consultations with producers when attending Codex meetings and formulating domestic standards. Food laws lay an emphasis on economic offences and not on safety; hence the basic thrust of food laws is misplaced as far as export promotion is concerned.

On a positive note, the study clearly indicates the positive impact of pro-active measures by an apex export agency like APEEDA in enhancing quality export earnings.

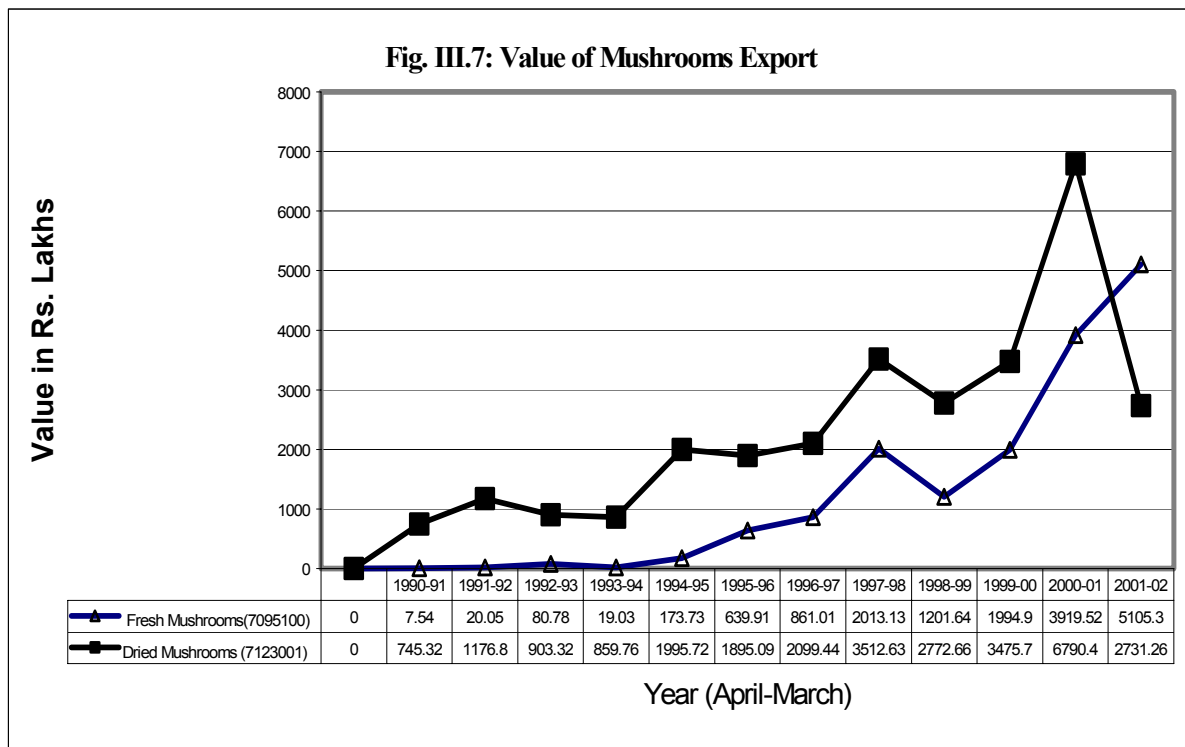
III.5 *Mushrooms*

Trade in Mushrooms has gained importance in recent years for two main reasons, namely; (i) the global shift towards vegetarian food, and (ii) Mushrooms are a rich source of protein and other nutrients that lends itself to industrial applications. A third dimension could be added in the Indian context, given its rich bio-diversity, and this may be more generally applicable for developing countries that share this attribute. Mushroom production has strong backward

linkages in terms of employment generation, without competing for scarce arable land resource. In fact, mushroom cultivation offers an opportunity to add value add to some coarse and inedible biological resources, with a little help from science.

India has been exporting both fresh and dried Mushrooms on a small scale for several years, but recently exports have expanded. Fresh Mushroom exports increased from 790 kgs. In 1990'91 to 11.8 million kg. in 2001/02. During the same period, dried Mushrooms exports reached 0.242 million kg. During 1990/91-2001/02, fresh Mushrooms recorded a growth rate – in value terms - of 3.43 per cent , while dried Mushrooms grew at 3.11 per cent (Fig. III.7). USA was the major (97.3%) importer of fresh Mushrooms in 2001/02. The main destinations for dried Mushrooms during 2001/02 were, USA (54%), Germany (19.1%), Switzerland (16.7%) and France (4.6%), with Canada, Denmark, Swaziland and Belgium accounting for the remainder. The major markets for dried/processed Mushrooms from India prior to 1997/98 were USA, Israel, Denmark and Canada. An issue of interest in our case study is the possibility that the application of SPS measures may have had a significant impact on this shift in export destinations.

