SPS Barriers to India's Agriculture Export

Learning from the EU Experiences in SPS and Food Safety Standards

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List of Abbreviations

Agricultural and Processed Food Products Export Development Authority	APEDA
Agricultural Produce Market Committee	APMC
All India Rice Exporters Association	AIREA
Association of Public Analysts	APA
Bacterial blight	BB
British Retail Consortium	BRC
Broad-based Trade and Investment Agreement	BTIA
Bureau of Indian Standards	BIS
Capacity-building Initiative for Trade Development	CITD
chlormequat chloride	ccc
codex maximum residue level	CXL
Deoxyribonucleic acid	DNA
Department for Environment, Food and Rural Affairs	DEFRA
Directorate General of Foreign Trade	DGFT
Directorate General of Health and Food Safety	DG SANTE
eggplant fruit and shoot borers	EFSB
European Commission	EC
European Food safety Authority	EFSA
European Union	EU
European Union Notification System for Plant Health Interceptions	EUROPHYT
Export Inspection Agencies	EIAs
Export Inspection Council of India	EIC
The Food and Agriculture Organization of the United Nations	FAO
Food and Veterinary Office	FVO
food business operator	FBO
Food Safety and Standards Authority of India	FSSAI
foot and mouth disease	FMD
foreign direct investment	FDI

free on board	f.o.b.
free trade agreement	FTA
General Agreement on Tariff and Trade	GATT
General Principles of Food Hygiene	GPH
Generalized System of Preferences	GSP
geographical indication	GI
Good Agricultural Practices	GAP
Great British Pound	GBP
Gujarat Co-operative Milk Marketing Federation Limited	GCMMF
Hazard Analysis and Critical Control Point	HACCP
Harmonised System	HS
high temperature short time	HTST
Importer Exporter Code	IEC
In Process Quality Control	IPQC
Indian rupee	INR
Indian Oilseeds and Produce Export Promotion Council	IOPEPC
Information Network for Animal Productivity & Health	INAPH
International Food Policy Research Institute	IFPRI
International Organisation for Standardization	ISO
International Union for the Protection of New Varieties of Plants	UPOV
Jawaharlal Nehru Port	JNP
Kentucky Fried Chicken	KFC
Local Authorities Coordinators of Regulatory Services	LACORS
Maharashtra Hybrid Seeds Company	MAHYCO
Maharashtra State Agricultural Marketing Board	MSAMB
maximum residue limit	MRL
metric tons	MT
mutual recognition agreement	MRA
National Dairy Development Board	NDDB

non-resident Indian	NRI
Office International des Epizooties (World Organisation for Animal Health)	OIE
parts per billion	ppb
parts per million	ppm
Plant Protection and Quarantine	PPQ
Quick Service Restaurant	QSR
Rapid Alert System for Food and Feed	RASFF
Registration-Cum-Allocation Certificate	RCAC
research and development	R&D
Rice Exporters Association of Pakistan	REAP
sanitary and phytosanitary	SPS
skimmed milk powder	SMP
specific trade concern	STC
ultra high temperature	UHT
United Arab Emirates	UAE
United Kingdom	UK
United States	US
United States Dollar	USD
Vegetables and Fruit Exporters Association	VAFA
whole milk powder	WMP
wood packaging material	WPM
World Health Organization	WHO
World Trade Organization	WTO

Executive Summary

India is one of the largest producers of a number of agriculture commodities and the European Union (EU) is one of the largest export markets for India. In 2015-16, India's export of agricultural commodities to the EU was more than five times higher than the EU's exports to India. While the EU continues to be a key export destination for Indian agricultural exports, in recent years a number of Indian agricultural products have been facing rejection and export bans in the EU due to standards related to food quality, safety and health, also known as sanitary and phytosanitary (SPS) measures. The European Commission (EC) funded EU-India Capacity-Building Initiative for Trade and Development (CITD) project, which was launched in the year 2013, provides a platform to build the capacity of various Indian stakeholders on how to address different trade related issues, including the SPS issues. Under this project, the ***objective of this report is to study SPS related barriers faced by India's agricultural exports to key markets, identify the reasons for such barriers and make recommendations on addressing barriers through greater collaboration and knowledge sharing with the EU.***

1.1 Methodology

The study is based on secondary data analysis and a primary survey using the case study based approach for nine agricultural commodities, namely, mangoes, table grapes, Basmati rice, dairy products, green peas, green beans, eggplant, peanuts and mushrooms.[1] The stakeholders were identified in consultation with Agricultural and Processed Food Products Export Development Authority (APEDA), sector specific export promotion councils, state government departments and industry associations. The survey was conducted from May 2016 to March 2017.

1.2 Key Findings

The survey found that there are differences in the case studies with respect to the extent that different products are affected by the EU's SPS measures. There are products (such as mangoes, grapes and eggplants) in which Indian exporters have faced rejections or bans in the EU and other markets in the past for SPS issues such as fruit flies or thrips infestation. These issues have now been resolved by implementing measures (such as hot water treatment for the mangoes being exported to the EU or gamma irradiation treatment for the mangoes being exported to the US) that are acceptable to the importing countries. For some products, there are issues with the maximum residue limits (MRLs) permissible for certain chemicals and pesticides as is required by the EU, which can act as SPS barriers for Indian exporters and farmers. For some products such as green peas, green beans and mushrooms, there are hardly any SPS related alerts raised by the EU, but export potential is low.

The survey also found that implementing traceability to the farm has been the most successful way of addressing the SPS barriers on a long-term basis. Setting up systems to allow for traceability (as part of domestic reforms) and requests for scientific justifications for new or adjusted SPS measures of India's trading partners (through trade agreements) have helped India

[1] This methodology and the selection of products was requested in the Terms of Reference (ToR) for this study.

to raise certain SPS issues in the World Trade Organization (WTO)'s Committee on Sanitary and Phytosanitary Measures. These have been discussed in detail in the respective chapters.

1.2.1 SPS Barriers in the EU: Where They Arise and Their Impact

This report highlights that the EU has higher food safety standards than not only those set by international organisations such as Codex Alimentarius Commission, but for some products such as peanuts, the standards are higher than those set by other developed countries such as the US. There are instances where the EU has frequently revised the MRL for chemicals for various products, which make the imports to the EU more prone to rejections. It is extremely difficult to understand the scientific justification for some of the changes in the MRL, such as the proposed reduction in the chlormequat chloride (ccc) limits in grapes from 0.05mg/kg to 0.01mg/kg in the year 2016 and India has argued this case in the WTO. The EU has decided to roll back the measure until there are scientific justifications. In a number of cases, such as the reduction of MRL of ccc for grapes and MRL of tricyclazole for Basmati rice, the issue has to be addressed at field level by reducing/limiting use of the particular chemical, but this would require longer transition periods as such adjustments are not possible within a short time duration.

For certain products like milk products, the export requirements related to health and food safety standards are so stringent that there are hardly any exports. Further, in cases where India has official export inspections, laboratory testing procedures/residue monitoring procedures; the EU in its audits has raised concerns related to such procedures. Recently, the EU decided to test up to 50 per cent of India's shrimp consignments for residues such as chloramphenicol and nitrofurans, which was earlier 10 per cent.

Over the years, India has set up a robust export inspection regime. However, the survey participants fail to understand why after meeting all the official export inspection requirements in India, their consignments are being rejected in the EU.

The case studies also highlight that the certain chemicals, pesticides, etc., used in farms can lead to SPS barriers and, therefore, they can only be controlled to some extent at the post-harvest and pre-export stage. The survey found that the product can also get contaminated in the supply chain due to poor storage conditions or incorrect processing technologies, among others. Specifically, aflatoxin contamination in Basmati rice and peanuts has been attributed to poor supply chain and storage conditions by a number of studies and this may be a possible reason for SPS barriers and product rejections.

The case studies also discussed how these barriers have adversely affected the Indian exporters and farmers. It ranges from loss of revenue and reduction in shelf-life of products, to destroying the products/consignment at the EU port of entry. Since issues are product specific, each case study discusses how the specific issues have adversely affected the different stakeholders.

The case studies show that the EU standards apply equally to the EU food business operators (FBOs) as well as to all exporters to the EU. In this context, it is important to note that public

awareness and concerns about food safety are rising across the world. There has been an increase in the use of risk analysis techniques and a number of developing countries are taking measures to implement more stringent food safety standards for both exports and domestic consumption. For example, Cambodia banned tricyclazole in March 2017, following the EU's new MRL on the same.

One of the concerns of the Indian exporters is that they are losing their market share to exports from countries such as Kenya, Uganda and Brazil and Chile, who are able to meet the EU standards. Therefore, SPS issues have to be addressed in the context of a highly globalised and competitive trade environment.

1.2.2 Addressing the SPS Barriers

The SPS barriers can be addressed in several ways such as by ensuring conformity to the importing country standards, implementing certain processes to meet the importing country requirements, undertaking corrective measures, implementing good agriculture practices, raising the issue in the WTO and discussing the issue bilaterally with the importing country, among others. These are discussed in details below:

- ***Implement Product Traceability:*** The most successful way of resolving the SPS issues in the recent years has been establishment of product traceability. The case studies of mangoes, fresh grapes, peanuts and eggplant reflect how product traceability can help to overcome the SPS barriers. A number of exporters and processors are also keen to have a product traceability system for Basmati rice and milk products, which is presently not in place.

  There are some issues in implementing product traceability, which may continue to exist. India is a large country with multiple small and mid-sized farmers and, therefore, raw materials are procured from multiple farms and agriculture *mandis*, which make it difficult to ensure product traceability. The same is true for sourcing of milk from co-operatives. Further, direct sourcing and contract farming are not allowed in certain states which makes it difficult to have direct links between exporters, processors and farmers, and ensure product traceability.

- ***Initiate Proactive Measures:*** The case studies show that proactive measures will enable India to counter bans. For example, while mangoes from Pakistan faced significantly more interceptions than Indian mangoes for fruit flies during the same time period, Indian mangoes faced the ban and Pakistani mangoes were not banned. This is because when the EC sent a warning letter to Pakistan, it immediately stopped exporting mangoes and made hot water treatment mandatory. Similar action was taken by India for okra which helped the country to counter a ban.

- ***Implement Good Agriculture Practices (GAP):*** Most developing countries address the SPS issues faced in developed country markets by implementing GAP and reducing the use of chemicals and pesticides. The survey found that many chemicals that are globally banned

are still available over the counter in India. If Indian farmers use these pesticides, they will not be able to exports to countries such as the US, the EU and Japan.

A number of state government officials pointed out that India should move to safe agriculture and GAP. First, chemicals and fertilisers that are banned in other countries should not be used in India. Second, the curriculum in agricultural universities should be updated and students should be imparted with lessons on modern and good agriculture practices that can be applied at the ground level. These have to percolate down to the farm level. Agricultural universities can have farm-level programmes to enable the practical application of knowledge. Third, in sectors such as dairy sector, proper hygiene conditions should be maintained at the farm level to ensure that the milk that reaches co-operatives and private processors is of good quality. Indian government has renewed its focus on hygienic milk production and marketing and such efforts have to begin at the farm level.

Farmers who were surveyed, irrespective of their farm size, revealed that they would like to move away from the use of chemicals and towards GAP and subsequently towards organic farming as there is greater demand for organic products in large markets such as the EU. All government departments may work together to design a comprehensive policy on safe agriculture and organic farming.

- ***Strengthen Testing Procedures and Follow Global Best Practices:*** In the case of sectors such as milk products and milk-based products, efforts have been put in the right direction to ensure that India has good inspection process for dairy exports. There is a need for research in developing efficient testing procedures for milk products and milk-based products. General Principles of Food Hygiene (GPH) based on the hazard analysis and critical control points (HACCP) system for milk production and processing should be followed throughout the milk supply chain.

- ***Export Infrastructure:*** The survey found that India has been increasingly implementing food safety assurance and management system such as HACCP, and the Food Safety and Standards Authority of India (FSSAI) is also enforcing it for all FBOs. However, some trading partners such as the EU are insisting on installation of specific infrastructure requirements such as mechanised methods of milking, which may be possible for private dairies to abide by but may be difficult for the milk co-operatives to implement, given the large number of small farms. In this context, it is important to identify and prioritise companies which are ready to export and those which need further training and capacity building and infrastructure prior to export. The survey recommended creation of model dairy farms with common infrastructure such as mechanised milking facilities for the small farmers and co-operatives. This will also enable poor farmers to have access to state-of-the-art infrastructure and hygienic methods, which will in turn enable them to earn better revenue.

  Discussions at the WTO's Committee on Sanitary and Phytosanitary Measures highlight that India is of the view that aflatoxin contamination can happen in transit (for example, during storage and transportation), while according to the EU it is possible to restrict aflatoxin contamination through appropriate packaging, storage and shipping conditions. While the two economies may differ in their views, there is no denial that it is important to

strengthen the supply chain. In this context, the Ministry of Agriculture & Farmers Welfare and the Ministry of Food Processing Industries (MOFPI), and others agencies such as the National Centre for Cold Chain Development (NCCD) which are involved in building agriculture infrastructures pay a key role.

The survey strongly recommends that there should be products of exportable quality accompanied by farm level infrastructure and supply chain that support the exports. This along with a product traceability system (which helps to ensure quality) will facilitate exports. Without these there may not be any exports – the case study of milk product exports highlight that India is the largest producer of milk and has a fairly robust export inspection regime, yet there is no exports because the produce and farm level infrastructure does not meet the importing country's requirements.

- ***Data Generation and Data Availability:*** To raise an SPS issue with any trading partner, there is need for data and scientific justification. In India, there is no data of exports from different states. This data has to be collected and analysed. APEDA, through the *TraceNet* system, can create a database consisting of exports from the state, number of farmers and acreage under export, etc., which can be made available on the public domain through the APEDA website. Since agriculture is a state subject, information on how much land is used for cultivation for export, export contribution of each state, export infrastructure in each state, etc., will be particularly beneficial for both state level policymakers and exporters. Further, in sectors such as dairy sector, India is not declared free from foot and mouth disease (FMD) by the Office International des Epizooties (OIE). However, the government is continuously making efforts to reduce the incidence of FMD outbreaks. There is a need for collection of data by the relevant authorities capturing the information on FMD outbreaks in the country. This will also help to raise the issue in the WTO and other forums, if it is backed by data and scientific evidence.
- ***Scientific Research:*** A number of agriculture products that India exports to the EU and other markets are specific to this country. For example, Basmati rice, Alphonso mango and Darjeeling tea. These are premium products and if such products get rejected or banned, the cost of such a ban is high. To prevent it, there is need for scientific research in India to find out methods to address the issues faced by such products in key markets. The research should focus on both short-term and long-term solutions and research outcomes may be made available in the public domain before implementing policies. Such research findings can be used in discussion with the importing countries and also for training and knowledge sharing with the exporters and other stakeholders.
- ***Request for Information and Scientific Justification:*** The case studies show that while information on the SPS measures imposed by the EU is available in the public domain, in some cases the scientific justification for imposing the measure is not clear. India should request for the scientific justification of the measures.
- ***Discuss the Issue in the WTO:*** Out of the 416 specific trade concerns that have been raised in the WTO by its member countries, only 8 are raised by India against the EU. Given that Indian exports face a number of SPS barriers in the EU, India can raise more concerns in the WTO, with scientific evidence and data supporting the concerns. Further, the status of

6 out of 8 concerns given as "not reported" (NR), which implies that the current status of the concerns (whether it has been addressed or not addressed) is not known. It is important to clarify the status once the issue is resolved in the WTO.

- ***Discuss the Issue Bilaterally by taking Buyers and their Associations into Confidence:*** The survey showed that SPS issues are mostly discussed bilaterally with the importing country. Such discussions may be more beneficial if the EU buyers support it and if the restrictions imposed by the EU adversely impact them. The case of tricyclazole for Basmati rice is a good example in this respect. In this case, certain relaxation of the time period of implementation of the measure has been given to Basmati rice growing countries (namely India and Pakistan) at the request of the European FBOs and other stakeholders. Thus, working with the EU buyers can help to reduce the SPS barriers.
- ***Sign Equivalence Agreements/MoUs:*** The WTO's SPS Agreement encourages member countries to recognise each other's conformity assessment systems based on international standards so that products certified in one country are accepted without the need for further inspection/testing by other countries through equivalence or mutual recognition agreements (MRAs). The Codex Alimentarius Commission also encourages such agreements with a view to avoid duplication of inspection and testing which can increase the cost of exports, and to ensure the health and safety concerns. The EU enters into product specific MRAs and such agreements are possible with countries that have strong export control system. India may sign product specific equivalence agreement with the EC. The content of the agreement may include, among others, provision for retesting and appeal in case of product rejection.
- ***Knowledge Sharing and Collaboration with the EU:*** The case studies identified specific areas where there is need for knowledge sharing and collaboration with the EU. The EU-India CITD programme has helped to establish co-operation and to increase capacity of key beneficiaries, but there are possibilities of further co-operation and capacity improvement.

To conclude, in spite of the issues that companies may face, the report found that there is strong willingness among Indian exporters, processors and farmers to meet EU standards. The case studies of mangoes and fresh grapes reflect success stories; efforts were made by the government agencies, farmers and exporters to adhere to the EU norms to be able to export to them. The EU is a crucial market for India and all stakeholders (including exporters, farmers, processors, supply chain agents) have accepted that they have to meet EU export requirements and they are willing to do so.

Chapter 1: Introduction

Global trade in agricultural products was valued at around United States Dollar (USD) 3.3 trillion in 2015.[2] According to the World Trade Organization (WTO), the value of global agricultural exports nearly tripled between 2000 and 2012, while agricultural exports increased by about 60 per cent in volume terms over the same period.[3] In the year 2015, the European Union (EU) was the largest exporter of agricultural produce and India was the ninth largest exporter. However, there are some areas of concern. First India's share in global exports of agricultural products has remained low at around one to two per cent in the last ten-year period. Second, India's position among the top ten exporters declined from 7th in 2014 to 9th in 2015 and the country recorded a decline of around 19 per cent in exports from the previous year. Third, Indian agricultural exports have been facing rejection in important markets such as the United States (US), the EU, Australia and Japan because they do not meet food safety requirements, also known as sanitary and phystosanitary (SPS) standards imposed to protect the health and safety of consumers of importing countries and regions.

A number of studies have shown that Indian exporters have been facing difficulties in exporting food products to key markets such as the EU (Chaturvedi and Nagpal, 2003; Mehta, 2005; Chaudhari *et al.*, 2012). The issues affect various products and are multi-dimensional in nature. This means that technical assistance is often required by developing countries to successfully meet global standards or the standards of specific importing countries.

Given this background, the European Commission (EC) initiated a project entitled 'Capacity-building Initiative for Trade Development' (CITD), was launched in 2013 to help to modernise and enhance the capacity of India's trade-related regulatory institutions and enforcement systems to meet international standards and requirements. 'SPS and food safety standards' is one of the key areas under this project where trade related assistance in the form of training, field visits and knowledge sharing are offered to Indian exporters, farmers and export promotion organisations to enable them to upgrade and help them adhere to EU standards. This report, which is a part of the project, **aims to examine SPS related barriers faced by India's agricultural exports to key markets, identify the reasons for such barriers and make recommendations to help address the issue of barriers through greater collaboration and knowledge sharing with the EU**. The broad objective of the study is to suggest measures to help upgrade the quality and standards of India's products with a view to increase exports; increase understanding of the EU's standards and regulations to facilitate exports to the EU market; identify the training needs of different stakeholders in the export supply chain, and identify the reforms required in India and areas of EU-India knowledge sharing and collaboration.

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2 Calculated using the World Trade Organization's Statistical Review, Table No. A14, accessible at https://www.wto.org/english/res_e/statis_e/wts2016_e/wts16_chap9_e.htm (accessed on 19 December, 2016)

3 WTO. 2014. World Trade Report 2014. Trade and development: recent trends and the role of WTO. Geneva, Switzerland

1.1 Methodology

The report is based on a literature review, secondary data analysis and case studies of specific agricultural product exports to the EU. The study covers nine products – mango, table grapes, Basmati rice, dairy products, green peas, green beans, eggplant, peanuts and mushrooms. The products were given to the research team by the Agricultural and Processed Food Products Export Development Authority (APEDA), Export Inspection Council of India (EIC) and other beneficiaries of the EU-India CITD programme. For this study, one-to-one meetings were held with central and state government officials, export promotion and regulating agencies, state chambers of commerce, state marketing boards and industry associations. The list of exporters was identified after discussion with APEDA, state marketing boards, product specific associations, etc. Care was taken to cover companies whose product has faced SPS issues in the EU market. The sample size depended on the product category. In certain products, such as grapes and mangoes there are a large number of exporters while in others such as green peas there are only a few exporters.

The secondary data has been used to present an overview of agriculture trade, and product specific exports. It is important to note that India grows a number of varieties of specific products such as mangoes but may export only certain varieties of mangoes for example Alphonso mangoes. This is discussed in the case studies. Each case study follows a common format. It begins by describing the interviews covered in the survey, Indian export to the world and the EU, the export process and the supply chain. It then focuses on SPS measures imposed by the EU that can act as a barrier to Indian exports and how it has impacted exports of that product, the exporters and other stakeholders such as farmers. It also covers wider challenges that affect compliance with the EU's SPS measures.

It is important to note that SPS issues arise on a continuous basis and only those issues which came up during the time period of the survey (the survey was conducted from May 2016 to March 2017) are presented in this report.

The issues raised by exporters were cross-verified with other stakeholders such as farmers and logistics service providers and state government departments and state marketing boards. In some cases the case studies have been substantiated by secondary information such as the EC audit reports. Product specific recommendations are given in each case study and general recommendations are given in the concluding chapter.

1.2 Layout

The layout of the report is as follows. The next chapter (Chapter 2) presents an overview of India's agricultural exports to the world and the EU. It also examines the broad changes in export patterns in the past ten years. It then examines the key institutions regulating exports in the two economies and how food safety related issues are addressed in India's and EU's trade agreements. Chapters 3 to Chapter 11 present the case studies of the selected product categories. The case studies follow a common format. They present global production and India's position in the production of the specific product, key states within India producing the

product, India's export of the product and share of the EU in exports, the export process, regulation and value chain, SPS and other barriers to export and the way forward. Chapter 12 summarises the findings from secondary literature and the survey and presents the policy recommendations from the study.

1.3 Various Ways to Address SPS Barriers

The preliminary meetings with APEDA, Trade Policy Division of the Department of Commerce, industry associations such as Federation of Indian Chambers of Commerce and Industry (FICCI) and Confederation of Indian Industry (CII) confirm that SPS issues faced by Indian exports to the EU can be addressed through the following strategies or corrective measures:

- India (either on its own or along with other exporting countries) can ask for scientific evidence of SPS measures implemented by the EU. The EC can share the scientific justification for imposition of SPS measures with India and also share what other countries are doing to address the SPS issues.
- India adopts certain measures domestically (such as implementing a traceability system) that are acceptable to the EU. The EU checks that the measures are to its satisfaction and then India continues to export.
- SPS barriers can be addressed through mutual collaborations and knowledge sharing under initiatives such as the EU-India CITD programme.
- India may initiate domestic reforms.
- As a member of the WTO, India may raise the issues under the Agreement on the Application of Sanitary and Phytosanitary measures.
- If India signs a trade agreement with the EU in the future, SPS issues can be discussed under that agreement.

The case studies examine in detail what measures have been adopted and what strategy India can adopt in the future. As a first step it is important to note how SPS issues are discussed under the WTO's SPS Agreement and what the implications are for the EU and India.

1.4 WTO's SPS Agreement: Can India Raise SPS Issues in Exports to the EU under this Agreement?

The **Agreement on the Application of Sanitary and Phytosanitary Measures** (known as the "SPS Agreement") entered into force with the establishment of the WTO on 1 January, 1995. The Agreement sets out the basic rules for food safety and animal and plant health standards. It allows countries to set their own standards but also mentions that regulations must be based on scientific analysis. Regulations should be applied only to the extent necessary to protect human, animal or plant life or health and they should not arbitrarily or unjustifiably discriminate between countries where identical or similar conditions prevail.

According to the WTO, domestic policies related to food quality, health and food safety are among the most common non-tariff barriers. The SPS measures are imposed by most countries to

'limit the damage caused by or to protect the health of individuals from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms, additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs; diseases carried by animals, plants or products.'[4]

Under the WTO's SPS Agreement, SPS measures are defined as any measure applied to protect animal or plant life or health from risks arising from:

- the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms;
- additives, contaminants, toxins or disease-causing organisms in food, beverages or feedstuff;
- diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests.

SPS measures include all relevant laws, decrees, regulations, requirements and procedures including, *inter alia*, end product criteria; processes and production methods; testing, inspection, certification and approval procedures; quarantine treatments including relevant requirements associated with the transport of animals or plants, or with the materials necessary for their survival during transport; provisions on relevant statistical methods, sampling procedures and methods of risk assessment; and packaging and labelling requirements directly related to food safety. The SPS Agreement also encompasses measures to prevent or limit other damage within the territory of a country from the entry, establishment or spread of pests.

Since India and the EU are both members of the WTO, the EU has to submit any changes in the maximum residue limit (MRL) to the WTO and India can scientifically challenge it under the WTO framework.

Further, the WTO member countries are encouraged to use international standards, guidelines and recommendations, where they exist. Specifically, the agreement encourages harmonisation on the basis of standards, guidelines and recommendations set by three international organisations, including the Codex Alimentarius Commission, the International Office of Epizootics (OIE), and the relevant international and regional organisations operating within the framework of the International Plant Protection Convention (see the text of the WTO SPS Agreement). Article 12 of the SPS Agreement established the Committee on Sanitary and

[4] Annex A on Definitions of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (called the SPS Agreement) accessible at https://www.wto.org/english/tratop_e/sps_e/spsagr_e.htm (accessed on 2 August, 2016)

Phytosanitary Measures to provide a regular forum for consultation, implement the provisions of the Agreement and further the objective of harmonisation of standards across countries.

It is important to note that globally acceptable standards such as the Codex Alimentarius can be higher than the national requirements of many countries, especially developing countries, but the SPS Agreement explicitly permits governments to choose not to use international standards. However, if countries align themselves to globally acceptable standards such as the Codex Alimentarius standards, then it is likely that a majority of the SPS issues in international trade could be resolved. The bigger concern is that, time and again, many countries, especially developed countries, impose more stringent standards than international standards with a view to protect their nations against potential health threats arising from the consumption of certain types of food products originating in developing countries (Nielsen and Anderson, 2001), which can act as a major non-tariff barrier to exports from developing countries (Henson and Loader, 2000). Many of these developing countries, including India, have small farm sizes, and poor farmers. While these farmers are keen to export, they may not have the right technology and training or access to the right inputs, including seeds and fertilisers, which could enable them to meet the conditions imposed by importing countries. In such cases, there is need for collaboration, sharing of information and sometimes support for upgrading food safety standards. The EU-India CITD programme aims to provide such support and this study tries to identify areas where there are support requirements.

While WTO acknowledges that some trade restrictions may be necessary to ensure food safety and animal and plant health protection, SPS restrictions can be used by member countries to protect their domestic producers from economic competition. To reduce possible arbitrariness in decisions and encourage consistent decision-making, the agreement clarifies which factors should be taken into account in the assessment of the risk involved. It points out that measures to ensure food safety and to protect the health of animals and plants should be based as far as possible on the analysis and assessment of objective and accurate scientific data. Therefore, there is a need to collect and collate the data for challenging an SPS measure.

One key issue that needs consideration here is that due to differences in climate, existing pests or diseases, or food safety conditions, it is not always appropriate to impose the same SPS requirements on food, animal or plant products coming from different countries. Therefore, SPS measures sometimes vary, depending on the country of origin of the food, animal or plant product concerned. This is taken into account in the SPS Agreement and thus, using this provision, an importing country/region such as the EU, can consider an exporting country like India more risky than other trading partners such as the US. For example, India has been identified as one of the third countries[5] with the risk of foot and mouth disease (FMD). This implies that the dairy products from India have to undergo various heat treatments before being exported to the EU.[6]

5 Third countries are countries that are outside the EU.

6 For more details, see COMMISSION REGULATION (EU) No 605/2010. Available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:175:0001:0024:EN:PDF (accessed on 6 April, 2017)

The WTO member countries are required to notify other countries of any new or changed SPS requirements that can affect trade. They have to set up offices (called "Enquiry Points") to respond to requests for more information on new or existing measures. They also have to share information on how they apply their food safety and animal and plant health regulations. This enables member countries to understand the national standards of their trading partners. The information about SPS measures undertaken by the EU is available to Indian policymakers and industry through this route.

The EU-India CITD programme serves as a platform to help Indian stakeholders understand EU food safety standards within the framework of the WTO's SPS agreement. While India and the EU are yet to sign a comprehensive trade agreement, the next chapter highlights how trade agreements can help to address product specific issues.

Chapter 2: Agriculture Trade between India and the EU: Trends, Regulatory Scenario and Treatment in Trade Agreements

World Bank statistics for the year 2013[7] indicate that around 60 per cent of India's land area was under cultivation. Given the size of the Indian sub-continent, it is larger than many developing and developed countries in real terms.

India's crop production has increased over the years and India has transformed itself from a food deficit country to a food surplus country.[8] Crop production in India is dominated by food grains, with cereals and pulses accounting for 63.6 per cent of the gross cropped area in 2013-14. Fruits and vegetables accounted for 8.3 per cent of the total cropped area in the same year. [9] Globally, India is the largest producer of dairy products such as milk and fruits such as mangoes. It is the second largest producer of rice, groundnuts and many vegetables.[10] With its large and growing production of fruits, vegetables and dairy products, India has changed its agriculture trade policies over the years and the country is now exporting a number of agricultural commodities to the rest of world.

World trade in agricultural products was valued at approximately USD 3.3 trillion in 2015.[11] In 2015, the EU[12] was the largest exporter[13] of agricultural commodities with a share of 10 per cent in the world export of agricultural commodities while India was the ninth largest exporter with a share of 2.2 per cent.[14] With a share of 10 per cent in total imports of agriculture commodities in 2014, the EU was the largest importer while India had the 10th position with a share of one per cent.[15] The share of agricultural commodities[16] in India's total trade basket

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7 Accessible at http://data.worldbank.org/indicator/AG.LND.AGRI.ZS (accessed on 8 November, 2016)

8 Hoda and Gulati (2013)

9 NITI Aayog (2015)

10 Annual Report of the Ministry of Food Processing Industries for 2014-15 accessible at http://mofpi.nic.in/sites/default/files/annualreport201415eng.pdf_0.pdf (accessed on 9 November, 2016)

11 Calculated using the World Trade Organization's Statistical Review, Table No. A14 accessible at https://www.wto.org/english/res_e/statis_e/wts2016_e/wts16_chap9_e.htm (accessed on 19 December, 2016)

12 European Union (EU) since 2013 refers to EU 28 including Austria (1995), Belgium (1958), Bulgaria (2007), Croatia (2013), Cyprus (2004), Czech Republic (2004), Denmark (1973), Estonia (2004), Finland (1995), France (1958), Germany (1958), Greece (1981), Hungary (2004), Ireland (1973), Italy (1958), Latvia (2004), Lithuania (2004), Luxembourg (1958), Malta (2004), Netherlands (1958), Poland (2004), Portugal (1986), Romania (2007), Slovakia (2004), Slovenia (2004), Spain (1986), Sweden (1995) and the United Kingdom (1973). Historical trade data collected for the EU corresponds to those countries that were members of the EU during the period for which the data is collected. For instance, data for the period before 2013 will not include Croatia and it will represent EU 27 only.

13 Considering intra-EU and extra-EU agricultural trade

14 For details, see WTO (2016),"World trade statistical review 2016"accessible at https://www.wto.org/english/res_e/statis_e/wts2016_e/wts2016_e.pdf (accessed on 7 December, 2016)

15 For details see Commodity-wise Trade Profile of the WTO accessible at https://www.wto.org/english/res_e/statis_e/world_commodity_profiles15_e.pdf (accessed on 23 November, 2016)

16 For the purpose of this study, harmonised system (HS) of classification is used for analysing trade in agricultural commodities. These include all categories from HS 04 to HS 21 excluding HS05, 06, 13, 14 and 16. A list of commodities at the 2-digit level is given in Appendix A2.1. Certain categories include one or two relevant items (for instance, HS 06 include tubers); however, these are a very small proportion of trade and, therefore, they are not included in the overall calculation. The classification includes both fresh and processed agricultural products, as defined under the HS Codes.

was 6.06 per cent in 2015-16.[17] The EU is India's largest trading partner for trade in agricultural commodities.[18] India has a positive balance with the EU for agricultural commodities (fresh and processed). Some of the key items of agricultural export from India to the EU are frozen shrimps and prawns, cashew nuts, fresh grapes and husked rice. The positive trade balance with the EU makes EU a key export market for Indian exporters, farmers and processors. Detailed bilateral agricultural trade data for India and EU are presented in Section 2.2.

Realising the importance of the EU as a key export market, joint efforts have been made by the Indian Government and the EU to facilitate trade in agricultural commodities. For instance, India and the EU have constituted joint working groups on agriculture and marine products, technical barriers to trade and SPS issues, and food processing industries. These joint working groups meet regularly to enhance sector-specific co-operation.[19] The EC funded CITD is another example of government-to-government collaboration.

India imports technology from the EU. For instance, Lemken GmbH and Co. from Germany and Maschio Gaspardo Group from Italy are important suppliers of agricultural machinery to India and these companies are expanding their presence in the Indian market. Further, a number of food businesses from the EU member states are present in India. These include Unilever plc [United Kingdom (UK)], Danone (France), Lactalis Group (France) and Associated British Foods (UK). Some of them have established wholly-owned subsidiaries in India while others have entered into joint ventures with Indian companies. Collaboration with companies from the EU has enabled Indian companies to access best global practices. This has also helped EU companies to access the large and growing Indian market.

The above discussions highlight that bilateral trade, investment from the EU and collaboration and knowledge sharing in agricultural products is important for both India and the EU. However, despite efforts from both sides, there are several barriers to trade in agricultural commodities between India and the EU. First, of course, is the tariff barrier. According to the WTO, the average tariff rates on agricultural products (most favoured nation) applied is 33.4 per cent for India and 12.2 per cent for the EU.[20] However, in certain categories such as dairy products, the EU imposes a higher average tariff (42.1 per cent) as compared to India (33.5 per cent). For certain products, there is a Generalised Scheme of Preferences (GSP),[21] which is discussed in the product-specific cases studies.

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17 Calculated from the Directorate General of Foreign Trade (DGFT) database

18 Calculated from the Directorate General of Foreign Trade (DGFT) database

19 See http://www.mea.gov.in/Portal/ForeignRelation/European_Union_13_01_2016.pdf (accessed on 9 November, 2016)

20 For details see https://www.wto.org/english/res_e/booksp_e/tariff_profiles15_e.pdf (accessed on 10 November, 2016)

21 The EU's Generalised Scheme of Preferences (also known as Generalised System of Preferences GSP) allows developing countries to pay less or no duties on their exports to the EU. The EU grants GSP to some Indian commodities (which are discussed in product-specific case studies), which leads to lower tariffs and hence India benefits from EU's preferred treatment. For details see: http://ec.europa.eu/trade/policy/countries-and-regions/development/generalised-scheme-of-preferences/ (accessed on 3 March 2017).

The second and more crucial issue affecting trade in agricultural commodities is related to the SPS measures adopted by different countries. As mentioned earlier, SPS measures are legal and warranted under the WTO. However, often the standards imposed by developed countries, including the EU, are higher than those imposed by developing countries such as India and it is difficult for developing countries to meet them due to technical and resource constraints. In such circumstances, these measures become barriers to trade. There are different national and local bodies in each country administering these standards. It, therefore, is important to understand the institutional and regulatory structures in India and the EU before analysing the trends and patterns in trade.

2.1 Institutional Structure and Regulations for Ensuring Quality of Food Products

In both India and the EU, there are multiple authorities involved in health and food safety standards. This section presents the risk analysis system in the EU and the institutional and regulatory structure related to food standards in India.

2.1.1 Risk Analysis in the EU

The General Food Law created a European food safety system in which responsibility for risk assessment (science) and for risk management (policy) are kept separate. The Food Law is based on three inter-related components of risk analysis:

a. Risk assessment, which is dealt with by the European Food Safety Authority (EFSA)

b. Risk management – The Directorate-General for Health and Food Safety (DG SANTE) is the risk manager

c. Risk communication – Rapid Alert System for Food and Feed (RASFF) and European Union Notification System for Plant Health Interceptions (EUROPHYT) are the tools for risk communication

The EFSA deals with risk assessment and also has a duty to communicate its scientific findings to the public. It is funded by the EU and operates independently of the European legislative and executive institutions (Commission, Council, and Parliament) and EU member states.[22]

The risk manager, DG SANTE, is a Directorate-General of the EC. The DG SANTE is responsible for the implementation of EU laws on the safety of food and other products, on consumers' rights and on the protection of people's health.[23]

The RASFF was put in place to provide food and feed control authorities with an effective tool to exchange information on measures taken to eliminate serious risks detected in relation to food or feed. This exchange of information helps EU member states to act rapidly and in a co-

[22] For details see https://www.efsa.europa.eu/en/aboutefsa (accessed on 13 February, 2017)

[23] For details see http://ec.europa.eu/dgs/health_food-safety/about_us/who_we_are_en.htm (accessed on 13 February, 2017)

ordinated manner in response to a health threat caused by food or feed. Its effectiveness is ensured by keeping its structure simple: it consists essentially of clearly identified contact points in the EC, EFSA and European Economic Area (EEA) and at the national level in member countries, exchanging information in a clear and structured way by means of templates.

The RASFF has been established as a network involving the member states, the EC as member and manager of the system and the EFSA. Whenever a member of the network has any information relating to the existence of a serious direct or indirect risk to human health arising from food or feed, this information is immediately notified to the Commission under the RASFF. The Commission immediately passes on this information to members of the network (all the nations that are involved in it within the EU).

The other system of risk communication is the EUROPHYT. It is a notification and rapid alert system dealing with interceptions of consignments of plants and plant products (including fruits and vegetables) imported into the EU or being traded within the EU itself for plant health reasons. EUROPHYT has been established and is run by the Directorate General for Health and Consumers of the EC. It provides essential support to implement preventive measures by ensuring that data on risks to plant health from trade in plants and plant products is up-to-date and accurate.[24] EUROPHYT is a web-based network and database. It connects Plant Health Authorities of the EU member states and Switzerland, the EFSA and the DG SANTE of the EC. The main features of this Network are given in Box 2.1.

Box 2.1: Features of the EUROPHYT Network

- Notification of interceptions: Plant health authorities of the EU member states and Switzerland enter data about interceptions they have made of non-compliant consignments into EUROPHYT electronically, via a direct web-link.
- A Rapid Alert System: EUROPHYT immediately notifies the plant health authorities of member states and Switzerland of each interception. In the case of interceptions of imports from non-EU countries, the plant health authority of the exporting country also receives immediate notification in the form of an e-mail.
- Database and information system: All notifications are stored in a structured database. Members of the EUROPHYT network have full access to the data, making it possible to analyse trends and produce statistics.
- Reports: Standard weekly, monthly and annual reports are produced for different users

Source: http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/network/index_en.htm (accessed on 28 June, 2016)

[24] http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/index_en.htm (accessed on 28 June, 2016)

The main objective of EUROPHYT is to help protect the territory of the EU from the introduction and spread of new pests and plant diseases to reduce or eliminate the economic and/or environmental impact of harmful organisms and reducing the need for pesticide use.

2.1.2 Institutional Structure and Regulatory Framework in India

Food safety is a shared responsibility in India as in the case of the EU. India has a quasi-federal government structure. Like the EC, which works closely with its member states, the Indian central government works with state governments on issues related to food safety and standards. There is nevertheless a key difference. While the EU has uniform standards for domestic consumption, imports and exports, in India, there are different standards and regulatory bodies for agriculture and processed food meant for the internal market/domestic consumption (including imports) and agriculture commodities and processed food meant for exports. Some of the important bodies engaged in international trade and food safety regulations include the following:

- **Food Safety and Standards Authority of India (FSSAI),** under the Ministry of Health and Family Welfare, regulates the domestic market and imports, but cannot regulate exports and does not have any jurisdiction over farmers. Thus, FSSAI in India has no role in exports or in ensuring traceability from farm to the final consumer, unlike in the EU and its member states.
- **Ministry of Agriculture & Farmers Welfare** is the key authority for promoting agriculture and farmers' welfare.
- **Directorate of Plant Protection, Quarantine and Storage,** under the Ministry of Agriculture & Farmers Welfare, regulates issues such as pest management, plant quarantine, and plant protection for imports and exports. Export consignments have to obtain a sanitary and phytosanitary certificate from the Directorate of Plant Protection, Quarantine and Storage to ensure that the product is free of pests or insects for exports to the EU, the authorities also confirm if the consignments have undergone the pest treatments prescribed by the EU. At present, there are 57 laboratories (or stations) under the Directorate of Plant Protection, Quarantine and Storage that are authorised to undertake the inspections. Once the products are approved, the Directorate also ensures that there is no infestation while the products are transported from their facilities to Indian ports.
- **Export Inspection Council (EIC)** of India was set up by the Government of India under Section 3 of the Export (Quality Control and Inspection) Act, 1963 (22 of 1963). The EIC is a regulatory authority operating under the Department of Commerce, Ministry of Commerce and Industry, and it is India's official export inspection and certification body. Its function is to ensure the development of India's export trade through quality control and pre-shipment inspection. The EIC is the official control agency for export of certain agriculture produce such as fish and fishery products, animal casings, feed additives and pre-mixture, Basmati rice, crushed bones gelatin ossein, peanuts and peanut products to the EU. A health certificate is needed from the EIC to export products such as peanuts and peanut products to the EU.

- **Agricultural and Processed Food Products Export Development Authority (APEDA)** was established by the Government of India under the Agricultural and Processed Food Products Export Development Authority Act passed by Parliament in December, 1985. APEDA is under the Department of Commerce, Ministry of Commerce and Industry. It acts as a promotional body for Indian exports for various agricultural products such as fruits, vegetables, dairy products, cereals, and groundnuts. When established, APEDA was only a promotional body, not a regulatory one. Recently, due to issues faced by exporters of various products (such as table grapes and peanuts), APEDA has been the nodal agency to set up a traceability system known as *TraceNet* for various products such as grapes, mangoes and peanuts. Under this system, processes for exports to the EU and other countries are laid down by APEDA and products are tested in APEDA approved laboratories to meet EU requirements.

Apart from the government bodies mentioned above, there are several different boards, some of which have a regulatory role and some of which merely have a promotional role. These include the Spices Board of India, which looks after the promotion, quality control and regulation of Indian spice exports. The approval of Spice Board is needed for the export of certain spices such as turmeric (*haldi*). The Tea Board of India promotes export of tea and provides certain subsidies to tea exporters; the Marine Products Export Development Authority (MPEDA) looks after the export promotion of marine products from India, while the Coffee Board promotes export of coffee.