Source: APEDA.



Box 6: Mushrooms: A Fact File

India has shown a production capacity of about 40,000 tonnes of all types of Mushrooms during the 1998/99 period. These do not include the edible wild Mushrooms harvested from nature. The marketing of Mushrooms harvested from nature is handled by the traders/exporters in big cities who collect the Mushrooms from the growing areas through local contacts.

A majority of EOUs grow White button (*Agaricus*) Mushrooms that have a maximum demand both in the domestic as well as in the international markets.

Oyster (*Pleurotus*) Mushrooms are sold fresh or dehydrated in the local market since it is preferred by small and marginal Mushroom growers in the tropical and sub-tropical areas and is able to adapt to a wider temperature range. This type of Mushroom cultivation is least capital intensive and requires simple cultivation practices.

The third type of main Mushrooms, *Volvariella* is commonly called the tropical paddy straw Mushroom. It is generally grown in hot/humid areas of peninsular India and also in Southern Coastal areas. It has a very short shelf life and therefore is locally consumed.

There are fourteen large-scale white button Mushroom units/export oriented units (EOUs) located at different places with approximate installed production capacity of 30,600 TPA.

All the units are currently in production and some are selling fresh Mushrooms in markets in India while most of the EOU's are exporting. There are scores of other smaller units growing Mushrooms in environment - controlled cropping rooms in various parts of India. The seasonal growers also form a big chunk, produce mostly for markets around their location.

Despite the fact that the EU and USA are very large producers of mushrooms in the world, they are also the largest importers as well. The EU production of mushrooms is estimated at about 1 million tonnes and that of USA at about 375,000 tonnes equivalent to fresh form. The imports of mushrooms into USA and EU are estimated at about 84,000 tonnes and 14,300 tonnes respectively in the year of 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 which range between 12 per cent to 23 per cent for mushrooms supplied in various forms. The export into 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\$ 4.6/Kg. With that kind of duty structure outside the quota it is difficult to export mushrooms to EU. India does not enjoy at present a separate quota but it has been placed in the residual group with other countries and allocated 4.52 per cent of the total import value as against 31.25 per cent for China and 59.76 per cent for Poland.

At present, most of the small growing units are experiencing severe constraints to achieving higher productivity levels. Some of these bottlenecks, identified during our preliminary interaction with the industry, are discussed below.

Quotas on mushrooms in the EU are an uncorrected legacy 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. Multilateral efforts are required to expedite this process. Meanwhile, India needs to make representations to the EU to obtain an exclusive quota. 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 present its case to fill-up such under utilised quotas through a separate allocation.

III.5.1 Technology Gap

Mushroom growing in India started with the use of primitive technology for compost making/crop raising in the late 1960s/early 1970s, which resulted 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 6-8kg/100 kg compost was harvested in 6-8 weeks of cropping and the crop was raised in make-shift cropping rooms. This was followed by the second phase of activity, when a modern mother composting unit was established in Solan with FAO assistance. Compost was prepared here by an improved method in 2 phases, and a rich substrate was prepared from cereal straws/poultry manure. This richer compost doubled the productivity of mushrooms per unit weight of compost, which is considered a big leap for the growing mushroom industry in our country.

With the increased exposure of scientists/workers to modern growing methods, and with more and more people taking to this profession, the Mushroom industry started to mature. The establishment of the National Research Centre for Mushrooms (NCRM) by the Indian Council of Agricultural Research (ICAR) at Solan, H.P. in 1983, further provided fillip and encouragement to the industry. Government support for R&D in this sector supplemented concerted efforts for popularising improved methods of cultivation, screening of improved strains for use by seasonal growers, and addition of more varieties of Mushrooms to the list of cultivated Mushrooms in India. Information on improved technology was still not available to the average common grower

or an upcoming entrepreneur in India. Thus, though the grower produced the compost, there was a bottleneck on accessing information on raising a healthy crop of mushrooms. The grower would collect spawn from some source but not know about the growing parameters, nor was the modern cropping room available to him. So, the majority of the growers continued to use this method of growing in improvised cropping rooms till the late 1980s, resulting in poor yields.