In India, exports of agriculture products have to face higher standards as compared to domestically produced goods and imports, especially for exports to developed country markets such as the EU and the US. The food standards for the products meant for domestic consumption and imports are regulated by the FSSAI, which does not have any jurisdiction over exports and farmers. Exports have to adhere to the importing country standards, and these standards may vary depending on the importing country. Unlike the EU, which has more rigid standards than the Codex Alimentarius, the FSSAI has pegged its standards with the Codex Alimentarius. Across most agricultural products, in India, domestic standards are usually lower and less rigid compared to those in countries such as the US, Japan and Canada and regions such as the EU. More recently, a number of developing countries have imposed higher food safety standards than India (for example, Bhutan, South Africa and Kenya) while some other countries may have lower standards than India.

Focusing on the key differences in the implementation of food safety standards in India and the EU, the EFSA has laid down clear guidelines for various categories of products and for good agricultural practices to be followed at the farm level. It has established a traceability system to the farm level. In India, the FSSAI is yet to have guidelines for some product categories (such as organic products) and its guidelines are not applicable at the farm level. APEDA is trying to develop the traceability system and in a number of products it has developed the system successfully. Existing literature shows that the incidence of the use of chemicals in Indian farming is high and few farms follow good agricultural practices which can lead to product rejection in export markets and this is an SPS barrier.

The EFSA regularly conducts scientific research on approved MRLs for different chemicals, and based on such research, the MRLs are revised. India is yet to conduct such research on a regular basis and there are hardly any consumer nutrition surveys to understand the adverse impact of the consumption of food with high chemical residue content.

The tracking system in the EU is highly sophisticated. The EU has various portals (such as the RASFF and the EUROPHYT) for listing rejections of imported food products, which Indian exporters and APEDA and other agencies can check regularly. Although various Indian exporters check the EUROPHYT and RASFF portals at an individual level to keep track of rejected shipments, India is yet to have such an online system of tracking imports and exports. In India, APEDA tracks information about shipments rejected at various ports in the EU and passes on the information to exporters. The Directorate of Plant Protection, Quarantine and Storage follows the EUROPHYT interceptions and, in some cases, is appraised by exporters regarding the issues raised by the EC. The WTO Centre of the Indian Institute of Foreign Trade tracks SPS issues raised in the WTO. India is yet to develop an indigenous portal on the lines of EUROPHYT or RASFF.

Indian exporters exporting to developed countries such as the EU and the US often have to also adhere to private standards of global retailers and manufacturers in those countries, which are stricter than the country standards. Although these standards are voluntary, importers want exporters to adhere to them. In the case of India, there are hardly any private standards and the bulk of food items are still sold through the informal or non-corporate sector in the domestic market.

As developed countries are becoming stricter on food safety standards, several authorities within India are now responsible for administering these standards for exports. The procedure for export of products from India varies across different products and has been explained in detail in Chapters 3 to 11. Overall, there are three key agencies involved in providing product approval for exports in the selected products covered in this report. These are the EIC, APEDA and the Directorate of Plant Protection, Quarantine and Storage. Exporters have to follow the standards and procedures for inspection set by all these agencies in approved laboratories. The laboratories can be approved by APEDA or EIC. The EIC has the broad mandate to inspect the quality of exported products and ensure that they meet the importing country's requirements. In certain product categories like peanuts, grapes and okra, APEDA has set up a traceability system. In the case of peanuts specifically an exporter has to register with EIC for export control and APEDA for *TraceNet* while they also register with an export promotion council under the Ministry of Commerce and Industry known as Indian Oilseeds and Produce Export Promotion Council (IOPEPC). Thus, the exporter has to register with three agencies namely EIC, IOPEPC and APEDA for different activities. The Directorate of Plant Protection, Quarantine and Storage, under the Ministry of Agriculture & Farmers Welfare, regulate issues such as pest management, plant quarantine, and plant protection for imports and exports.

Overall, despite the presence of a sound regulatory framework, Indian exporters have been facing a number of SPS issues in key markets such as the EU. These are discussed in details in

the case studies. The next section provides a snapshot of bilateral trade in agricultural products between India and the EU.

2.2 Bilateral Trade in Agricultural Products

Bilateral trade data for India and the EU for agricultural products can be obtained from various sources. These are given below:

- **Eurostat Database:** The EU has a database known as the Eurostat, which reports statistics on EU's import of agricultural products from India. However, there is an issue with this database. In the case of agricultural commodities exported from India to the EU, disaggregated data at the 8-digit level is not available. For example, Eurostat data for mangoes is not available separately but in the combined category under 'fresh or dried guavas, mangoes and mangosteens' [Harmonised System (HS) 08045000]. For Basmati rice, the 8-digit category is also not clearly identifiable in this database. Since the project requirement has been to study specific products such as mangoes and Basmati rice, this database could not be used. It has been used for certain products such as dairy products for which disaggregated data is available.
- **Directorate General of Commercial Intelligence and Statistics Database:** The Directorate General of Commercial Intelligence and Statistics (DGCI&S), Kolkata, Ministry of Commerce and Industry, Government of India, is the primary organisation for the collection, compilation and dissemination of India's trade statistics. The DGCI&S also provides the data for each product category as is desired by the client, but there is a charge associated with it.
- **The Directorate General of Foreign Trade (DGFT) Database:** The DGFT, which is also under the Ministry of Commerce and Industry, sources data from the DGCI&S and the data is made available for free access but in a prescribed format. The data is available as per the Harmonised System of Classification, disaggregated to the 8-digit level. As per the standard data collection norm of the Indian government, the data is collected and presented for the financial year (April to March).[25] This database has been used in the report.
- **APEDA Database:** APEDA provides data for both production and export of agricultural commodities. However, the data is available for broad commodities rather than their disaggregated classifications. It is worth mentioning that there are certain discrepancies between the data provided by DGFT and APEDA for some product categories.

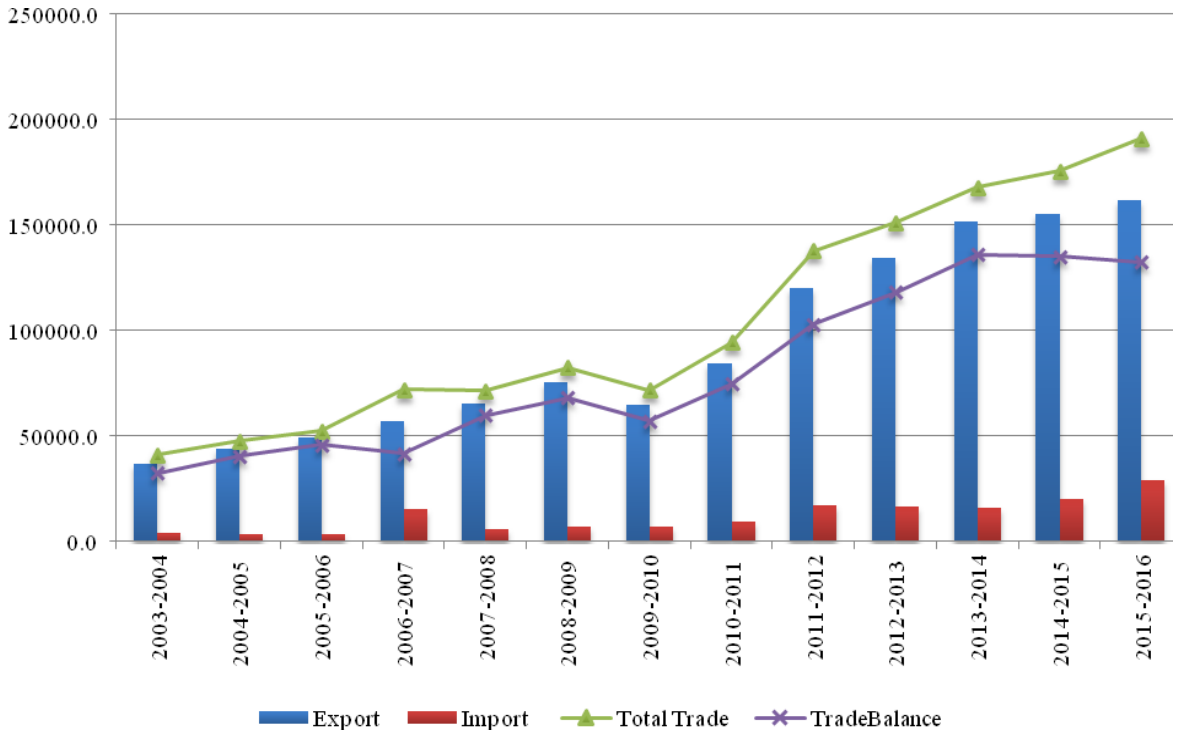
  Taking into account the limitations and advantages of statistics collated by the above sources and the requirements of this study, the data for this study has primarily been taken from the DGFT and APEDA.

  According to DGFT data, India's total trade with the EU in agricultural commodities amounted to Indian rupee (INR) 191.28 billion in 2015-16. In the same year, India's exports to the EU amounted to INR 161.9 billion and imports were valued at INR 29.3 billion, over

[25] Financial year in India is from 1st April to 31st March of each year.

five-fold less. Overall, India's positive trade balance in the case of agricultural commodities is large and it had been rising until 2014 (see Figure 2.1).

Figure 2.1: India's Trade in Agricultural Commodities with the EU during 2003-04 and 2015-16 (in INR Million)



Source: Author's compilation from the DGFT Database.

The EU's share in India's total export of agricultural commodities was 13.1 per cent in 2015-16, but it has declined over the last decade from 19.9 per cent in 2005-06.[26] India's share in the EU's import of agricultural products was only 2.6 per cent in 2015. In the same year, India was the 9th largest import source for the EU, after Brazil, the US, Argentina, China, Turkey, Switzerland, Indonesia and Ukraine.[27]

In terms of individual commodities at the 2-digit level, the top items of export from India to the EU in 2015-16 were coffee, tea, mate and spices, edible fruits and nuts, cereals, animal or vegetable fats and oils and oil seeds, among others. The top items of imports from the EU include animal or vegetable fats and oils and their cleavage products; preparations of edible fats; animal or vegetable waxes and edible vegetables and certain roots and tubers. While overall India has a positive trade balance, in the case of certain product categories such as dairy products and cocoa and cocoa preparations, India has a negative trade balance (see Table 2.1).

[26] Calculated from the data provided by the DGFT

[27] For details see https://ec.europa.eu/agriculture/sites/agriculture/files/trade-analysis/statistics/outside-eu/countries/agrifood-india_en.pdf (accessed on 29 November, 2016)

Table 2.1: India's Trade with the EU in Selected Agricultural Commodities in 2015-16 (in INR Million)

HS Code	Commodity	Exports	Imports	Total Trade
4	Dairy produce; birds' eggs; natural honey; edible prod. of animal origin, not elsewhere spec. or included	1013.8	1981.0	2994.8
7	Edible vegetables and certain roots and tubers	10078.8	5281.1	15359.8
8	Edible fruit and nuts; peel or citrus fruit or melons	25671.3	1957.8	27629.0
9	Coffee, tea, mate and spices	47689.6	1125.3	48814.9
10	Cereals	21692.4	843.4	22535.8
11	Products of the milling industry; malt; starches; insulin; wheat gluten	846.3	842.5	1688.8
12	Oil seeds and olea, fruits; misc. grains, seeds and fruit; industrial or medicinal plants; straw and fodder	14554.5	1758.5	16313.1
15	Animal or vegetable fats and oils and their cleavage products; pre. edible fats; animal or vegetable waxes	16454.5	7490.0	23944.5
17	Sugars and sugar confectionery	4613.3	2573.7	7186.9
18	Cocoa and cocoa preparations	918.3	2037.3	2955.6
19	Preparations of cereals, flour, starch or milk; pastry cook products	2685.9	1032.9	3718.8
20	Preparations of vegetables, fruit, nuts or other parts of plants	10375.0	1003.2	11378.2
21	Miscellaneous edible preparations	5338.4	1427.3	6765.8
Total		161932.1	29354	191286.1

Source: Author's compilation from the DGFT Database.

Within agricultural commodities, the top ten items of export to the EU and the top ten items imported from the EU are presented in Table 2.2 and Table 2.3.

Table 2.2: India's Top Ten Items of Agricultural Export to the EU in 2015-16 (in INR Million)

Rank	HSCode	Commodity	Exports (in INR Ml.)
1	10063020	Basmati rice	19299.6
2	15153090	Castor oil and its fractions other than edible grade	12469.3
3	08013220	Cashew kernel, whole	10356.8
4	08061000	Grapes fresh	9077.5
5	09011149	Coffee rob cherry other grade	6742.0
6	09024020	Tea black, leaf in bulk	6239.9
7	09011141	Coffee rob cherry	6074.7
8	12074090	Other sesamum seeds w/n broken	6039.1
9	07122000	Onions dried	3911.2
10	12119032	Psyllium husk (Isobgul husk)	3822.1
Total Agricultural Export			161932.1
Share of Top Ten products in Total Agriculture Export			51.9

Source: Compiled by authors from DGFT database.

Table 2.3: India's Top Ten Items of Agricultural Import from the EU in 2015-16 (in INR Million)

Rank	HSCode	Commodity	Exports (in INR Ml.)
1	07131000	Peas (pisum sativum) dried and shelled	5081.0
2	15141120	Crude rape oil	1808.1
3	15099010	Olive oil and its fractions (excluding virgin) of edible grade	1713.8
4	15071000	Soya bean crude oil w/n degummed	1505.2
5	08081000	Apples fresh	1178.7
6	17021110	Lacts and lacts syrup containing 99% or more lacts in solid form	991.8
7	18069010	Chocolate and chocolate products	833.9
8	09092110	Of seed quality	818.1
9	15149190	Crude rape seed oil	790.8
10	17021190	Lacts and lacts syrup containing 99% or more lacts other than in solid form	748.4
Total Agricultural Imports			29353.9
Share of Top Ten products in Total Agriculture Import			52.7

Source: Compiled by authors from DGFT database.

The share of the top ten products in total agricultural exports and imports indicates that India has a fairly diverse trade basket in agricultural commodities trade with the EU. The export of processed products such as oil, coffee and tea is high. Among the top ten export commodities, processed commodities (including dry fruits and seeds) account for a 96.7 per cent share.

For the purpose of this study, nine broad product categories namely – Basmati rice, mangoes, grapes, mushrooms, eggplant, green beans, green peas, peanuts and dairy products (excluding natural honey), have been selected. The share of these commodities in India's exports to the EU and the world during 2015-16 is presented in Table 2.4.

Table 2.4: Export of Selected Commodities to the EU and the World in 2015-16 (in INR million)

Commodity and Code		Exports to EU	World Export	EU's Share
1. Dairy Excluding Natural Honey, which is HS 0409				
HS 04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	1002.8	14393.8	7.0
2. Mangoes fresh and processed				
HS 08045020	Mangoes fresh	338.8	3206.3	10.6
HS 08045030	Mangoes sliced dried	314.4	449.4	70.0
HS 08045040	Mango pulp	1728.5	7961.8	21.7
HS 08129010	Mango slices in brine	5.3	12.7	42.0
HS 11063030	Flour of mango	5.8	17.4	33.3
HS 12079920	Mango kernel w/n broken	0	0	
HS 20079910	Jams, jellies, marmalade, etc., of mango	3329.3	7429.0	44.8
HS 20089911	Mango squash	233.5	610.1	38.3
HS 20098910	Mango juice	9.8	55.9	17.7
3. Grapes fresh and processed excluding wine (HS 22042190, 22042990, 22059000) and must (HS 20096100, 22043000)				
HS 08061000	Grapes fresh	9077.4	13622.5	66.6
HS 08062090	Sultanas and other dried grapes	7.3	102.4	7.2
HS 20092900	Other grape fruit juice value>20	0	0.2	
4. Peas fresh, processed and preserved				
HS 07081000	Peas shelled or unshelled, fresh or chilled	23.4	53.9	43.4
HS 07102100	Peas shelled or unshelled, frozen	0.4	176.1	0.3
HS 07131000	Peas (pisum sativum) dried and shelled	0	243.2	0

Commodity and Code		Exports to EU	World Export	EU's Share
HS 20054000	Peas (pisom sativum) prepared/preserved, not frozen	0	1.7	0.0
5. Green bean				
HS 07082000	Beans shelled or unshelled, fresh or chilled	12.4	16.3	76.5
HS 07102200	Beans shelled or unshelled, frozen	18.3	64.3	28.5
HS 07133100	Beans of the spp vigna mungo, hepper or vigna radiata, wilczek dried and shelled	79.8	732.4	10.9
6. Basmati Rice				
HS 10063020	Basmati rice	19299.5	227185.9	8.5
7. Peanut				
HS 120241	Ground-nut, not roasted or otherwise cooked, whether or not shelled or broken-in shell	6.7	1105.0	0.6
HS 120242	Ground-nut, not roasted or otherwise cooked, whether or not shelled or broken-in, shelled whether or not broken	71.2	38673.5	0.2
8. Eggplant				
HS 07093000	Aubergines (egg plants) fresh or chilled	0.01	0.9	0.8
9. Mushroom				
HS 07095100	Mushrooms, fresh or chilled	0.1	0.3	43.5
HS 07115100	Mushrooms of genus agaricus provisionally preserved	0	21.8	0
HS 07123100	Mushrooms of genus agarigvs, dried, whole, cut, sliced, broken	190.4	247.8	76.8
HS 20031000	Mushrooms, prepared/preserved	392.9	699.6	56.2
HS 20039090	Other mushrooms and truffles	0	0.7	0.0

Source: Compiled by authors from the DGFT database.

2.3 Assessment of SPS Provisions in Trade Agreements: The Case of the EU and India [28]

With the proliferation of regional and bilateral trade agreements, trading partners to bilateral free trade agreements (FTAs) often attempt to resolve specific SPS issues affecting market access in their agreements. While developed countries such as the EU and the US tend to ensure regulatory synergies and compliance through their trade agreements, India's approach so far has been to reiterate the WTO SPS Agreement. The next section discusses how the EU addresses the SPS issues under its trade agreements while the following section examines how India addresses the SPS measures in its trade agreements. The chapter concludes by examining if an EU-India bilateral trade agreement can help to address the SPS barriers faced by Indian exporters in the EU.

2.3.1 Can SPS Barriers be Addressed through FTAs: EU's Approach

The EU's approach in its FTAs has been to carve out a larger policy space for social and precautionary aspects, as opposed to pure science-based risk assessment emphasised under the WTO. An assessment done by the London School of Economics and Political Science notes that this approach of the EU can be said to favour an "SPS-minus" approach, "in the sense that it wants an interpretation of precaution that allows for social as well as science-based risk assessment" (Heydon and Woolcock, 2009: pp. 7).

There are certain variations in EU's SPS chapters in trade agreements. The SPS Chapters in EU's FTAs with Korea and CARIFORUM (subgroup of the African, Caribbean and Pacific Group of States) are brief and fairly simple and do not have additional obligations beyond the WTO SPS Agreement. The three key EU FTAs where product-specific issues relating to equivalence, certification, etc., have been addressed, are the EU-Chile FTA, EU-Canada Comprehensive Economic and Trade Agreement (CETA) and the Transatlantic Trade and Investment Partnership (TTIP) with the US (this agreement is yet to be signed and the proposed text is referred to in the discussions). Of these, the EU-Chile FTA is the only one in force. The EU-Canada CETA is yet to be ratified by the EU, and some product-specific annexes have not yet been fully agreed on. The TTIP negotiations are still in progress and hence, product-specific annexes are not available. Table 2.5 presents a comparative analysis of these agreements. Overall, it appears that the EU-Canada approach is the most ambitious, which could be because of the similarity in regulations in the two countries.

It is clear from the assessment of the EU FTAs that when negotiating SPS chapters in any bilateral or plurilateral negotiation, it is important to focus on product-specific issues. In case any SPS measures are raised, the disease specific concerns that relate to those measures are to be reflected in the form of an Annexure or an Appendix.

[28] This section has been prepared by R.V. Anuradha, Partner, and Ronjini Ray, Associate at Clarus Law Associates

The underlying concept of "equivalence", however, is fundamentally premised on similarity in regulations in both the importing and exporting countries. This is more possible and likely when both countries are at the same level of development and have similar regulatory systems. This is reflected, for instance, in the EU-Canada CETA, where each country has recognised specific laws and regulations of the other as equivalent to its own. On the other hand, the EU-Chile FTA, which was signed in 2002, is yet to show any significant potential for resolving issues of recognition and equivalence. In fact, as noted in Table 2.5, while the FTA provides the blueprint for definitive criteria and timelines for assessment, it has in fact resulted in equivalence for only molluscs under fishery products.

The other interesting contrast between the EU-Canada CETA and EU-Chile FTAs is that while the former provides for definitive approval of establishments that would be certified for exports into the EU, the Chile FTA only provides for *provisional* approval, which is in the nature of a temporary approval process.

One of the main problems that exporters into the EU often face is the MRLs permitted in food and animal feedstuff after the application of approved pesticides. Internationally, the Codex Alimentarius Commission develops and maintains international standards for MRLs, but levels for many substances are still to be developed and agreed upon in international standard setting bodies such as the Codex Alimentarius (for example, the standards for ethnic sweets using milk as an ingredient). The SPS Agreement encourages countries to base their MRLs on those that the Codex Alimentarius Commission has set. Nevertheless, it is not uncommon for countries, in particular the EU, to set its own, stricter MRLs. When a government establishes MRLs that is more stringent than the relevant Codex Alimentarius standard, the government must do so consistently with Article 3 of the SPS Agreement, which calls for the government to provide either a scientific justification for that stricter standard or apply the standard in accordance with Article 5 of the SPS Agreement. While questions are often raised with regard to EU MRLs, no FTA that the EU has entered into so far addresses this aspect.

Table 2.1: Assessment of EU's FTAs: The SPS Chapter

Criteria	EU-CHILE	Proposed TTIP Text	EU-CANADA CETA
Equivalence/ Recognition/ Approval of Establishments	*Article 7* -Detailed consultation procedure laid down for determination of equivalence in Appendix VI. -Procedure includes strict timelines, sets out priorities for sectors that are to be decided by the Committee and provides exception for seasonal crops to justify delay. -Appendix V.A. is required to list priority sectors for the purpose of equivalence. As of now, it appears that only the sub-sector of 'bivalve molluscs' under the fisheries sector has been identified as a priority sector.[29] Appendix V.B lists the conditions for Provisional Approval for Establishments relating to the following categories: *Slaughter houses for different meat products; Establishments for fresh meat, poultry meat, meat products, milk and milk products, fish, eggs, etc.* The importing party has the authority to withdraw or suspend any equivalence provided, based on factual data, and needs to notify this in compliance with Food and Agriculture Organization (FAO) of the United Nations International Standard for SPS Measures No. 13 titled 'Guidelines for the notification of non-compliances and emergency action".	*Article 9* -WTO SPS elements reiterated. - Equivalence is based on principles set out in guidelines of international standard setting bodies: Codex Alimentarius Commission Guidelines on Judgment of Equivalence of SPS Measures (CAC/GL 53-2003) and International Standards for SPS Measures on recognition of equivalence ISPM 24 as well as Annex IV (yet to be negotiated) setting out the principle and guidelines for recognition of equivalence. - Special conditions that allow for a party to achieve the other party's appropriate level of protection. - Annex V (yet to be negotiated) listing products for which parties recognise each other's measures as equivalent which have simplified procedure for certification.	*Article 5.6* Similar to the approach in TTIP text. -Equivalence- principles and guidelines for recognition of equivalence are to be agreed to at a later stage (Annex 5-D). -Annex 5-E lists the area for which the importing party recognises that an SPS measure of the exporting party is equivalent to its own, as well as areas for which fulfilment of special conditions are recognised by the importing country. Areas, specified in Appendix 5-E, for which both Canada and EU have recognised as equivalent specific SPS measures in each other's countries including the following: *Embryos; Fresh Meat; Meat Products; Minced Meat, Meat Preparations; Processed animal proteins for human consumption; Rendered animal fat intended for human consumption; Animal casings for human consumption; Fishery products and live bivalve molluscs; Milk and Milk Products for human consumption; Animal casings not for human consumption; Bones, horns and hooves (except meals) and their products not for human consumption; Blood and Blood Products not intended for human consumption; Apiculture products not for human consumption; Wool, feathers and hair; Shell Eggs and Egg Products intended for human consumption.*

[29] Council Decision, 28 June, 2011: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011D0449&from=EN (accessed on 21 December, 2016)

Criteria	EU-CHILE	Proposed TTIP Text	EU-CANADA CETA
			There is a provision relating to approval of establishments by the importing country, the criteria for which is specified in Appendix 5F.
Regionalisation/ Compartmentalization	*Article 6* Procedure for decisions on regionalisation is laid out in Appendix IV. A and B for animal/fish diseases listed in Appendix III.A[30] and for pests listed in Appendix III.B.[31] Animal Diseases -Granting of special status is based on Appendix IV.C which lays down criteria for such status. - Importing party can seek guarantees for specific diseases not listed in Appendix III.A in accordance with the recommendations of standard setting organisations. -Specific timelines for technical consultation on zoning determinations. . Pests - Parties seeking regionalisation on pest status require explanation and supporting data in	*Article 10* Animal, Animal Products/By-products - Health status of zones in each party with respect to specific diseases is listed out in Annex II and criteria for recognising zoning is laid out in Annex III. - Full explanation/data and technical consultations may be requested by the importing party regarding determinations of zoning of the exporting party. - Special status can be granted to diseases not listed in Annex II based on OIE Terrestrial Code. - Importing party can seek guarantees only for diseases listed in Annex IV. - Specific timelines for technical consultation on zoning determination. Plants and plant products	*Article 5.5* -Similar to the proposed TTIP Text; level of detailing differs. Animal, Animal Products/By-products - Importing party cannot request technical consultations/data with regard to determination of regionalisation but may adopt an additional measure to achieve its appropriate level of protection. - No specific timelines for technical consultation on determining zoning. - Granting of special status is not based on OIE Terrestrial Code but based on Annex 5-E Plants and plant products - Recognition of pest-free areas is not based on FAO/IPPC international standards but as per guidelines in Annex 5-C (which is yet to be agreed).

[30] **Appendix III.A:** Foot-and-mouth disease; Swine vesicular disease; Vesicular stomatitis; African horse sickness; African swine fever; Bluetongue; Highly pathogenic Avian influenza; Newcastle disease (NCD); Peste des petits ruminants; Rinderpest; Classical swine fever; Contagious bovine pleuro-pneumonia; Sheep and goat pox; Rift Valley fever; Lumpy skin disease; Venezuelan equine encephalomyelitis; Glanders; Dourine; Enterovirus encephalomyelitis; Infectious haematopoietic necrosis (IHN); Viral haemorrhagic septicaemia (VHS); Infectious Salmon Anaemia (ISA); Bonamia ostreae; Morteilla refringens

[31] **Appendix III.B:** As regards the situation in Chile: (1) Pests not known to occur in any part of Chile; (2) Pests known to occur in Chile and under official control; (3) Pest known to occur in Chile, under official control and for which pest free areas are established. As regards the situation in the European Community: (1) Pests not known to occur in any part of the Community and relevant for the entire Community, or for part of it. (2) Pests known to occur in the Community and relevant for the entire Community. (3) Pests known to occur in the Community and for which pest free areas are established.

Criteria	EU-CHILE	Proposed TTIP Text	EU-CANADA CETA
	accordance with FAO International Standards for Phytosanitary Measures No. 4 & 8 - Timelines for consultations relating to decisions on pest-free areas.	- Recognition of concept of pest-free areas in accordance with FAO/IPPC international standards - Timelines for consultations relating to decisions on pest-free areas.	- No timelines for consultations relating to decisions on pest-free areas.
Import Requirements/ Verification/ Certification	*Article 10 (Verification); Article 11 (Import (checks and inspection fees)* - Specific commodities, listed in Appendix I.A and I.B, are not subject to import authorisations. (*Article 8.4)* - Appendix VII specifies guidelines for carrying out verification. - Laboratory tests for products listed in Appendix I.A at the request of the party and participation in periodical inter-comparative tests - Parties may also share results of verifications with third countries - Appendix VIII.A and VIII.B set out principles of import checks and its frequency rates respectively. - Parties may reciprocally reduce such frequencies. - Fees shall not be higher than the actual cost of service and should be equal to fee for inspection of similar domestic products. - Appendix VI laying down procedure for equivalence specifies a "Residue plan" when determining equivalence.	*Article 11 (Audit & Verification); Article 13 (Import Checks)* - Audits and verification shall be proportionate to the risks identified and shall be subject to technical consultations if requested by a party. - Audits and verifications must also be in accordance with Annex VII and internationally agreed guidelines including Codex Alimentarius Commission Guidelines on inspection and certification systems (CAC/GL 26-1997) and International Standards for SPS Measures on import regulatory system ISPM 20. - Annex IX setting out principles of import checks, fees, and frequency rates. - Inform exporting party in case of rejection with detailed information including laboratory results - Fees shall not be higher than the actual cost of service - Provision on interception of pests, inspection only in exceptional cases, and in case of non-compliance of consignment requirement of notification of such non-compliance and opportunity to contribute to relevant information. -No mention of MRL	*Article 5.8 (Audit & Verification); Article 5.10 (Import Checks)* - EU-Canada is not as elaborate as TTIP proposed text. **<u>Differences from TTIP:</u>** - Audits and Verification procedure: No specific reference to internationally agreed guidelines. -Import checks do not have provisions for interception of pests; inspection only in exceptional cases; in case of non-compliance of consignment, requirement of notification of such non-compliance and opportunity to contribute to relevant information, and requirement to provide laboratory results in case of rejection. - No mention of MRL
Institutional Mechanisms	*Article 16* - Not as extensive as EU-Canada FTA or TTIP proposed text	*Article 18* Joint Management Committee for discussion of various SPS aspects including resolving	*Article 5.14* - Same as Proposed TTIP Text; except the following:

Criteria	EU-CHILE	Proposed TTIP Text	EU-CANADA CETA
	However, EU-Chile FTA allows: - for third party members to participate in working groups - for committee meetings to be conducted by way audio/video conference.	SPS issues in an expeditious manner, establishing working groups (with expert level representatives and NGOs), for exchanging information.	**<u>Difference from TTIP</u>** - Joint Management Committee is required to review Annexes annually. - NGOs are allowed in the working groups.
Transparency	*Article 8 (Transparency and trade conditions), Article 12 (Information Exchange) and Article 13(Notification and Consultation)* -WTO- *plus* provisions in the form of enhanced notifications for animals and animal products, products of animal origin and plant and plant products listed in Appendix IA and IB with respect to: (i) animal or plant health risk, including any food control emergencies, (ii) measures affecting regionalisation decisions; (iii) pest/disease status; (iv) findings of epidemiological importance; (v) changes in prophylactic or vaccination policies - Strict timelines for notifications and including notification by way of email and fax. -Information exchange on: (i) significant events concerning commodities (ii) systematic development of standards and may include exchange of officials of competent authorities (iii) verification procedures, import checks, and scientific opinion (iv) progress on developing animal standards as well as rapid alerts relevant to trade. (v) immediate danger in relation to pests	*Article 14* WTO-*plus* provisions in the form of enhanced notifications with respect to: (i) pest/disease status; (ii) significant food safety issues; (iii) findings of epidemiological importance; (iv) structure of competent authorities. - Information exchange on results of: (i) official controls; (ii) import checks in case of rejected consignment (iii) risk analysis and scientific opinion	- Reaffirmation of WTO provisions. - Provisions relating to notification and reporting similar to the TTIP approach.

Criteria	EU-CHILE	Proposed TTIP Text	EU-CANADA CETA
Other/Assistance	WTO-*plus* co-operation requirement since the SPS Agreement only requires co-operation on the development of guidelines for the implementation of risk analysis. The EU-Chile FTA requires the following: - Co-operation between the 'auditor' and the 'auditee' in accordance with the provisions set out in this Appendix VII on verifications - Co-operation on agriculture and rural sectors and SPS measures focused on capacity building, mutual exchange of information, technical assistance and enhancing quality agricultural products, etc. (*Article 24 under Part III on Economic Cooperation in the Association Agreement*)	- Extremely specific co-operation requirements in relation to implementation of electronic certification procedures in accordance with Annex VIII. *(Article 12)*	- Parties shall co-operate to ensure efficient management of available resources. *(Article 5.7)*

Source: Compiled by authors from the EU-Chile FTA accessible at http://eur-lex.europa.eu/resource.html?uri=cellar:f83a503c-fa20-4b3a-9535-f1074175eaf0.0004.02/DOC_2&format=PDF; EU-Canada Comprehensive Economic and Trade Agreement (CETA) accessible at http://trade.ec.europa.eu/doclib/docs/2014/september/tradoc_152806.pdf; and the Provisional Transatlantic Trade and Investment Partnership (TTIP) for details see http://trade.ec.europa.eu/doclib/press/index.cfm?id=1230; (accessed on 20 December, 2016).

2.3.2 India's Approach with regard to SPS in FTAs

India's approach in its comprehensive agreements with Korea, Japan and Malaysia has been to reiterate the WTO SPS Agreement. The most significant WTO-*plus* approach is reflected in the India-Singapore Comprehensive Economic Co-operation Agreement (CECA), which has a specific chapter titled "Standards and Technical Regulations, Sanitary and Phytosanitary Measures". As the title suggests, this presents a combined approach to both SPS measures and technical barriers to trade.

The key WTO-*plus* elements in the India-Singapore CECA are as follows:

- Exchange of information requirements where considerations of health, safety or environmental protection warrant more urgent action with strict timelines whereas the WTO SPS Agreement only has a general obligation of notification of SPS measures.
- Article 5.7 specifies the procedure for determining and implementing equivalence set out in the respective Sectoral Annex and specifies that such an Annex will provide:
  (a) the procedures for determining and implementing the equivalence of each party's mandatory requirements;
  (b) the procedures for accepting the results of the conformity assessment and approval procedures; and
  (c) the regulatory authorities designated by each party.
- Annex 5-B on food products has relevance for SPS measures. The annex includes Appendix 1 on egg products including pasteurised egg powder of whole egg, egg yolk and egg albumen, which identifies regional authorities and their roles as well as conformity assessment authorities and their procedure/arrangement. It also includes a similar Appendix for milk powder, casein, whey protein concentrate, natural and processed cheese.
- Establishment of a joint committee on mutual recognition, whose functions include resolving questions, disputes and disagreement over registration, and establishing modalities on information exchange.

Thus, the India-Singapore CECA provides for the development of sector-specific annexes in which the countries would need to specify equivalence based on agreement between the parties. However, no such annexes have so far been developed.

2.4 The Way Forward

Overall, an analysis of different trade agreements and domestic policies shows that the SPS requirements in developed economies such as the EU may be rigid but trade agreements provide a platform to address and resolve product specific issues. A significant challenge that a country such as India is likely to face is regulatory equivalence with the EU at an overall level. What may instead make sense is to negotiate specific compliance requirements for exports to the EU. At present India does not have any mutual recognition agreement (MRA)

with the EU but the EU has recognised product specific compliance by EIC for specific food products. However, in the absence of an MRA, the EU reserves the right to not acknowledge the inspection and the testing procedures. For example, recently, the EC decided to test up to 50 per cent of India's shrimp consignments for residues such as chloramphenicol and nitrofurans, which was earlier 10 per cent.[32] According to the EC, this decision has been taken as the analytical tests undertaken by official control laboratories showed that the level of compliance of aquaculture products from India for human consumption as regards the presence of certain residues is unsatisfactory. If the two nations had an MRA such issues may not arise.

Since January 1, 2017, the EU has implemented the Registered Exporter System (REX) where the exporter with a REX number will be able to self-certify the 'Statement of Origin' of their goods being exported to the EU under the GSP scheme. This will help Indian exporters for products covered under the GSP scheme since this system is without any fee or charges. Specifically, under a bilateral agreement the EU may be requested to have a Registered Exporter System for its partner country, applicable to all food products and not only for GSP products. While both India and EU are taking measures, recognition of compliance requirements in a bilateral trade agreement such as the EU-India Bilateral Trade and Investment Agreement (BTIA) is likely to provide greater certainty for Indian exporters of agricultural products to the EU.

One of the areas in which the EU is likely to show reluctance is the emphasis on international standards and scientific justification for deviation from international standards. In this regard, it will be important for India to address product specific issues where it may need further clarity or explanation for EU's standards. Further, to challenge the EU, India will need to collect more data on MRLs for products in other developed countries. This is discussed in the case studies in the following chapters.

With regard to MRLs, close monitoring of EU regulations is required. While it may not be possible to successfully address SPS issues in a bilateral trade agreement, what the trade agreement can do is to put in place a system for information exchange and sharing of experiences on any specific SPS export barriers that a country may face. Further, such agreements can provide for a mechanism to speedily address problems of detention of food exports which again can lead to spoilage and contamination, especially in case of perishable exports, since these can lead to loss of revenue for both exporters and importers as discussed in the case studies.

Since, it is unlikely that India and EU may sign a trade agreement in the short run, India may push for product specific equivalence agreement with the EC. The WTO's SPS Agreement encourage member countries to recognise each other's conformity assessment systems based on international standards so that products certified in one country are accepted without the need for further inspection/testing by other countries through equivalence or MRA. Codex

[32] COMMISSION IMPLEMENTING DECISION (EU) 2016/1774 of 4 October 2016. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016D1774&from=EN (accessed on 11 April, 2017)

Alimentarius Commission also encourages such agreements with a view to avoid duplication of inspection and testing which can increase the cost of exports, and to ensure the health and safety concerns. The EU has entered into product specific MRAs and such agreements are possible with countries that have strong export control system. The content of the agreement may include, among others, provision for retesting and appeal in case of product rejection.

Appendix A2.1: List of Agricultural Commodities and their HS Code

HS Code	Commodity
4	Dairy produce; birds' eggs; natural honey; edible prod. of animal origin, not elsewhere spec. or included
7	Edible vegetables and certain roots and tubers
8	Edible fruit and nuts; peel or citrus fruit or melons
9	Coffee, tea, mate and spices
10	Cereals
11	Products of the milling industry; malt; starches; insulin; wheat gluten
12	Oil seeds and olea. fruits; misc. grains, seeds and fruit; industrial or medicinal plants; straw and fodder
15	Animal or vegetable fats and oils and their cleavage products; pre. edible fats; animal or vegetable waxes
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations
19	Preparations of cereals, flour, starch or milk; pastry cook products
20	Preparations of vegetables, fruit, nuts or other parts of plants
21	Miscellaneous edible preparations

Chapter 3: The Case of Fresh Mango and Mango Pulp Exports to the EU

India is one of the largest producers of fresh mangoes and mango pulp. The country is known to have some unique commercially grown varieties of the fruit, including varieties such as Alphonso and Kesar, which have a large export market. However, over the last few years, exports of fresh mangoes from India have faced rejections in the EU market and a subsequent ban on entry due to the presence of fruit flies. APEDA worked with exporters and state government agencies such as the Maharashtra State Agriculture Marketing Board to put a strong corrective mechanism in place and the EU has now lifted the ban on imports of fresh mangoes from India. Mango pulp is also a key export item from India to the EU.

This case study covers both fresh mango exports and exports of mango pulp and focuses on the experiences of the exporters and the issues that they face. This study is based on a primary survey of 50 respondents including farmers, processers, exporters, Maharashtra State Agriculture Marketing Board (MSAMB), APEDA, Directorate of Plant Protection, Quarantine & Storage, Department of Agriculture and state government officials. The interviews were conducted in Delhi, Mumbai, Pune and Ahmedabad.

The images depict Alphonso mangoes (left) and Kesar mangoes (right).

3.1 Overview of Fresh Mango and Mango Pulp Production in India

In India, mango is one of the most important commercially grown fruit crops. Indian mangoes come in various shapes, sizes and colours with a wide variety of flavours, aroma and taste. India is home to about 1,000 varieties of mangoes. However, only a few varieties are commercially cultivated throughout India. Some of the commercially grown varieties of mangoes include Chausa, Totapuri, Alphonso, Kesar, Neelum, Dashehari and Langra. Certain states grow certain specific varieties of mangoes; these are given in Table 3.1. Of these varieties, Alphonso, Kesar and Totapuri varieties are widely exported.

Table 3.1: Some Important Mango Varieties and States Where They are Cultivated

States	Important Varieties
Andhra Pradesh	Banganapalli, Totapuri, Suvarnrekha, Neelum
Gujarat	Alphonso, Kesar, Rajapuri
Karnataka	Banganapalli, Totapuri, Neelum, Alphonso, Pairi
Maharashtra	Alphonso, Kesar, Pairi
Uttar Pradesh	Bombay Green, Dashehri, Langra, Chausa, Amrapali

Source: APEDA. Available at http://agriexchange.apeda.gov.in/Market%20Profile/one/MANGO.aspx (accessed on 7 November, 2016)

Besides fresh mango, India is also a major exporter of mango pulp to the world. Mango pulp is prepared from selected varieties of fresh mango. The preparation process involves cutting, de-stoning, refining and packing. In the case of the aseptic[33] product, the pulp is sterilised and packed in aseptic bags. The refined pulp is also packed in cans, hermetically sealed and retorted. Frozen pulp is pasteurized and deep-frozen in plate freezers. Mango pulp/concentrate is suited for conversion to juices, nectars, drinks, jams, fruit cheese and various other kinds of beverages. It can also be used in puddings, bakery filling, fruit based meals for children and flavours for ice creams, yoghurt and confectionery. The main varieties of mango pulp are Alphonso mango pulp, Totapuri mango pulp and Kesar mango pulp.[34] Of these, Totapuri mango pulp is the most popular variety that is exported.

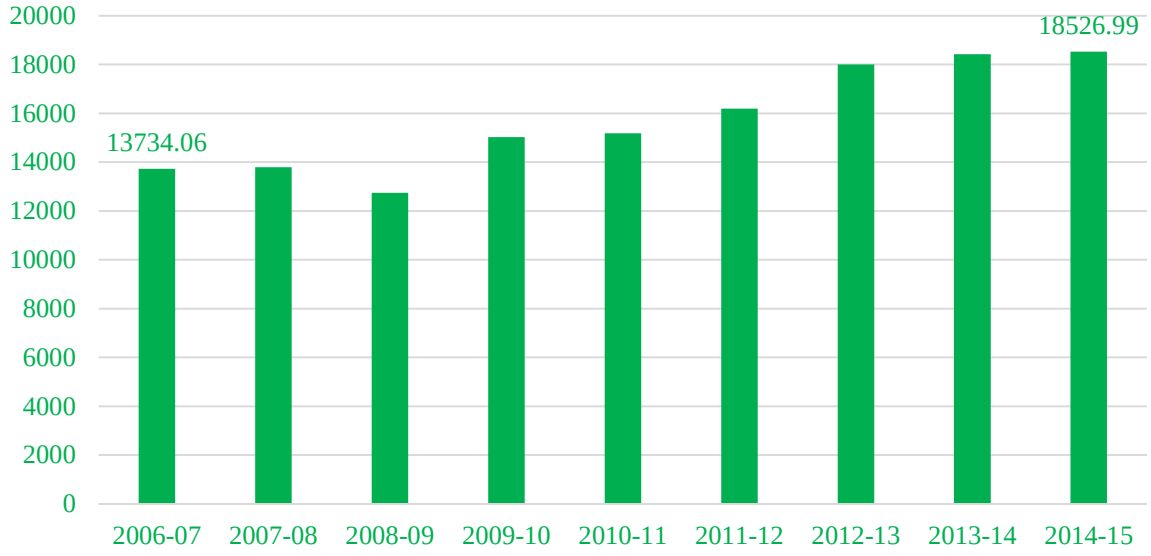
Globally, India is the largest producer of fresh mango and mango pulp in the world, followed by China, Thailand and Egypt. In 2013, the total world production of fresh mango was approximately 43 million MT, and India's share in world production was nearly 40 per cent. In the same year, the world production of mango pulp was nearly 1.5 million MT, out of which India's share was 62 per cent. India's production of fresh mango and mango pulp has increased over the past decade.[35]

[33] Aseptic processing is the process by which a sterile (aseptic) product (typically food or pharmaceutical) is packaged in a sterile container in a way that maintains sterility.