In the late 1980s and early 1990s, modern cultivation units were established with help from various companies in Europe, which were more interested in selling their machinery and in the establishment of the mushroom farms at their asking rate. This did help in the building of modern mushroom units, but the big question was who would manage and run them. That is where the Indian industry took a beating, and unit after unit failed to produce mushrooms on a profitable scale. Producers took some time to tune the production parameters until most units could obtain economic yields. But, by the time this was achieved, the international market came crashing down. This situation is still continuing.

III.5.2 Role of Government Institutions

The available R&D support caters more to the information and training needs of the small/marginal Mushroom growers. The average yield per unit weight of compost has been increased to 16-20 kg/100 kg compost in 6 weeks of cropping. But to become globally competitive, the aim is to achieve yield increases combined with reductions in cultivation costs.

III.5.3 Exploitation by the Foreign Machinery Sellers and So-called Consultants

The foreign machinery sellers painted a rosy picture of the market. They applied the technology and machines, used in labour starved countries of Europe, on an 'as-is-where-is' basis, and the results were not very encouraging. The machinery sellers from industrialised nations, besides selling machinery, also offered technical know-how for the cultivation of the white button Mushroom in cropping rooms with a computer-controlled environment. They failed to understand that the conditions in temperate Europe and in tropical India are fundamentally different. While the temperature needs to be raised under European growing conditions, the

Indian requirement is the opposite. The task becomes even more complicated when not only temperature, but also other parameters, like R&D, air speed, heat removal, CO₂/O₂ content of the cropping room need to be manipulated. All such parameters must be maintained at specified levels during various stages of crop raising; as change in a given parameter affects the others. Further, most of the raw materials used in Europe are not available in India. For instance, peat for casing is not available in India and alternative materials have to be used in its place. The European grower is used to heavily watering the peat casing, which is not relevant for Indian conditions. Post-harvest handling of fresh Mushroom in temperate areas is easier as compared to warmer climates where there is a premium on quick post-harvest handling.

The foreign machinery sellers offered buy-back arrangements to most of the projects (export-oriented units), but in-fact the end result was a fiasco. This was a false guarantee given to naive entrepreneurs to induce them to participate in the project, a fact which the entrepreneurs realised too late. It became fashionable for financiers in India to ask for a buy-back guarantee from a foreign buyer, which in the opinion of the buyers was nothing but a ploy to safeguard the interests of the financiers. What would have been genuinely useful would have been measures to ensure that every project entrepreneur obtained a clear picture of the national and international marketing system and the market place. Every project entrepreneur should undertake a market survey on a realistic basis, and provide his assessment and projections of the market. Of course export markets are not the only outlets for Mushrooms; India itself will be a big market for Mushroom growers in the future, especially for fresh marketing of the produce.

III.5.4 Raw Materials Available in India and Lack of Information on its Optimal Utilisation

The raw materials available for mushroom cultivation vary in different parts of India. In most of the northern and central parts of India, wheat straw is widely available but at high prices. 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 widely grown (western parts of India, central India, and some other places). The requirements and techniques for composting differ with different base materials (wheat straw, paddy straw/ or sugarcane bagasse) and information available to growers on the use of paddy straw/ or sugarcane bagasse as a base material is limited. Optimal utilisation of the above

materials for composting to obtain economic returns requires specialised skills from the manager/entrepreneur. Casing is the second important input in button Mushroom growing. Because not many casing materials are available for commercial growing in India, the choice has narrowed down to Farm Yard Manure (FYM)/spent compost/composted coir pith, etc. These materials require to be processed (water leached/steam pasteurised) before use, unlike the peat sold in Europe that is harvested from underground bogs deep down. This material is devoid of harmful micro-organisms and is used after adjustment of pH with lime. Use of the above agro-wastes as casing in button Mushroom cultivation, in place of peat, again requires experience on the part of the grower for their optimal utilisation..

Though NRCM has generated information on composting/casing material usage, and Mushroom productivity from these materials on a commercial scale, the price factor is indeed critical.