[34] Source: http://apeda.gov.in/apedawebsite/SubHead_Products/Mango_Pulp.htm (accessed on 27 October, 2016)

[35] Source: FAOSTAT.

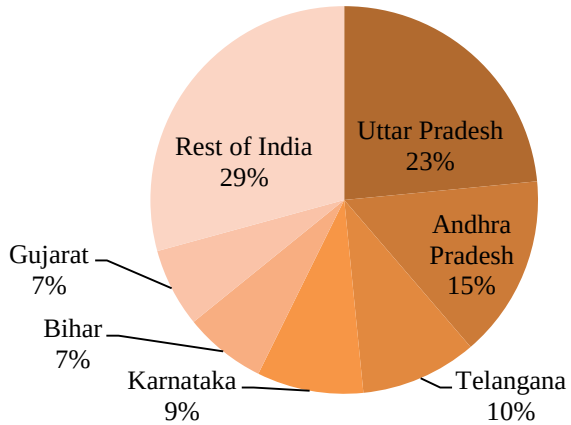
Figure 3.1: Mango Production in India (in 1000 metric tons (MT)



Source: APEDA. Available at http://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?cat=fruit&hscode=1050 (accessed on 27 October, 2016)

In India, the major mango producing states are Uttar Pradesh, Andhra Pradesh, Karnataka, Gujarat and Bihar. There are two main clusters in India for mango pulp production which are located in Chittoor in the state of Andhra Pradesh and Krishnagiri in the state of Tamil Nadu. Some of the processing units are located in the states of Maharashtra and Gujarat.[36] The share of various states in the production of mango is given in Figure 3.2. In 2014-15, Uttar Pradesh, Andhra Pradesh and Telangana together accounted for nearly 50 per cent of total mango production in the country.

Figure 3.2: Share of Various States in Mango Production (2014-15)



Source: APEDA database, available at http://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?cat=fruit&hscode=1050 (accessed on 27 October, 2016)

[36] Source: http://apeda.gov.in/apedawebsite/SubHead_Products/Mango_Pulp.htm (accessed on 27 October, 2016)

3.2 Export of Fresh Mango and Mango Pulp from India

India and China, despite being the largest producers of mangoes in the world, produce primarily for their own domestic markets. India mainly exports mangoes in two forms – fresh mango (HS Code: 08045020) and mango pulp (HS Code: 08045040). India exports a larger quantity of mango pulp compared to fresh mango. In 2014-15, India exported only 2 per cent of the fresh mango that was produced, but exported nearly 80 per cent of mango pulp that was processed in the country.[37]

The EU is not a major producer of fresh mango and its consumption of fresh mango in the past was not very high. However, since 2012, its consumption of fresh mango has increased.[38] Important varieties of mango consumed in the EU include Keitt, Kent, Tommy Atkins, Osteen (grown in the EU) and Palmer. The Keitt and Kent varieties are largely exported to the EU from Brazil. The leading countries exporting fresh mangoes to the EU are Brazil (37 per cent of all extra-EU imports), Peru (27 per cent) and Ivory Coast (7.6 per cent). Within the EU, the Netherlands, Spain and Belgium are the leading export hubs for fresh mangoes. The Netherlands re-exports mangoes primarily to Germany, France and the UK and Spain exports to Portugal and France.[39]

The EU is also the second largest regional market for mango pulp after the Arabian Peninsula. EU is estimated to import 20 per cent of the world's total imports of mango pulp and imports are increasing. The largest user of mango pulp in the EU is the fruit juice industry, but it is also used in other segments, such as ice cream, baked goods and baby foods. India is the largest supplier of mango pulp to the EU, followed by Thailand, Mexico and Brazil. The share of Brazilian mango pulps in the EU's imports has been rising over the past few years.[40]

Indian varieties of fresh mangoes are mainly preferred by non-resident Indians (NRIs) and South Asian customers in the EU. Within the EU, the major countries importing fresh mango from India include the UK, France, Germany and Italy. Major EU member states importing mango pulp from India include the Netherlands, Spain and Portugal.[41]

India's export of fresh mango to the world has been falling steadily from 63,441.29 MT in 2011-12 to 36,329.01 MT in 2015-16.[42] Further, India's export of fresh mango to the EU has fallen from 3,890.31 MT in 2012-13 to 1,668.21 MT, due to a fall in exports to the UK, France and Italy. The export of mango pulp to the EU fell from 44,486.17 MT in 2013-14 to 23,077.26

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37 Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx (accessed on 7 November, 2016)

38 Source: https://www.cbi.eu/sites/default/files/market_information/researches/product-factsheet-europe-fresh-mangoes-2015.pdf (accessed on 7 November, 2016)

39 Source: https://www.cbi.eu/sites/default/files/market_information/researches/product-factsheet-europe-fresh-mangoes-2015.pdf (accessed on 7 November, 2016)

40 Source: https://www.cbi.eu/sites/default/files/market_information/researches/product-factsheet-europe-mango-puree-2015.pdf (accessed on 2 November, 2016)

41 Source: APEDA (accessed on 27 October, 2016)

42 Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 27 October, 2016)

MT in 2015-16 due to a fall in demand from the Netherlands and Finland.[43] Table 3.2 and 3.3 also show that the export of fresh mango and mango pulp to other markets such as Saudi Arabia has also been falling.

Table 3.2 and 3.3 depicts the top importing countries of India's fresh mango and mango pulp respectively.

Table 3.1: Top Importers of Fresh Mango from India

Country	Qty. 2012-13 (MT)	Qty. 2013-14 (MT)	Qty. 2014-15 (MT)	Qty. 2015-16 (MT)
UAE	37598.64	23046.65	29231.9	19973.6
Nepal	2237.62	1106.44	3574.93	8273.99
UK	3304.48	3381.08	329.81	1496.28
Saudi Arabia	1665.43	1721.91	2171.49	1399.08
Qatar	1522.89	770.08	998.1	1016.25
Kuwait	828.16	4601.44	787.28	748.35
Bahrain	497.49	634.54	658.71	747.79
Singapore	650.27	545.95	562.95	579.96
Canada	437.88	459.49	669.26	459.34
Oman	353.45	345.3	605.2	426.84
USA	242.2	242.42	271.79	266.45
Malaysia	223.35	226.14	202.31	169.76
Japan	0	0.02	4.85	152.98

Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 27 October, 2016)

Table 3.2: Top Importers of Mango Pulp from India

Country	Qty. 2012-13 (MT)	Qty. 2013-14 (MT)	Qty. 2014-15 (MT)	Qty. 2015-16 (MT)
Saudi Arabia	43447.95	44390.28	47178.1	42055.43
Netherlands	11236.2	14228.56	12018.46	12004.53
Yemen Republic	25202.64	37175.2	26179.82	10793.77
Kuwait	4760.74	2921.47	8696.23	8891.61
UAE	11737.42	9096.73	9822.37	8496.68
USA	3783.81	3605.17	4204.9	4503.87
UK	3198.55	3323.64	4882.71	4870.16
Sudan	6304.53	6317.9	6192.2	6155.16
Germany	1559.15	24248.64	1830.31	2979.96
China	2875.81	3371.07	4105.69	2736.76
Egypt	3617.26	943.22	1779	2240.82
Canada	2708.02	1953.46	2858.51	1728.29
Iran	1631.98	988.4	819	1687.2

Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 27 October, 2016)

[43] Source: APEDA (accessed on 27 October, 2016)

3.3 The Fresh Mango and Mango Pulp Supply Chains

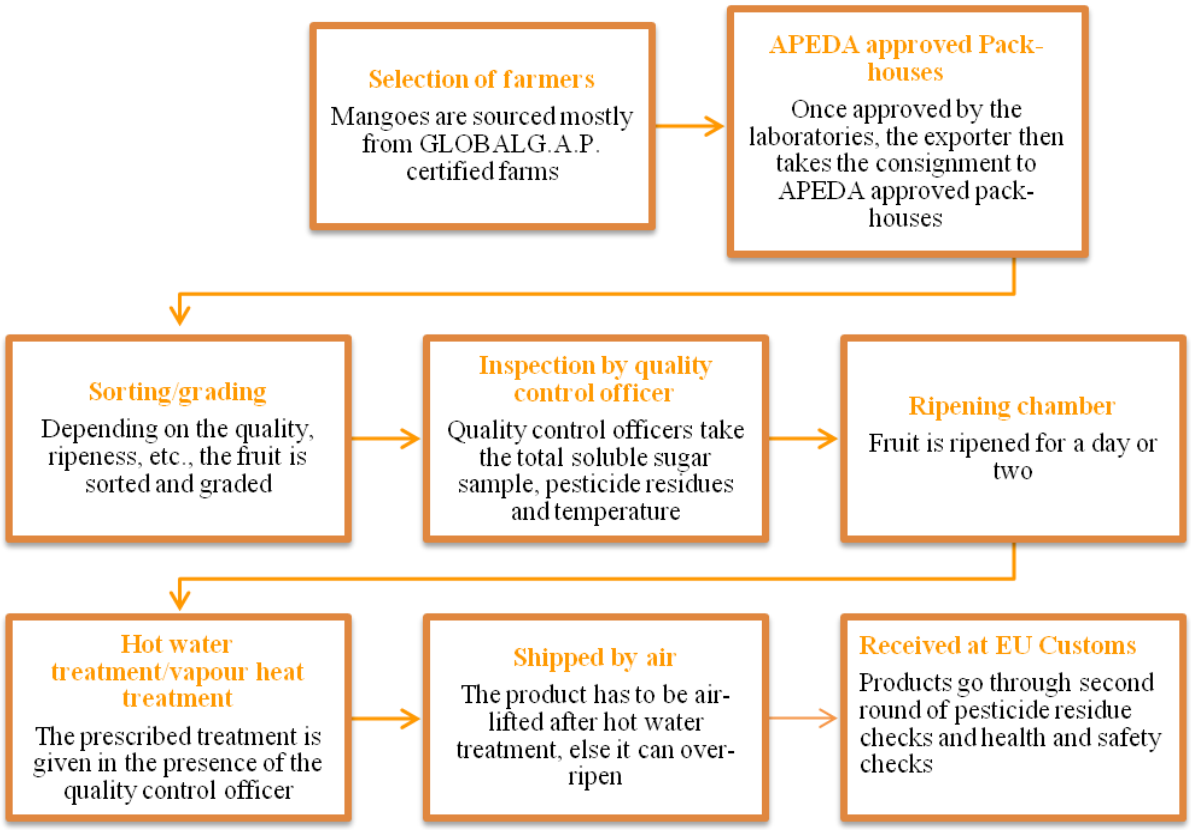
The supply chain for fresh mangoes is illustrated below. It is important to note that APEDA has set up a traceability system for exports of fresh mangoes to the EU. Due to the presence of fruit flies in mangoes, exports of fresh mangoes from India have to meet the requirements of importing countries. For example, in the case of the US, there is gamma irradiation treatment, while the EU requires hot water treatment or vapour heat treatment at a certain prescribed temperature. The facilities for such treatments are available in the country. For example, after APEDA made it mandatory to give hot water treatment to mangoes, it was made available at two existing facilities at Ratnagiri and Sindhudurg in the Konkan region of Maharashtra. Further, APEDA also sanctioned a new INR 28 million facility in Mumbai, which was established by the MSAMB in Vasi, Navi Mumbai.[44]

When fresh mangoes are exported to the EU market, the export process has to follow certain requirements (see Figure 3.3). First, the mangoes are sourced only from GLOBALG.A.P. certified farmers. The exporter then takes the consignment to APEDA approved facilities and, after sorting and grading, the product is again inspected where tests are carried out to check the sugar content and pesticide residues, along with other quality inspections. After ripening, the product is given either hot water treatment or vapour heat treatment. It is worth mentioning here that these tests are done both in India and again at the EU port of entry. It was pointed out during the survey that often the testing procedures in India and the EU are different and can yield different results. This creates a problem for exporters.

It was also pointed out that most EU consumers (unless NRIs) are indifferent to the taste of mangoes originating from South Africa or Brazil or India. The Asian population has a preference for Indian mangoes. Hence, Indian mangoes are largely sold in grocery stores run by Asians or those that keep indigenous Asian products. It is the retail outlets that pick up the products depending on their quality, which is judged by the physical attributes of the products, namely its size and colour.

[44] See http://www.financialexpress.com/markets/commodities/mangoes-to-run-under-hot-water-before-export-to-eu/33890/ (accessed on 4 November, 2016)

Figure 3.1: Supply Chain of Fresh Mangoes for Export to the EU

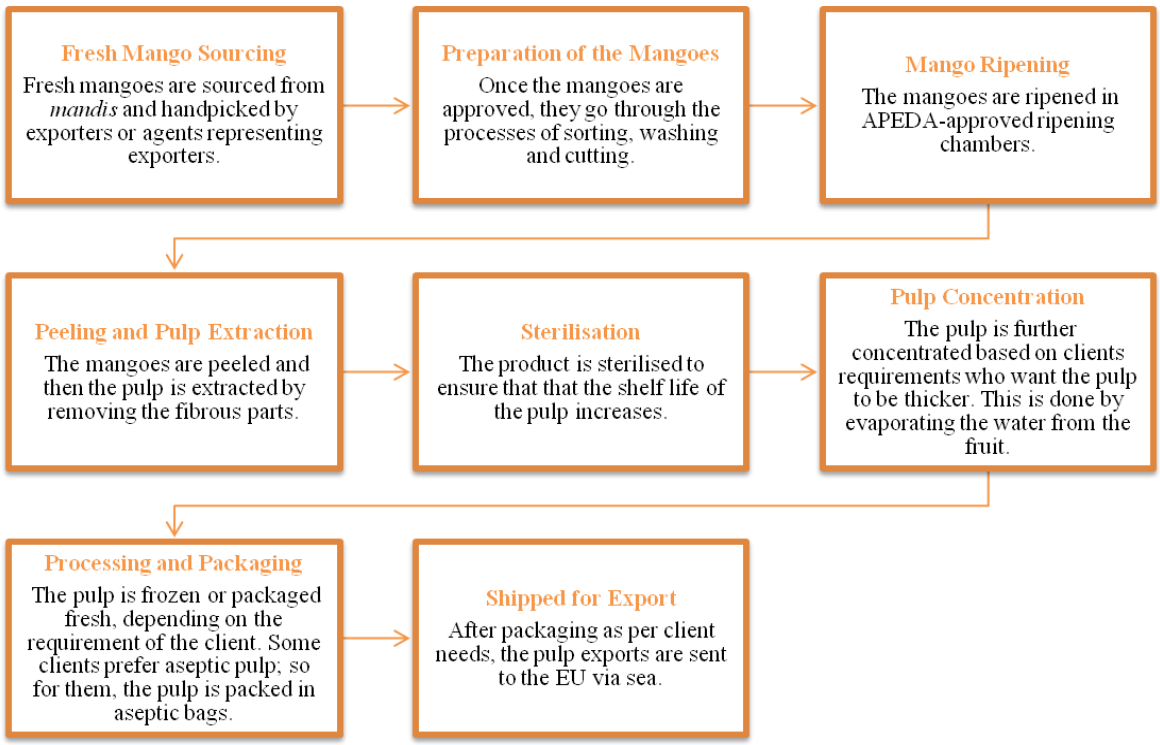


Source: Based on inputs received during the survey

The supply of mango pulp follows a client-driven format. For mango pulp, the mangoes are sourced from the *mandis*[45] and they are processed (tinned, frozen etc.) as per the requirements of European clients. Most of the clients are European processors/manufacturers. The supply chain of mango pulp is given in Figure 3.4.

[45] Mandis are large, unorganised marketplaces, popular in South Asia, where farmers sell their produce (such as fruits and vegetables) to various middlemen (such as exporters, processors, etc.).

Figure 3.2: Supply Chain of Mango Pulp for Export to the EU



Source: Based on inputs received during the survey

3.4 The Survey and SPS Issues Faced

For this case study, 30 exporters and 12 mango farmers were interviewed across Maharashtra and Gujarat. Out of the 30 exporters, 21 were engaged in the export business while 9 were exporters-cum-processors. Three cold chain players and pack house service providers, who were also exporters, were also interviewed. Seventeen exporters exported fresh mangoes, whereas 8 exported mango pulp and 5 exported both fresh mangoes and mango pulp.

Most of the exporters interviewed faced issues regarding pests in the shipment, damage inflicted upon the product (especially Alphonso mango) due to the hot water treatment and fall in revenue due to the ban on mango imports from India. It is important to note that there are no issues related to MRLs in mangoes, either fresh or pulp. The key issue for fresh mango is fruit fly infestation while that for pulp is the sugar content in mangoes, which can be a barrier in the future. Some issues faced by exporters are given below in detail.

3.4.1 The Case of Fruit Flies in Fresh Mangoes

In May 2014, the EU banned exports of fresh mangoes from India due to the presence of fruit flies in incoming consignments.[46] It is worth noting that India has been exporting mangoes to

[46] In the EU, interceptions related to plant health are reported under the European Union Notification System for Plant Health Interceptions, called the EUROPHYT. It is a web-based network that aims to protect the territory of the EU from the introduction and spread of new pests and plant diseases that may get carried

the EU for a long time and the EU has raised concerns about fruit flies through the EUROPHYT portal. However, as shown in the Table 3.4, in spite of repeated alerts raised by the EU, cases of fruit fly infested consignments continued, which led to the ban.

The EC conducted audits in the year 2013 to check the continued interceptions of harmful organisms in consignments of mango exported from India to the EU, as well as non-compliant wood packaging material (WPM). The audits had taken place to assess the system of phytosanitary tests and regulations that were in place in India for the export of mangoes and other horticultural products (such as eggplant). The audit showed a significant lack of compliance to phytosanitary health standards imposed by the EU and the presence of fruit flies in mango shipments being exported to the EU.[47] In this context, it is worth mentioning that APEDA conducted a review of the cases before 2010, after which there was a fall in the number of interceptions. However, since no major step was taken, the number of cases again increased after 2010.

Table 3.1: Number of Interceptions in the Case of Mangoes from the EU

Year	Number of Interceptions
2005	2
2006	1
2007	13
2008	10
2009	17
2010	8
2011	22
2012	18
2013	37
2014 (The Year of the Ban, in May)	4
2015	5

Source: Compiled by authors from the EUROPHYT database (http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/interceptions/index_en.htm) (accessed on 3 October, 2016)

In total, there were 137 interceptions from 2005 to 2015. Most of the cases were for different varieties of fruit flies (such as Tephritidae, *Bactrocera Zonata* and *Bactrocera dorsalis*). In India, plant health comes under the Directorate of Plant Protection, Quarantine and Storage under the Ministry of Agriculture & Farmers Welfare. While the Directorate of Plant Protection, Quarantine and Storage actively follows the EUROPHYT website and APEDA has regular meetings with exporters, no remedial action was taken to prevent fruit fly infestation during the period since 2011, which led to the ban.

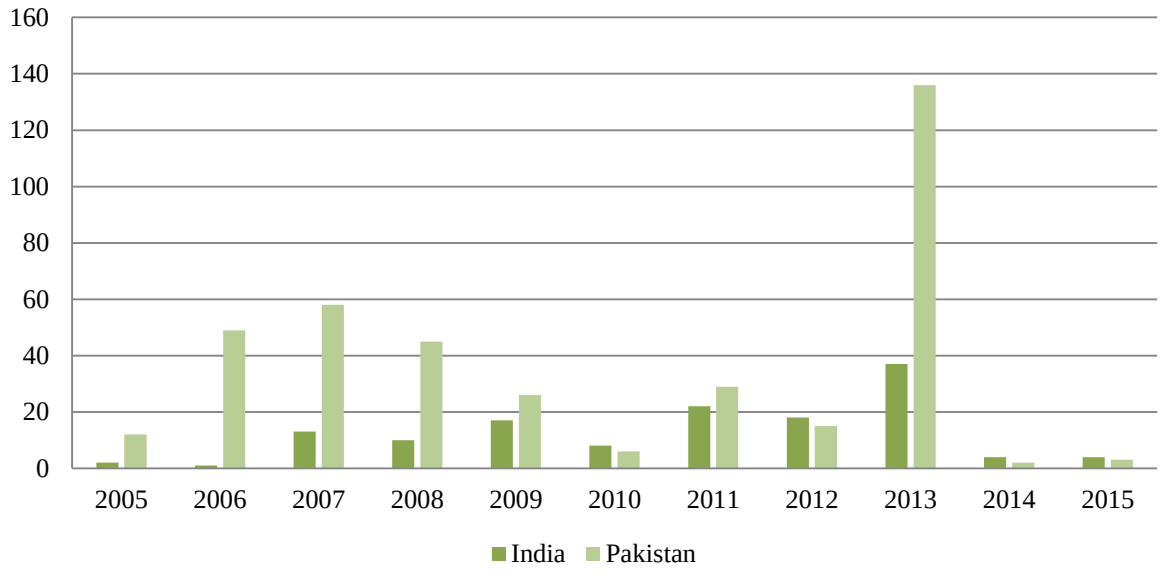
The issue of hatching of flies in fruits and vegetables is not unique to India. Other countries such as Pakistan also face the issue of fruit flies in mangoes. Pakistan has faced 382

into the EU market through export consignments from other countries. To avoid the export of such pests and diseases, consignments are tested at the port and in the case of a threat, a notification is raised to the exporting countries. For details see http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt_en (accessed on 25 October, 2016).

47 Source: ec.europa.eu/food/fvo/act_getPDF.cfm?PDF_ID=10719 (accessed on 7 November, 2016)

notifications in total between 2005 and 2015 on the EUROPHYT portal. Figure 3.5 compares the interceptions for India and Pakistan.

Figure 3.1: Interceptions Raised by the EU for India and Pakistan



Source: Compiled by authors from the EUROPHYT database (http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/interceptions/index_en.htm) (accessed on 7 November, 2016)

As shown in Figure 3.5, in some of the years, Pakistan has had a much higher number of interceptions for pests than India. In 2013, interceptions faced by mango exported from Pakistan were more than three times that faced by exports from India (Pakistan: 136 interceptions; India: 37 interceptions). In 2014, the EU banned imports of mangoes from India, but no such ban was imposed on exports from Pakistan. This is because when the EC sent a warning letter to Pakistan, it stopped exporting mangoes, introduced new hot water treatment plants[48] and made the hot water treatment mandatory for exports.[49] It is also worth noting that in 2013, India exported approximately 4,000 MT of fresh mangoes to the EU[50], whereas Pakistan exported approximately 12,000 MT.[51]

The survey participants pointed out that the ban on import of fresh mangoes from India despite the lower number of interceptions highlights the non-transparency in the EC system. They also presented their own views on what may have led to this situation. One view is that Pakistan

48 Source: http://nation.com.pk/business/15-Jul-2014/govt-introduces-hot-water-treatment-plants-for-mangoes(accessed on 3 March 2017)

49 Source: http://gulftoday.ae/portal/53d50e1d-0801-4bb5-9ab5-dfaac9945cc6.aspx (accessed on 3 March 2017)

50 Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 7 November, 2016)

51 Source: Pakistan Bureau of Statistics, Government of Pakistan. Available at http://www.pbs.gov.pk/trade-tables (accessed on 4 November, 2016)

policymakers, unlike Indian policymakers, lobby hard with countries such as the UK to facilitate their exports.

One way of controlling the growth of pests and fruit flies is by spraying pesticides. However, most developed countries have strict MRLs. Therefore, some exporting countries use in-farm practices such as netting wherein each product is protected from flies by covering it with a fruit net/bag (see Image 3.1). This technique is costly and farmers are often reluctant to adopt these methods. The other alternative is to subject the fruit to post-harvest treatment such as hot water treatment, which is now followed in countries such as India and South America.

Image 3.1: The Process of Netting/Bagging Mangoes to Protect them from Fruit Flies

Source: The image has been taken from http://www.thedailystar.net/country/eco-friendly-bagging-method-save-mangoes-pests-84862 (accessed on 25 October, 2016)

One of the key barriers that exporters face is that different countries that import fresh mangoes from India have set up different remedies for treating fruit flies. While the US prescribes that the fruit should undergo gamma irradiation, in the EU, hot water treatment is prescribed (immerse the fruit for 60 minutes in water heated at 48 degrees Celsius). After the ban in May 2014, based on a discussion with the EU authorities, the Directorate of Plant Protection, Quarantine and Storage, the Ministry of Agriculture & Farmers Welfare and APEDA issued an advisory in March 2015 to Indian mango exporters to adopt one of the following measures for consignments meant for the EU market:[52]

[52] For details see http://apeda.gov.in/apedawebsite/Announcements/EUMango.pdf (accessed on 26 October, 2016)

1. Hot water immersion treatment at 48 degree Celsius for 60 minutes (fruit size up to 500 grams)
2. Vapour heat treatment either at 46.5 degree Celsius for 30 minutes or 47.5 degree Celsius for 20 minutes.

The survey participants argued that these prescriptions are based on research conducted on South American mangoes. Compared to varieties such as Tommy Atkins and Keitt from South America, which have a thick skin, Indian Alphonso and Kesar that are exported to the EU have thinner skin and the fruit, according to them, is not able to withstand the hot water treatment. The participants also pointed out that the prescribed temperature and time duration for hot water treatment may be fit for a particular variety of mango (for example, Alphonso grown in Karnataka can withstand it); however, it is not suitable for the variety grown in Maharashtra. Further, it depends on the stage of ripening at which the mango is plucked and treated. If the mango is ripe, it will not be able to withstand the treatment. The meetings with APEDA and experts show that for a long time, APEDA had been proposing the hot water treatment, but exporters raised concerns about accepting the treatment until the EU imposed a ban. APEDA requested the MSAMB to conduct a study to assess the appropriate procedure for hot water treatment that would ensure minimum spoilage of the fruit. This was commissioned to Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (Agricultural University) in Dapoli, Ratnagiri. However, the study result was not available on the public domain until November 2016. Representatives from the survey team visited the university to request a copy of the report, but the scientists said that they were not authorised to release it.

Exporters gave various opinions about the study outcome and the APEDA approved process for treatment of fresh mangoes for the EU market. While some said that they have no issues and are able to abide by the procedures laid down by APEDA, others pointed out that their whole consignment was destroyed as the hot water treatment damaged the skin of the mangoes. Others had interesting stories on how they eradicated fruit flies without exposing the fruit to excess heat and water. One such exporter conducted the treatment by immersing the fruit for 50 minutes at 47.5 degree Celsius or one hour immersion at 46.5 degrees, which was suitable for these varieties. They said that the pests were killed successfully without inflicting major damage to the fruit. It is interesting to note that he managed that under strict monitoring by the Directorate of Plant Protection, Quarantine and Storage. Another exporter pointed out that he first cooled the mangoes to its minimum approved temperature and then put them in hot water. Some exporters purchase the mangoes when they are 20-30 per cent ripe and then perform the hot water treatment to avoid any spoilage. In any case, all exporters maintained that due to the hot water treatment, mangoes have to be transported by air to the EU and it affects their shelf life.

Three exporters also raised the issue of where gamma irradiation and hot water treatment should be done – in India or at the port of destination. For example, Pakistan does not have a gamma irradiation facility and the treatment is done in the US port of entry. However, APEDA and most of the exporters feel that the treatment should be in India.

As illustrated in the fresh mango supply chain, mangoes meant for the EU market have to go through several rounds of inspection and treatments. They undergo laboratory testing in the EU port of entry as well. The hot water treatment, quick freezing, poor supply chain and transportation delays can all have adverse implications for the shelf life of the product and the cost of multiple testing and transportation by air is also high. The exporters also referred to the issues that they have to face due to compliance with different SPS requirements of different countries.

3.4.2 Wider Challenges that affect Compliance with the EU SPS measures

There are certain other challenges which make it difficult to comply with the EU's SPS measures or the solution imposed to address the EU's SPS measures. For example, a number of exporters pointed out that compared to Indian Alphonso mangoes which have thin skin, mangoes from South America have a thicker skin and a longer shelf life. Therefore, they are able to sustain treatment like hot water treatment without getting spoilt unlike Indian mangoes. To counter this concern of the exporters, it is important for the Department of Commerce to make public the scientific study showcasing that hot water treatment is not harmful for Indian Alphonso mangoes. This will remove all concerns and controversies.

There are certain infrastructural bottlenecks that act as a challenge to comply with the requirements of the SPS measures and it escalate the costs for the farmers and exporters. For example, there are limited APEDA approved facilities for sorting, grading and laboratory testing; and they are also not uniformly spread across different states. Gujarat state government officials pointed out that for hot water or vapour treatment, an exporter from Gujarat has to take the product to Maharashtra as the facility is not available in Gujarat. Similarly, gamma irradiation facilities are located only in a few states. All this adds to the spoilage and cost incurred by exporters.

Moreover, to comply with requirements to address the fruit flies infestation issue, all post-harvest activities are to be done in APEDA approved facilities. Getting the approval for a facility also involves time and cost. It takes about 3-5 months on an average to obtain a licence for sorting, grading and testing facilities while the hot water treatment plant takes about 2 and a half months. Further, while the cost of obtaining the licence is around INR 50,000, often the facilities have to be re-constructed to suit EU requirements. The cost of setting up the required infrastructure sometimes comes to INR 50-100 million.

3.4.3 Sugar Content in Mango Pulp: A Potential SPS Barrier

Secondary data as well as the survey revealed that in the past few years, the export of mango pulp from India to the EU has been falling and the EU has shifted the demand to mango pulp coming in from Brazil, Peru and Mexico.[53] This is due to the fact that mango pulp imported from India has a higher sugar concentrate than those imported from South America. Sugar content in mango pulp can be a food safety issue if limits are set based on health concerns in

[53] Source: https://www.cbi.eu/sites/default/files/market_information/researches/product-factsheet-europe-mango-puree-2015.pdf (accessed on 7 November, 2016)

the EU. The sugar in mango pulp used in fruit juices contains fructose, which causes obesity and type-2 diabetes. The sugar content per portion is higher in juices than in whole fruits.[54] Many countries have also introduced a tax on sugar-based beverages such as carbonated drinks, energy drinks, etc., to discourage consumption. Such a tax is imposed on a beverage if its sugar content exceeds the prescribed limit. A number of EU member countries are discussing sugar tax and buyers are specifying sugar limits which act as a barrier for Indian exporters. Although this has not been raised as an SPS issue now, it will be an issue in the near future and therefore, it is important to have a proactive strategy rather than reactive strategy and investigate how to address this issues as was pointed out that the exporters and state government officials.

Fruit juice consumption in the EU is the highest in the UK, but consumption has been decreasing over the past 2-3 years.[55] The survey revealed that EU importers have shifted their main sourcing from India to South American countries because the sugar content in pulp from those countries is lower. They have also imposed strict requirements on sugar levels in the pulp. However, the sugar in mango pulp processed in India consists of natural sugars, not artificially added sugars, and there is hardly anything that the processors can do to decrease the content. This issue has to be addressed at the field level with the right variety of crop.

3.5 The Way Forward

The above case study highlight that key issue faced by mango exporters is fruit flies infestation. The attack of pest on crops not only leads to export bans, loss of export revenue but also loss of revenue to farmers due to crop losses. This issue can be more permanently addressed through in-farm practices such as netting, growing crops in a controlled environment like poly houses and post-harvest practices such as hot water treatment. India may continue with the present policy of hot water treatment in the short run, even though some exporters feel that it can impact the quality adversely. In the long run, India may explore alternative farming practices which are discussed in this chapter. Through the EU technical assistance programme, training programme can be organised for farmer groups about methods like netting/bagging and they may be encouraged to adopt these to protect their crop. There is scope of collaboration with the EU for agricultural extension programmes and research on different methods of preventing fruit fly infestation.

It was pointed out during the survey that there should be more research on alternative method to address the concerns related to fruit flies. There is need for research to explore methods such as phosphine gas treatment given to the fruit to prevent hatching of fruit flies. However, without proper research on whether such treatment is suitable for the Indian variety of mangoes no measures should be adopted and the research should be first made available in public domain before adopting the measure.

Further, the survey showed that it is important for APEDA to publish research findings such as the study done by Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth Agriculture University

[54] Source: http://aijn.org/files/default/aijn2014-full.pdf (accessed on 3 November, 2016)
[55] Source: http://aijn.org/files/default/aijn2014-full.pdf (accessed on 3 November, 2016)

in Dapoli, Ratnagiri on hot water treatment. The study may be made available in public domain. In the case of exports of okra to the EU, both APEDA and the Directorate of Plant Protection, Quarantine and Storage had taken the right decision to stop exports of pest-infected produce. A similar strategy should be followed by APEDA for key export items like mangoes.

There are several studies conducted on pests that infect Indian mangoes and measures that can be taken to eliminate them. One particular study identifies various breeds of flies and other pests that are persistent in the Western Ghats. The study lists the characteristics and physical attributes of pests that are recognised to enable farmers identify them and take appropriate measures (Drew, *et al*., 2002). Another study by the Indian Council of Agricultural Research (ICAR) has been published, which lays down the guidelines on the proper management of pests and care of mangoes (ICAR, 2012). Such studies should be used to train exporters and farmers.

There is need to generate awareness through training of Indian customs officers so that the product is not unnecessarily held up at the customs, causing delays and financial losses.

It was pointed out during the survey that hatching of flies is not just conditional on the outside environment and fruit health but also the kind of packaging used for the product. Hence, there is need to develop good quality packaging material. India can take technical advice and expertise from the EU for developing the right kind of packaging to prevent the proliferation of fruit flies, especially when the goods are in transit.

Chapter 4: The Case of Export of Indian Table Grapes to the EU

In April 2010, containers of Indian table grapes were detained at various EU member countries' ports on grounds that these grapes contained more than the permissible quantity of chlormequat chloride (ccc) also known as chlorocholine chloride, a chemical, which is hazardous to health. This resulted in huge losses to Indian exporters and farmers. However, this incident did not stop the export of table grapes from India to the EU in subsequent years. In 2015-16, export of table grapes from India touched an all-time high – India exported 84,482 tonnes of grapes to EU compared to 41,783 tonnes exported in the previous year, registering a growth of 102 per cent.[56] Today, India is a large exporter of grapes to the EU. The journey from rejection to a tremendous growth in exports was possible through the joint efforts of the Indian central and state governments' agriculture and horticulture departments, the agriculture marketing boards, APEDA, exporters and farmers. While the success stories of farmers co-operatives such as Mahagrapes in the export of grapes is well documented, the overall story of grape exports from India is presented here.

Thompson Seedless Grapes

At the outset, it is worth mentioning that there are three broad categories of fresh and processed grapes (excluding wine) traded as per the harmonised system (HS) of classification – fresh grapes (HS 08061000), sultanas and other dried grapes (HS 08062090) and other grape fruit juice (HS 20092900.)[57] Of this, India's trade with the world and the EU in sultanas and grape fruit juice is negligible. Therefore, this chapter focuses on fresh grapes (or table grapes).

This case study is based on an analysis of secondary information and a primary survey conducted in the major grape exporting states of India, namely Maharashtra and Gujarat, covering cities such as Ahmedabad, Pune, Nasik, and Mumbai. In total, 28 interviews were held, which included 16 exporters and grower exporters and 12 grape farmers. There were also interactions with state government departments, trade and export promotion bodies such as APEDA and the Maratha Chambers of Commerce, Grapes Exporters Association of India, Maharashtra Rajya Draksha Bagaitdar Sangh (Maharashtra State Grape Growers Association).

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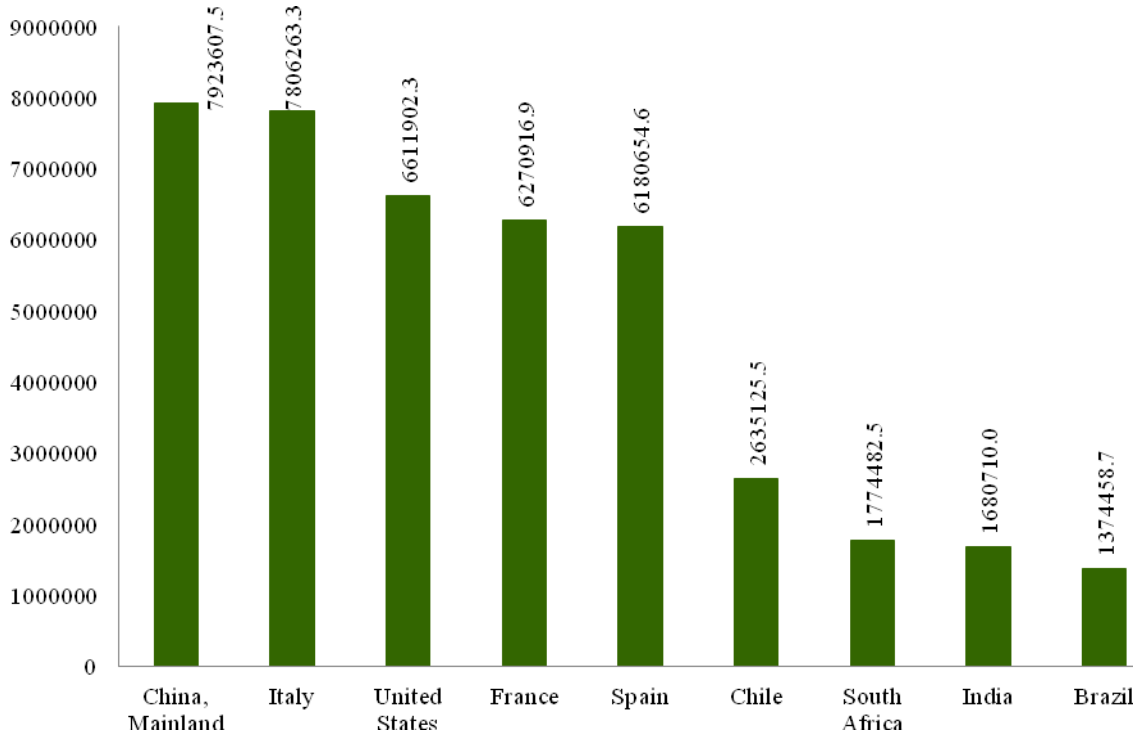
[56] For details see http://economictimes.indiatimes.com/articleshow/52215590.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst (accessed on 23 August, 2016).

[57] See Chapter 2 for details of India's export to the EU.

4.1 Overview of the Table Grape Industry in India

In India, grapes were cultivated over an area of 118,000 hectares in 2014 with an annual production of more than 1,000,000 tonnes.[58] Compared to other grape producing countries, India still lags behind in terms of its average production; however, due to favourable agricultural conditions, it is one of the top countries in terms of the average yield of grapes. China is the largest producers of grapes in the world followed by Italy, the US, France and Spain (See Figure 4.1).

Figure 4.1: Average Production of Grapes in 2004-14 for Selected Countries (in MT)



Source: Compiled by Authors from Statistics provided by the Food and Agriculture Organization of the United Nations, accessible at http://faostat3.fao.org/browse/Q//E (accessed on 20 August, 2016)*

As regards yield, with a yield of 21088.21 kilogram per hectare, India ranked second after Egypt in terms of the average yield between 2004 and 2014. This highlights India's potential as an exporter of grape in the world market.

India specialises in the production of colourless varieties of grapes. These include the white seeded variety and the white seedless variety, which account for 70 per cent of commercially grown grapes in India. Among these, Thompson Seedless and its clones Tas-A-Ganesh, Sonaka and Manik Chaman occupy 55 per cent of the total production area, followed by Anab-e-Shahi and its clone (15 per cent). Certain coloured varieties are also grown in India which seeded varieties such as Bangalore Blue and Gulabi (Muscat). The coloured seedless varieties are

[58] http://www.fao.org/docrep/003/x6897e/x6897e06.htm (accessed on 12 April, 2016)

Beauty seedless, Flame seedless (red seedless) and Sharad seedless (black seedless).[59] Among the grape producing states in India, Maharashtra has an 82.5 per cent share in the total production of grapes, followed by Tamil Nadu, Karnataka and Andhra Pradesh.

In 2014, the global trade in grapes was around 45.9 million tonnes, valued at approximately USD1.0015 billion. Out of this, India had exported 1.38 million tonnes, valued at USD 264,669 (a percentage share of 2.64 per cent)[60] to major exporting destinations such as the Netherlands, Russia, the UK, the UAE and Saudi Arabia.[61] Table 4.1 shows the top 10 countries (2015-2016) and top 10 EU member states (2014-2015) importing India's table grapes. Over 60 per cent of India's total export of table grapes is to the EU.[62]

Table 4.1: Top 10 Global Countries and the EU Member States Importing India's Table Grapes in 2015-2016

S. No.	Country	Quantity (MT)	Value (INR Million)	Value (EUR[63] Million)
Top Global Countries Importing India's Grapes				
1.	The Netherlands	50,702.44	5881.46	81.41
2.	UK	18,014.68	2087.79	28.90
3.	Russia	13,804.66	1367.30	18.92
4.	UAE	13,075.43	1166.10	16.14
5.	Saudi Arabia	8,140.47	694.04	9.60
6.	Germany	5,143.99	549.14	7.60
7.	Thailand	3,193.77	404.19	5.59
8.	Sri Lanka	3,139.82	321.12	4.44
9.	Ukraine	3,358.39	223.43	3.09
10.	Finland	1,574.50	201.30	2.79
Top EU Member state Importing India's Table Grapes				
1.	Netherland	50,702.44	5881.46	81.41
2.	U K	18,014.68	2087.79	28.90
3.	Germany	5,143.99	549.14	7.60
4.	Finland	1,574.50	201.30	2.79
5.	Lithuania	1,905.07	171.01	2.37
6.	Sweden	1,282.16	148.51	2.06
7.	Poland	1,703.73	123.36	1.71
8.	Romania	1,099.64	90.99	1.26
9.	Denmark	599.94	72.64	1.01
10.	Croatia	774	55.21	0.76

59 Compiled from http://apeda.gov.in/apedawebsite/SubHead_Products/Grapes.htm (accessed on 20 August, 2016)

60 http://agriexchange.apeda.gov.in/product_profile/india_standing.aspx?categorycode=0205 (accessed on 12 April, 2016)

61 http://apeda.gov.in/apedawebsite/SubHead_Products/Grapes.htm (accessed on 12 April, 2016)

62 See Chapter 2 for details.

63 Conversion from INR to EUR done using the average exchange rate for the financial year 2015-2016 from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; (accessed on 12 April, 2016) EUR 1 = INR 72.244725

Source: *http://agriexchange.apeda.gov.in/product_profile/exp_f_india.aspx?categorycode=0205 (accessed on 12 April, 2016)*

The table above indicates that the EU is a key importer of Indian grapes. According to the data published by the DGFT, Ministry of Commerce and Industry, in 2014-15, the share of the EU in the total export of grapes from India was around 61 per cent. The export of grapes from India to the EU doubled in 2016, as compared to 2015. In 2015, 41783 metric tons (MT) (3288 containers) of grapes were sent to the EU while in 2016, the number increased to 84495.4 MT (6471 containers). Maharashtra accounted for a major portion of these exports.[64]

As regards the major importing countries in the EU, Table 4.2 shows that the Netherlands, the UK and Germany are the top three destinations, accounting for 88 per cent of the total grapes exported to the EU in the year 2015-16.