III.5.5 Absence of Organised Support to Mushroom Industry, for Processing and International Marketing

There is no organised assistance available for marketing of this produce in India. Every export oriented unit has its own individual arrangement for marketing, and the Mushrooms are preserved in brine and canned in large containers of 3-5 litres (or bigger) capacity for export. Government support for Mushroom marketing is not available in India, nor is any special/preferential quota available in the European Union (as is available to certain other nations). Direct export to USA/Germany under some sort of arrangement is one alternative that could be considered. For this, growers will have to form a marketing co-operative. There are no processing plants devoted to providing support for this industry in India, except for some limited support by NAFED to seasonal growers in the north-western plains of India. Such support is available to Mushroom growers in China, where they are able to can the produce on a large scale at rail-accessible points for export. Finance at lower interest rate, and inputs for infrastructure at fair prices, should also help this industry to keep down the cost of cultivation. Lower production cost, together with greater productivity per unit weight of compost, can help the industry to become globally competitive. A long-term strategy has to be developed to help the industry. This could include manpower training, development of high yielding strains, a better pest

management programme, and efficient post harvest handling/processing systems for value addition.

Clearly, in the case of Mushrooms, India currently faces unfriendly tariff structures and quota issues in world markets on the one hand, and capacity and technology issues on the other hand. These, rather than environmental issues, are the major constraints to the development of the industry.

IV. Conclusion

This exploration into the application of the SPS regime in the processed food products in India was focussed on five processed product lines, each from a different segment of the wide spectrum of available products. It was observed that all selected processed food products were assisted by the policy liberalisation regime of the early 1990s. But, in the post-WTO period, particularly since 1996/97, the complexity of the SPS regime seems to have significantly constrained market access in developed countries for Indian processed food products.

The poultry product (e.g., egg powder) and marine (Shrimps) product exports to EU and USA reveal contrasting scenarios. Egg powder plants in India that were dedicated to produce exports to the EU markets closed down because of the imposition of stricter food safety standards. On the other hand, the EU approved plants for processing marine products, many exporters could not understand or cope with the shifting safety standards, and they explored alternative markets. As a result, the realized unit value of these exports declined.

The hiatus between scientific merit and trade economics is further brought home, when the application of SPS measures to Peanuts/Groundnuts, Mango Pulp and Mushrooms export lines are examined. The case studies confirm the untenability of higher and stricter food safety standards in EU and USA, given emerging trends in dietary preferences and living standards. Although India has a competitive edge in production, market outcomes appear to have been dominated by the impact of SPS as a major non-tariff barrier. This development bodes ill for the successful continuation of multilateral trade arrangements visualised in the WTO agreement.

We have repeatedly seen in all five case studies that SPS norms are used by manufacturers of the processing industry machinery in the developed countries to process food exports from the developing countries. The ingenuity, if any, of the importing nation in crafting non-tariff measures to thwart greater access to processed food exports from the developing countries has become more explicit and transparent. Detention of food consignments on grounds like “unapproved”, “not listed”, does not demonstrate the maturity of the dominant developed country trading partners. (It was shown that a large number of Indian poultry consignments got

rejected due to the following specification targets: (i) Filthy, (ii) Salmonella, (iii) Not-listed, (iv) Unapproved and (v) Insanitary.) Similarly, actions like the insistence on the use of the Turtle Extruder Device (TED), a particular sampling techniques for Aflatoxin testing, and the practice of frequently changing sensitivity levels for testing results, and the resort to emergency notification clauses are indeed trade distorting.

To conclude, the case studies highlight the crucial issues of maintaining quality norms, from a developing country perspective, and attempt to link issues of SPS barriers and broader economic issues related to international trade.

Our preliminary investigation reveals that SPS affects India's (and possibly other developing countries') exports differently than is generally believed. Besides, the push for use of highly capital intensive technologies to gain compliance with SPS regulations leads them to becoming, in practice, non-tariff barriers for the developing countries exports. Though the developed countries present a picture of genuine concern for the welfare of developing countries through different arrangements and programmes like preferential market access through the Lome Convention, the preliminary investigations undertaken in these case studies show a contrasting picture.

In the final analysis, processed food exports must become a viable instrument to sustain and enhance social welfare in developing countries through poverty alleviation. This is possible if all trading partners work towards making the trinity of science, safety and trade of food products blend to form a harmonious unity.