Table 4.2: Export of Table Grapes from India to EU Member States in 2015-16

Country	Qty. (In MT)	No. of Containers
Netherlands	48773.261	3723
United Kingdom	18319.525	1412
Germany	7537.195	579
Finland	1866.4	157
Belgium	1389.15	111
Sweden	1319.302	104
Denmark	1104.28	88
Norway	958	82
Ireland	829.542	53
Lithuania	811.413	50
Switzerland	327.36	27
Latvia	278.706	17
France	198.87	14
Austria	145.436	11
Czech Republic	145.212	11
Italy	132	9
Poland	118.773	8
Romania	100.368	6
Estonia	81.039	5
Slovenia	48.024	3
Luxembourg	11.5	1
Total	**84495.356**	**6471**

Source: Daily MIS Report for Export of Grapes available at the GrapeNet system of APEDA accessible at http://www.apeda.gov.in/apedawebsite/Grapenet/GrapeNet_new.htm (accessed on 26 August, 2016). Please note: There is slight discrepancy in the data provided in Table 4.1 and 4.2 as the data sources are different.

[64] This is taken from the Daily Management Information System report generated by GrapeNet and uploaded on their websites. These figures were accessed from http://www.apeda.gov.in/apedawebsite/Grapenet/GrapeNet_new.htm (accessed on 26 August, 2016). The figures are updated from time to time.

As mentioned earlier, in India, the most prominent variety of the export is Thomson Seedless, which is the white/colourless variety. Among the 12 farmers who were interviewed, 9 cultivate only Thompson seedless, and the remaining cultivated other varieties like Sharad seedless along with Thompson seedless, for exports.

The survey found that India has not been successful in the cultivation and export of coloured varieties of grapes. Discussions with exporters and farmers indicated that although exports of grapes is increasing, globally there is a growing preference for coloured varieties of table grapes and India is facing stiff competition in this regard from countries such as South Africa and Chile, which have developed those grapes and are fast penetrating markets such as the EU. EU member countries as well as countries in Asia such as China are increasingly demanding coloured varieties of grapes. Further, some of these new varieties, which are exported by countries such as South Africa and Chile, also have a longer shelf life. The preference for coloured grapes with a longer life span often ensures better price realisation to the exporters of those countries as supermarket chains in the EU prefer to source such grapes. Thus, Indian table grapes are facing and will continue to face stiff competition in the EU market in the future from other exporting countries, which can adversely affect the prices and quantity of export in the future. Further, the EU market for grapes such as Thompson seedless is fast getting saturated.

Before one examines the barriers to exports, it is important to understand the export process and the supply chain.

4.2 Export Process and the Supply Chain

There are three broad categories of grape exporters in India:

(a) Grower exporters such as the Sahyadri Farms and Bafna Group

(b) Growers' co-operative such as Mahagrapes

(c) Exporters/traders such as Freshtrop Fruits Limited and ONS Express Private Limited.

Often, the grower exporters are either large farmers or they are farmer producer companies. Exporters/traders are primarily involved in procuring crops from a cluster of farms and exporting them to the EU member states, after ensuring that the product meets EU market requirements. The primary survey found that some of the companies such as Deepak Fertilisers and Petrochemical Corporation Limited that are engaged in providing extension services (for example, fertilisers) to grape growers/farmers in states such as Maharashtra are now engaged in exports of grapes and other fruits to the EU and other countries as they have a well-established network with farmers/grape growers.

To understand the supply chain of grapes from a farmer in India to a consumer in the EU member state, it is important to understand the agricultural sector in India, which is different from the sector in many EU member states. Unlike in the EU member states, the agricultural sector in India is dominated by a large number of small-sized, fragmented land holdings. As a

result, the scale of operation is limited and there is limited use of equipment and technology. There are very few large grape farmers/growers who have the capacity to export to large markets such as the EU. In most cases, either the small farmers have formed farmer's co-operatives to cater to import demand or they sell their produce to traders, who export their products. Depending on the model of operation, the supply chain varies. An indicative supply

chain of grape exports to the EU market is given below.

Figure 4.1: An Indicative Supply Chain of Grapes Exported to the EU Market

Source: Based on Inputs Received During the Survey

➢ *Farmers*

As mentioned earlier, in India, the farmer can either be a farmer exporter, or a grower co-operative or a cluster farm exporting to the EU. As per the Department of Commerce Notification Number 28, (Re-12)/2009-2014 dated 3 January, 2013, issued under Section 5 of the Foreign Trade (Development and Regulation) Act 1992, exports of fresh table grapes to the EU is permitted subject to registration with APEDA.

For exporting to the EU, there are certain pre-requisites.

Each farmer who intends to export directly or through an exporter has to register its farm/plots with the district superintending agriculture/tahsildar/horticulture officer (hereby known as concerned authority). The application fee is INR 50 (EUR 0.66)[65] per plot. The farmer has to provide a GLOBALG.A.P. certification number and details of his previous exports. Sometimes, exporters such as the Rainbow Group help farmers register on the *GrapeNet* system and they complete all formalities on payment of a nominal fee. The total cost to the farmer in such cases is around INR 350 (EUR 4.66).

After receiving the application from farmers, the concerned authority physically verifies the authenticity of the information. Only then is the information uploaded in the *GrapeNet* system. The concerned officer also has to verify that the plot is not under suspension or cancellation for export to the EU. If the plot is cancelled, he/she has to take back the registration certificate from the farmer.

The full contact details of the farmers, along with the exact location of the farm have to be uploaded on *GrapeNet*. The registered farmer has to keep a record of each chemical and pesticide used in the farm in a format given by APEDA. In other words, they have to keep a record of the package of practices followed by them. The farmers are not allowed to use

[65] All currency conversion from INR to Euro is made using the monthly average exchange rate of 1 Euro = INR 75.03 for the month of August 2016, provided by Eurostat database, unless otherwise specified.

chemicals that are under development trials and are not registered with the Central Insecticide Board and Registration Committee.

The farm registration with APEDA is valid for three years. However, all registered grape farmers have to renew their farm registration every year and this is done during the months of October-November. Late registration fee is charged for delay in registration (for example, if the farmer registers in December). The registration certificate is issued after the completion of the registration process.

After registration, the details of the crop have to be provided including the variety, details of the spray schedule and whether it matches with the schedule prescribed by the National Research Centre (NRC) for grapes.[66]

Since 1997, retailers in Europe established standards for good agricultural practices (GAP) called EurepGAP. These standards are applicable and accepted all over Europe. In 2007, to reflect the global outreach, EurepGAP was renamed as GLOBALG.A.P. All farms supplying to the EU have to obtain a GLOBALG.A.P. certificate. If an exporter is sourcing from farm clusters, he has to ensure that the farms are GLOBALG.A.P. certified; otherwise, the products will not be acceptable in the EU market. In India, since the size of the land holding is mostly small, most farmers apply for GLOBALG.A.P. certificate in a group or a cluster.

Once the crop is ready for harvest, the exporters contact the farmers and they notify APEDA approved laboratories to collect samples and test them for EU requirements. Authorised representatives of APEDA approved laboratories collect the samples from the farm and test them for EU safety norms.

➢ *Laboratory Tests*

The survey found that crops are tested for about seven pests and diseases including powdery mildew, downy mildew, anthracnose, mealy bugs, thrips, jassids and mites. Apart from these, tests are performed for any other pests or diseases or any other quality observations.[67] Further tests are conducted to check for pesticide residue. In 2016, around 42 residues had to be checked for. The list is provided by the EFSA to APEDA.[68]

After the samples are drawn and tests are conducted, the laboratory sends the reports to the exporter and identifies whether the product is fit for export to the EU. A template of the laboratory report is presented in Table 3. In this particular case, the sample collected from

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66 The National Research Centre for Grapes under the Indian Council of Agricultural Research was established in 1997 in Pune for strategic and applied research on safe grape production and productivity; transfer of technology and capacity building of stakeholders for enhanced and sustained production of grapes and National Referral Laboratory for Food Safety and Pesticide residue in fruits.

67 A detailed list of the pesticides that are tested for and their different nomenclatures are given in Appendix 4A.1.

68 For details, see the Procedure for Export of Fresh Table Grapes to the European Union for 2015-16, released in September 2015 accessible at http://traceability.apeda.gov.in/hortinet/Notice/procedureforexportofgrapes2015-16.pdf (accessed on 21 August, 2016)

farmer ABC located in Nashik contained more than the prescribed limit of Forchlorfenuron (plant growth regulator). As a result, the product failed the laboratory test. The second farmer, DEF passed the laboratory test and, hence, his crop was certified fit for export to the EU market.

Table 4.1: Template of Laboratory Report Sent to the Exporter by APEDA approved Labs

Date of Sample	**14/02/2016**				
Farmer Name	**ABC**				
Location	**Nashik**				
Farm Regi. No.	**MH00000001**		**First Sample**		
Exporter Name	**XYZ**				
Variety	**Thompson**				
Result					
Sr. No.	**Detected Pesticide**	**Result (Mg/Kg)**	**MRL (Mg/Kg)**	**% per residue**	**Remark**
1	Buprofezin	0.037	1	3.70	**Fail**
2	Cymoxanil	0.01	0.02	50.00	
3	Famoxadone	0.256	2	12.80	
4	Forchlorfenuron	0.015	0.01	**150.00**	
5	Chlormequat chloride	0.02	0.05	40.00	
6	Trifloxystrobin	0.01	3	0.33	
Total Pesticide % against MRL 256.83%					
Date of Sample	**16/02/2016**				
Farmer Name	**DEF**				
Location	**Nashik**				
Farm Regi. No.	**MH00000005**		**First Sample**		
Exporter Name	**UVW**				
Variety	**Thompson**				
Result					
Sr. No.	**Detected Pesticide**	**Result (Mg/Kg)**	**MRL (Mg/Kg)**	**% per residue**	**Remark**
1	Buprofezin	0.037	1	3.70	**Pass**
2	Cymoxanil	0.01	0.02	50.00	
3	Famoxadone	0.256	2	12.80	
5	Chlormequat chloride	0.02	0.05	40.00	
6	Trifloxystrobin	0.01	3	0.33	
Total Pesticide % against MRL 106.83%					

Source: Compiled by authors from survey inputs.

➢ *Exporters*

Once the laboratory issues a green signal to samples collected from a particular farmer, the exporter settles the price of the crop with the farmer. The crop is then harvested and the exporters bring the product to APEDA approved pack houses. In the export supply chain, processing facilities such as pack houses, and pre-cooling and storage facilities have to be approved by APEDA, adhering to EU standards.

Fresh table grapes that do not clear laboratory tests are either sold in the domestic market or are exported to other countries, which have less stringent food safety standards compared to the EU.

Image 4.1: Packaging and Labelling of Tables Grapes Exported to the EU

In the pack houses, the grapes are sorted according to physical attributes such as size and colour. The survey also found that good quality produce is exported to the EU market while poorer quality may be sold by farmers in the domestic market or may be exported to other countries. The price of grapes varies based on the quality. It was pointed out during the survey that farmers are paid INR 40-60 per kg for the general variety and INR 70-80 per kg for the premium variety (which is usually exported to the EU). Apart from this, the exporter incurs the cost of laboratory testing, transportation and packaging and labelling the products. The cost of laboratory testing in India is around INR 8000-9000 and the same product has to be tested again in the EU states, which entail an additional cost of around INR 40,000. The exporters sell the products to their EU agents, commonly known as importers. None of the exporters or growers interviewed sold their produce directly to supermarket chains. They get around Great British Pound (GBP) 2 per kg in the UK. Given the cost that they have to incur in the export of the produce, it is evident that Indian exporters operate on a very thin margin. It was also pointed out during the survey that the exporter's income is based on the exchange rate of the currency rather than the price of grapes. Most of them make money when the value of the Indian currency is low *vis-à-vis* British Pound or Euro.

The survey found that APEDA has been successful in establishing full supply chain traceability. Grapes are packed in boxes as per EU requirements and each box has a lot number, which is generated according to the date and month of harvest, farmer registration number, etc. This lot number is instrumental in tracing the product back to the farmer (see Image 4.1).

Once these products are packed in pack houses, they are dispatched in reefer vehicles to customs ports. Most of the export of grapes to the EU is from Mumbai's Jawaharlal Nehru Port (JNP).

➢ *Indian Customs*

The customs officers check all the documents and match them with EU requirements. If all the documents are in place, the products are dispatched to the EU. Grapes are mostly sent through the sea route and transportation takes around 21 days.

➢ *EU Ports*

Depending on the market, the port of entry at the EU is chosen. For instance, for the Netherlands and other countries in mainland Europe, it is the Port of Rotterdam; for the UK, it

is the Port of Felixstowe; for Germany, it is Hamburg Port, and so on. Once the containers arrive at the EU port, samples are drawn at the port and sent for laboratory testing. These samples are randomly drawn. Only if the samples are approved do the products get clearance from the EU authorities. The clearance is done by the exporter's agent or importer in the EU. In case there is any health and safety related issue, the problem is communicated to the importer, who further communicates it to the exporter in India. It is also flagged on the RASFF of the EU for issues related to pesticides and EUROPHYT for issues related to occurrence of pests. When multiple consignments are detected with health hazards, the issues are directly flagged to APEDA.

Between 1 January, 2000, and 30 April, 2016, around 40 notifications have been raised on the RASFF portal. A majority (17) of the notifications were raised in the year 2010 and amongst the EU member states, the maximum notifications were from the Netherlands. The notifications were classified as given below –

i. **Alerts**, which represent serious risk to the market. There were 6 alerts raised for table grapes.

ii. **Information**, which implies that a risk has been identified, which does not require rapid action either because the risk is not considered serious or the product is not on the market at the time of notification. There were 30 notifications classified under this category.

iii. **Information for attention**, which are related to a product that: (a) is present only in the notifying member country; or (b) has not been placed on the market; or (c) is no longer on the market. If the products clear the laboratory tests in the EU port of entry, then they are approved for sale in the EU market. The report is given to the importer. There were 4 notifications classified under this category.

➢ ***Importers, retailers and consumers***

The importer can also be an agent or a distributor. The importer then sells the product to retailers, which include large supermarket chains in the EU. Large retailers in the EU have tie-ups with importers. None of them source directly from Indian exporters. The survey found that better quality products are taken by the supermarkets such as Tesco PLC, while inferior quality is sold in the wholesale markets of the EU.

4.3 The 'ccc' Issue – Why Indian Table Grapes were detained in EU Ports in 2010

In 2010, when Indian grapes reached an EU port, samples were drawn for health and safety checks. These tests revealed that the grapes contained more than the permissible level of chlormequat chloride (ccc). The ccc is a plant growth regulator sprayed on crops to ensure that the plant does not grow beyond a certain height. The popular belief in India is that if the plant growth is regulated, then the yield is better. In India, ccc is sprayed 45 days after pruning, generally in the month of October.

The permissible level of ccc in 2010 was not in the list of chemicals given by APEDA to the laboratories to test in grapes exported to the EU. Hence, none of APEDA approved laboratories in India tested the MRL for ccc. The outcome was that Indian grapes failed to meet the laboratory tests in the EU because ccc levels were beyond the permissible level.

The survey found that different stakeholders have different views on what happened in 2010. These are presented below:

Exporter's View: All the exporters surveyed claimed that they did not have any notification from APEDA to test the MRLs of ccc nor were they aware that the EU had imposed such a limit. As a result, Indian laboratories did not test for the presence of ccc in Indian grapes. Exporters pointed out that if they were aware of the requirement, they would have adhered to it. Although the exporters and farmers blamed APEDA for the miscommunication, they also said that the importers did not communicate to them the MRL for ccc nor did they regularly monitor the EC websites of RASFF. Thus, there was an information gap.

Exporters exported their consignment under the impression that they had done the necessary laboratory testing and the reports had given export clearances. However, the test conducted at the EU port of entry on the same consignment rejected the consignments because ccc residue was over the permissible level of MRL, which was 0.05 mg/kg. As a consequence of the rejections, Indian exporter suffered tremendous losses. While the overall loss to the industry during the period was estimated to be around INR 2500 million (EUR 33.3 million), the loss of individual companies ranged between INR 25 million (EUR 0.33 million) to INR 100 million (EUR 1.33 million) depending on the size of the export consignments.[69]

When asked what they did with the containers that were detained at EU ports, some exporters said that they diverted the rejected products to other markets such as the Russian, East European and the Middle Eastern markets, since these were less restrictive. Some exporters brought the products back to India and sold them in the Indian market, while there were others who had to destroy the products at the port to save the additional cost of reverse shipment since grapes are perishable commodities.

When asked about how the rejection at the EU ports affected exporters and farmers, both farmers and exporters said that they had lost a significant amount of money. Some of them were unable to repay bank loans on time and became defaulters. Some of them brought back the shipment or stopped exports and then sold the produce in the domestic market. Further, farmers pointed out that if an exporter sources grapes from a farmer and if the produce gets rejected in the EU, then the farmer does not get a good price for the next harvest's produce. The farmers pointed out that they have to face volatile prices (they also get low prices if the harvest is good), and the risk of unforeseen thunderstorm and rain, which can damage the crop, etc., increasing their production risks. Other agents in the supply chain such as pack house

[69] See http://timesofindia.indiatimes.com/city/pune/Grape-export-suffers-loss-of-Rs-250-crore/articleshow/6216912.cms (accessed on 22 August, 2016) and findings from primary interactions.

owners were also financially affected by the EU's rejection and saw a business slowdown for two years.

Most exporters argued that it was the responsibility of APEDA and NRC to have communicated the EU requirement to the testing laboratories. Some further added that the Department of Commerce was perhaps negotiating with the EC on behalf of exporters to reduce the ccc MRL; as a result, no communication was made on this issue. Whatever may have been the case, since the laboratories did not test for ccc, farmers and exporters suffered a huge financial loss. Consequently, some of them such as Sahyadri Farms filed cases against APEDA either directly or through the Maharashtra Rajya Draksha Bagaitdar Sangh.

After this rejection, a series of meetings and interactions was held with APEDA and farmers and exporters and the latter became aware of the ccc requirement. Further, APEDA approved laboratories started testing for ccc MRLs as per the EC's requirements. While, in the survey, exporters do mention that the EC follows stringent health and safety standards, they also said that they would try to adhere to those standards if they were made aware of them. They pointed out that the fact that the export of table grapes from India to the EU has been rising since 2010 indicates that exporters and farmers can adhere to EC standards.

Further, it is an export requirement that there should be complete supply chain traceability from farmers to the retailer and the survey found that grape exporters and farmers (including small sized exporters and farmers) have been successful in establishing traceability.

APEDA's View: According to APEDA, the ccc issue came to the notice of Indian policymakers and APEDA as early as 2004 when around 2500-3000 containers of table grapes were detained in Germany and the Netherlands. After a discussion with exporters and other stakeholders, a residue monitoring protocol was installed and *GrapeNet* was put in place.[70] There are a number of chemicals that are restricted by the EU and if all the chemicals are to be tested in the laboratories, then it would entail a huge cost to exporters and may make export non-viable economically. Therefore, only those chemicals are tested that are identified under the residue monitoring protocol. The list of chemicals to be tested under the residue monitoring protocol is updated every year after discussions with exporters. Exporters are asked to consult their importers to get information from the EU. None of the exporters had raised the issue of ccc.

In 2010, when the containers were detained in EU ports, ccc was not in the residue monitoring protocol list and hence, APEDA approved laboratories did not test the MRLs of ccc. APEDA immediately raised this issue with the EU authorities and came to know that importers had asked for this requirement. While APEDA has tried to provide full support to exporters and farmers, in this case, exporters and farmers did suffer losses.

It was after this incident that APEDA, following discussions with farmers, launched the online system called *GrapeNet* to enable traceability throughout the grape supply chain from farmers to retailers/wholesalers. *GrapeNet* also ensures effective communication and information flow

[70] http://www.apeda.gov.in/apedawebsite/Grapenet/GrapeNet_new.htm (accessed on 21 December, 2016)

between policy makers in India and the EU, the nodal agency in India, exporters and farmers. Besides, it provides access to data that helps scientifically argue SPS cases.

The *GrapeNet* system is updated from time to time to incorporate changing export requirements in the EU and ensure that farmers are updated with EU import norms. The system also ensures a high level of compliance with EC's import norms, which entails checks and balances at several stages. With the *GrapeNet*, the farmers also became aware of good agricultural practices and have started implementing these.

View from the EU: According to the EC, the food safety regulations are put in place to protect EU consumers, EU producers as well as companies exporting to the EU. Every country/group of countries has the right to fix the level of MRLs depending upon food safety requirements. The MRLs for ccc for the EU came into effect in the year 2000 and it was included in Annex 1 to Directive 91/414/EEC on 1 December, 2009. This was communicated to APEDA. Further, Regulation (EC) No. 396/2005 of the European Parliament[71] provides for "*submission of applications for MRL"* under Articles 6, 7, 8 and 9 of the Act.

Article 6, (1) of the Regulation (EC) No. 396/2005 states that

> *"Where a Member state envisages granting an authorisation or a provisional authorisation for the use of a plant protection product in accordance with Directive 91/414/EEC, that Member state shall consider whether, as a result of such use, an existing MRL set out in Annex II or III to this Regulation needs to be modified, whether it is necessary to set a new MRL, or whether the active substance should be included in Annex IV. If necessary it shall require the party requesting the authorisation to submit an application in accordance with Article 7."*

Article 6, (2) further specifies that

> *"All parties demonstrating, through adequate evidence, a legitimate interest in health, including civil society organisations, as well as commercially interested parties such as manufacturers, growers, importers and producers of products covered by Annex I may also submit an application to a Member state in accordance with Article 7."*

Article 7 spells out the "Requirements relating to applications of MRL"

However, there were no concerns raised by India against the MRL of ccc prior to the year 2010. Further, the EC points out that even though there has been a study by EFSA regarding the MRL of ccc, its opinions as that of risk assessors are only part of the process. The final decision is taken by risk managers, in that case the EC/DG SANTE, and every decision needs to be

[71] Regulation and of the Council of 23 February, 2005 on Maximum Residue Levels of Pesticides in or on Food and Feed of Plant and Animal Origin and Amending Council Directive 91/414/EEC accessible at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:070:0001:0016:en:PDF (accessed on 23 August, 2016)

justified. Keeping in view that all age groups consume table grapes in the EU, the EC has set the standards to suit the consumption levels of children as well as adults.

4.4 The Recent 'ccc' Issue

The issue of MRL for grapes again came up in July 2016 via EU's notification to the WTO Committee on Sanitary and Phytosanitary Measures (SPS) Notification No. G/SPS/N/EU/168 (160-3636) dated 7 July, 2016.[72] In that, the EC proposed to lower the MRL for ccc in table grapes from 0.05 mg/kg to 0.01 mg/kg. The proposed date of adoption of the new limit is February 2017. APEDA is in the process of discussing the issue with the Indian Department of Commerce and EC. The survey showed that approximately 24.5 per cent of Indian table grapes exported to the EU may not meet this requirement if the MRL limits are lowered to 0.01mg/kg. This can adversely affect/lower Indian exports of grapes to the EU. Further, while every country has a right to protect its consumers, in Japan, the MRL for ccc is 0.10 mg/kg and for Australia and New Zealand, it is 0.75 mg/kg. In these countries, there are strong consumer protection regulations and food safety standards. Yet the MRLs for ccc are not as stringent as that proposed by the EC.

On a 6-point rating scale, the survey respondents were asked to rank the EU as an export market with 1 being a "very easy market to export" and 6 being "the most difficult market to export". On an average, the EU was given a rating of 5, i.e., "very difficult market to export". It was pointed out during the survey that this is because the EU seems to have the most rigid MRLs among India's export destination for table grapes. APEDA and exporters feel that the EU needs to justify the MRL limits through scientific study. EFSA has conducted a study in March 2016 entitled "Review of Existing Maximum Residue Levels for Chlormequat according to Article 12 of the Regulation EC No. 396/2005"[73] but this study does not cover table grapes. Hence, the scientific justification for this policy is not available to Indian exporters and policymakers. Further, although Codex Alimentarius Commission has not fixed or recommended the MRL in the case of table grapes, for other products it has recommended the MRL of 0.05 mg/kg as safe. A study conducted by the EFSA also found that the residue concentrates of ccc is safe up to 1.06 mg/kg.[74]

In October 2016, India expressed concerns regarding proposed amendments to Regulation (EC) No. 396/2005 to change maximum residue levels (MRLs) for bitertanol, tebufenpyrad and chlormequat in certain products including table grapes. In the case of table grapes specifically, India highlighted its particular concern with the lowering of MRLs for chlormequat in table grapes from 0.05mg/kg to 0.01mg/kg, which would seriously impact Indian grape exports to the EU, which accounted for almost 25 per cent of India's grape exports. India further noted that according to an EFSA study conducted in 2010, residue concentrates of chlormequat in table grapes were safe up to 1.06mg/kg. Codex had not fixed any acceptable daily intake limits for chlormequat in table grapes, but had recommended an MRL of 0.05mg per kg. India further highlighted that other countries had set higher MRLs for chlormequat in table grapes, such as Australia and New Zealand at 0.75mg/kg or Japan at 0.1mg/kg. The scientific reference

[72] For details see http://ec.europa.eu/health/endocrine_disruptors/docs/wto_eu166_en.pdf (accessed on 7 September, 2016)

[73] For details see https://www.efsa.europa.eu/en/efsajournal/pub/4422 (accessed on 7 September, 2016)

[74] For details see http://www.bezpecnostpotravin.cz/UserFiles/File/Kvasnickova2/EFSA_chlormequat.pdf (accessed on 5 September, 2016.

included in the EU notification did not provide any specific recommendation on grapes. Thus the proposed lower MRL had no scientific justification, was not based on any relevant international standard and would have negative trade effects.[75]

In its reply (dated 4 October 2016) to the comments submitted by India regarding SPS Notification G/SPS/N/EU/168, the EU recognised the efforts made by Indian producers and regulatory bodies to comply with the existing value of 0.05mg/kg. In the meantime, the EU was informed that trial data supporting the current value of 0.05mg/kg were submitted by the manufacturer and scheduled for evaluation by the Joint Food and Agriculture Organization (FAO)/World Health Organization (WHO) Meeting on Pesticide Residues (JMPR) in 2017. The EU is considering maintaining the MRL of 0.05 mg/kg for a temporary period to allow the assessment by JMPR and establishment of a Codex MRL. If no concerns are raised by EFSA, the EU could incorporate the codex maximum residue level (CXL) into EU legislation. As per the EC, the SPS Notification will be amended accordingly.

In the year 2010, when the Indian consignments were rejected in the EU, India did not have scientific data to prove its case nor was there a mechanism to trace consignments to farms. Today, the situation is different. Experts from APEDA and other trade bodies pointed out that India should ask the EC to provide scientific justification for proposing the residue levels for ccc so that it is not trade restrictive.

4.5 Other SPS Related Issues Faced by Grape Exporters

- ***Constantly Changing Standards*:** The EU changes it regulations frequently causing difficulties to farmers and exporters. For example, on 14 March, 2016, the EC sent a notification to the WTO Committee on Sanitary and Phytosanitary Measures[76] (G/SPS/N/EU/158) indicating its intention to reduce the maximum residue levels for 3-decen-2-one, acibensolar-S-methyl and hexachlorobenzene in products such as table grapes, eggplants, beans, peas and rice from 0.1 to 0.01 respectively. According to the notification,

  "lower MRL levels are set after updating the limit of determination and /or deleting old uses which are not authorized any more in the European Union or for which there is not enough data for an MRL to be set."[77]

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75 Source: WTO Committee on Sanitary and Phytosanitary Measures Document G/SPS/GEN/204/Rev.17 Dated 7 March 2017. Available at http://spsims.wto.org/en/OtherDocuments/Search?DoSearch=True&DocumentSymbol=G%2FSPS%2FGEN%2F204%2FRev.17&DistributionDateFrom=07%2F03%2F2017&DistributionDateTo=07%2F03%2F2017&SubmittingMembers=&SubmittingObservers=&SubmittingObserverOrganizations=&Secretariat=&DevelopmentStatus=&GeographicGroups=&Title=&Keywords=&DocumentTypes= (accessed on 17 April, 2017)

76 Link to the portal for the notifications: https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S005.aspx (accessed on 16 September 2016)

77 https://docs.wto.org/dol2fe/Pages/FE_Search/DDFDocuments/231008/q/G/SPS/NEU170.pdf (accessed on 21 September, 2016). See Page 1 of the document.

Again on 5 April, 2016, the EC sent a notification to the WTO Committee on Sanitary and Phytosanitary Measures (G/SPS/N/EU/160)[78] regarding lowering the MRL for cymoxanil, phosphine and phosphide salt, sodium 5-notriguaicolate and others for products like table grapes, mangoes and eggplant, among others, giving the same reasons as mentioned above. On the same day, another notification was given to the WTO Committee on Sanitary and Phytosanitary Measures (G/SPS/N/EU/161)[79] in which EC proposed new residue definitions for substances such as acrinathrin, befenthrin and carbetamide and lowered the level of MRL for these substances for produce such as table grapes. The changes in the MRLs of grapes are compiled in Table 4A.1 in Annexure A4.1.

- ***Issues with Health and Safety Norms*:** Export requirements for the EU are often more stringent than Codex Alimentarius standards or the standards of other developed countries (see Hoekman, 1998 and Henson and Loader, 2000). Moreover, private retailers also impose their own standards, which are even more stringent than EU standards, partly as a means to differentiate the products in their stores from other stores in the EU. As a result, to secure a market, Indian exporters have to meet various standards.

- ***Lack of Harmonisation in Testing*:** Laboratory tests are conducted both in India and the EU, which results in the imposition of costs twice over. The survey found that the average cost for the laboratory test in India is around INR 8000-9000 (EUR 106.62-119.95); in the EU the cost can go up to INR 40,000 (EUR 533.11). Additionally, the test reports may vary as different methods of sampling are followed. There are other issues related to harmonisation of standards for testing. If the product is only tested in EU member countries and fails the test, exporters have to bear the cost of transportation to the EU member state and then to other destinations. If the grapes fail the test in India, [then exporters can directly export it to other markets from India. Thus, survey participants differed in their opinions on whether there should be only one laboratory testing or not.

- ***Issues with GrapeNet:*** The concerned authority of the state governments in grapes growing states (state horticulture department, district superintending agriculture/*tahsildar*/horticulture officer) pointed out that in the traceability system, they have to take sole responsibility for any incorrect or incomplete information. During the interview with some of these officials, it was pointed out that they do not have simple equipment like internet enabled mobile tablets to upload information from the fields. They have to visit the field several times and the work is time consuming as they have to manually enter the data in their system. There are also chances of making errors in the process.

[78] http://www.spsvietnam.gov.vn/Data/File/Notice/586/NEU160.pdf (accessed on 21 September, 2016)
[79] http://www.spsvietnam.gov.vn/Data/File/Notice/585/NEU161.pdf (accessed on 21 September, 2016)

4.6 The Way Forward

The survey reveals that one of the major challenges facing Indian table grape exporters is the limited potential that the EU market offers. While the saturation of the EU market has been offset to an extent by the emergence of new markets such as Thailand, China, Russia and the Middle East, the shift in preference towards coloured varieties of grapes demands a shift away from the present domination of colourless varieties in India. A government initiative to accept offers from countries like South Africa to export varieties of coloured grape saplings will benefit grape farmers as well as ensure increased grape exports from India.

Many exporters pointed out during the survey that the government needs to more pro-active in its approach. Apart from providing support to wipe out the information gaps that have resulted in inflicting large losses on grape farmers, the government also needs to step in to ensure the adoption of improved technology as well as to train farmers and district level officers on various aspects such as fertiliser and pesticide use. The EU-India CITD programme offers opportunities for such training.

It is also necessary to step up research to develop new varieties of grapes using safe agricultural practices. Often, policies and remedies that are followed in other countries are adopted without taking into account their suitability to Indian climatic and other conditions. Adequate funding also needs to be provided for research that enables India to counter claims related to, for instance, MRL for chemicals. India should have a robust database and scientific research to counter proposals such as the one submitted by the EC to the WTO in July 2016. Agricultural universities should be encouraged to do research on such issues.

Policymakers, exporters and processors pointed out that if EC comes up with changes in MRLs as has happened in the case of ccc in July 2016, India should raise the issue in the WTO requesting scientific justification for such proposals. The EC on its part should provide the scientific justification. It needs to be pointed out that the EFSA study of March 2016[80] does not cover table grapes. The only EFSA report relevant to table grapes as of date and which is available in the public domain is the EFSA 2010 study on "Risk for Public Health due to the Presence of Chlormequat in Table Grapes from India", which concludes that:

"*The calculated acute threshold residue concentration for chlormequat on table grapes is 1.06 mg/kg. Consequently EFSA concludes that no acute consumer health risk is expected if table grapes with a mean chlormequat residue concentration of 1.06 mg/kg are consumed. The calculation is based on the most critical European consumer groups (German Child, body weight 16.15 kg) eating in one eating occasion 211.5 g of table grapes (13.1 g grapes per kg body weight). The calculation also takes into account a possible inhomogeneous distribution of the residues within the lot of grapes analysed."*[81]

[80] See https://www.efsa.europa.eu/en/efsajournal/pub/4422 (accessed on 21 December, 2016)

[81] See Page 1 of the Statement of EFSA on "Risk to Public Health Due to Presence of Chlormequat in Table Grapes from India", European Food Safety Authority, Parma, Italy accessible at https://www.efsa.europa.eu/en/efsajournal/pub/1590 (accessed on 7 September, 2016)

If EC wants to revise the MRL to 0.01 mg/kg for table grapes, a scientific study that justifies such a move should be made available to Indian policymakers, APEDA, exporters and farmers or else this should be considered an SPS barrier.

Besides, APEDA needs to involve state-level departments in capacity building initiatives. It was pointed out that technical assistance should percolate down to the farmers, exporters and state-level officers rather than being confined to central level agencies.

Another aspect that needs attention is the issue related to the disadvantage that Indian table grapes suffer from because of the absence of a trade agreement with the EU that results in exports from India attracting a tariff while exports from countries with which the EU has an agreement attracts no tariff. Since India does not have a trade agreement with the EU, exports of table grapes face an eight per cent tariff *vis-à-vis* zero tariff of grapes from countries which have a trade agreement with the EU. The EU-India Broad-based Trade and Investment Agreement may be useful in overcoming this barrier. Further, the agreement can be instrumental in harmonising standards across India and the EU. With mutual recognition of standards and laboratory certifications, testing can take place in one country only. While it is possible that exporters are likely to resist testing in EU member countries given the cost of transportation and the risk of getting their consignments rejected, this will offer exporters the choice to decide what they want to do.

The survey also highlighted the lack of marketing initiatives to boost the export of Indian table grapes. APEDA needs to market Indian grapes more aggressively in emerging markets like China.

Appendix A4.1: Some Examples of the Chemicals and Changes in their Limits for Table Grapes

Notification Number: G/SPS/N/EU/163 **Date: 6 April, 2016**										
Old Chemical Name	Cymoxanil		Phosphines and Phosphides		No Definition					
New Chemical Name	Cymoxanil		Phosphane and Phosphide Salts		Sodium 5-Nitroguaiacolate					
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL				
Table Grapes	0.2	0.3	0.05	0.01		0.03				
Notification Number: G/SPS/N/EU/161 **Date: 5 April, 2016**										
Current Residue Definitions	Acrinathrin (F)		Bifenthrin (F)		Carbetamide		Cinidon-ethyl (sum of cinidon ethyl and its E-isomers)			
Proposed New Residue Definitions	Acrinathrin and its enantiomer (F)		Bifenthrin (sum of isomers) (F)		Carbetamide (sum of carbetamide and its S isomer)		Cinidon-ethyl			
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL		
Table Grapes	0.05	0.01	0.2	0.01	0.05	0.01	0.05	0.05		
Notification Number: G/SPS/N/EU/160 **Date: 5 April, 2016**										
Chemical Name	Aclonifen (F)		Deltamethrin (cis-deltamethrin) (F)		Fluazinam (F)		Methomyl (F)		Sulcotrione (R) code 1000000 except 1040000 : CMBA (2-chloro-4-(methylsulfonyl) benzoic acid)	
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL
Table Grapes	0.05	0.01	0.2	0.2	0.05	0.01	0.02	0.01	0.05	0.01

Notification Number: G/SPS/N/EU/158 **Date: 14 March, 2016**										
Chemical Name	3-decen-2-one		Acibenzolar-S-methyl		Hexachlorobenzene (F)					
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL				
Table Grapes		0.1	0.01	0.01	0.01	0.01				
Notification Number: G/SPS/N/EU/144 **Date: 16 September, 2015**										
Chemical Name	Atrazine (F)		Potassium Thiocyanate							
	Current MRL	New MRL	Current MRL	New MRL						
Table Grapes	0.05	0.05		0.01						
Notification Number: G/SPS/N/EU/136 **Date: 29 June, 2015**										
Old Chemical Name	Diethofencarb		Mesotrione		Metosulam		Propiconazole		Spiroxamine (R)	
New Chemical Name	Diethofencarb		Mesotrione		Metosulam		Propiconazole (F)		Spiroxamine (A) (R)	
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL
Table Grapes	1	0.01	0.05	0.01	0.01	0.01	0.3	0.3	1	0.6

Source: Extracted from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S005.aspx (accessed on 16 September, 2016)

Chapter 5: Export of Basmati Rice from India: Opportunities and Constraints in the EU Market

India is the largest producer of Basmati rice in the world and it is an important commodity for trade between India and the EU. India has export potential in this product and there is demand for Indian Basmati rice in the EU. To understand the opportunities and barriers in the export of Basmati rice from India, a survey was conducted in Punjab, Haryana, Uttar Pradesh and Delhi. It included in-depth meetings with APEDA, EIC, All India Rice Exporters Association (AIREA), and exporters and processors. The survey covered 18 companies, out of which 17 are processors-cum-exporters and one is only an exporter. Among them, 11 companies export only Basmati rice, whereas the remaining 7 export both Basmati and non-Basmati varieties of rice. All the exporters have more than a decade of experience of exporting to the EU.

5.1 Introduction

"Basmati" is a variety of long grain aromatic rice grown in specific geographical areas of the Himalayan foothills of the Indian sub-continent. This variety of rice is identified by three distinct qualities: (a) long slender grain, (b) distinct aroma and flavour, and (c) post-cooking elongation (at least twice its original size). India is the largest producer of Basmati rice in the world followed by Pakistan.

This fragrant variety of rice has a high commercial value and demand in the international market, because of which, over time, many traders and farmers have indulged in fraudulent practices by mixing Basmati rice with similar looking non-Basmati rice or lower quality Basmati rice (Fridez, 2016). To prevent this, India has a Geographical Indication (GI) for Basmati rice in the WTO.[82] According to the WTO ruling; only certain varieties of rice grown in India and Pakistan can be labelled as Basmati.[83] Only 23 varieties[84] of long grain aromatic

[82] A geographical indication (GI) is a name or sign used on certain products which corresponds to a specific geographical location or origin (e.g. a country). The use of a geographical indication may act as a certification that the product possesses certain qualities, is made according to traditional methods, or enjoys a certain reputation, due to its geographical origin.

[83] https://www.researchgate.net/profile/Dr_Joginder_Singh2/publication/274376252_Sustaining_rice_crop_through_exploring_potentialities_of_basmati_with_reference_to_Indian_Punjab/links/551cccde0cf20d5fbde55b27.pdf (accessed on 16 June, 2016)

[84] A 24th variety is in the process of being recognised, according to the information provided by All India Rice Exporters Association.

rice in India are defined as Basmati rice under the Indian Seed Act, 1966, as listed in Table 5.1. The table includes 6 traditional varieties and 17 improved varieties.

Table 5.1: Rice Varieties Notified as Basmati Rice under the Seed Act, 1966

S. No.	Rice Variety	Name of the Institution that Released the Variety
1	Basmati 217	Punjab Agricultural University, Ludhiana
2	Basmati 370	Rice farm, Kalashah Kaku (now in Pakistan)
3	Type 3 (Dehradun)	Rice Research Station, Nagina, U.P
4	Taraori Basmati(HBC 19/ Karnal Local)	CCSHAU, Rice Research Station, Kaul, Dist. Kaithal, Haryana
5	Ranbir Basmati	Rice Research Station, R. S Pura, Jammu
6	Basmati 386	Punjab Agricultural University, Ludhiana
7	Punjab Basmati 1(Bauni Basmati)	Punjab Agricultural University, Ludhiana
8	Pusa Basmati 1	The Indian Agricultural Research Institute, New Delhi
9	Kasturi	Directorate of Rice Research, Rajendra Nagar, Hyderabad, A.P
10	Haryana Basmati 1	CCSHAU, Rice Research station, Kaul, Dst. Kaithal, Haryana
11	Mahi Sugandha	Rice Research Station, Banswara, Rajasthan
12	Pusa Basmati 1121 After amendment	The Indian Agricultural Research Institute, New Delhi
13	Improved Pusa Basmati 1(Pusa 1460)	The Indian Agricultural Research Institute, New Delhi
14	Vallabh Basmati 22	Sardar Vallabh Bhai University of Agriculture and Technology, Modipuram
15	Pusa Basmati 6 (Pusa 1401)	The Indian Agricultural Research Institute, New Delhi
16	Punjab Basmati 2	Punjab Agricultural University, Ludhiana
17	Basmati CSR 30 After amendment	The Central Soil Salinity Research Institute, Karnal, Haryana
18.	Pusa Basmati 1509	The Indian Agricultural Research Institute, New Delhi
19.	Malviya Basmati Dhan	Banaras Hindu University, Varanasi, UP
20.	Vallabh Basmati	Sardar Vallabhai Patel University of Agriculture and Technology, Modipuram UP
21.	Basmati 564	Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, Chatha, Jammu
22.	Vallabh Basmati 23	Sardar Vallabhai Patel University of Agriculture and Technology, Modipuram UP
23.	Vallabh Basmati 24	Sardar Vallabhai Patel University of Agriculture and Technology, Modipuram UP

Source: Extracted from http://www.airea.net/page/8/varieties (accessed on 14 September, 2016)

In the context of EU-India trade, a list of Basmati rice varieties is accepted by the EU as part of its agreement with India and Pakistan. The European Regulations – EC 1549/2004 and EC 1234/2007 [85] – contain a list of nine approved Basmati rice varieties from India and Pakistan

[85] EC 1549/2004, available at https://publications.europa.eu/en/publication-detail/-/publication/ca7e99d9-b845-46c4-ab25-2df8db99cc8f/language-en (accessed on 14 September, 2016) and EC 1234/2007, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:299:0001:0149:EN:PDF (accessed on 14 September, 2016)

which includes Basmati 370, Type-3 (Dehradun), Basmati 217, Ranbir Basmati, Taraori Basmati (HBC-19), Basmati 386, Kernel (Basmati), Super Basmati and Pusa Basmati (European Commission, 2010[86]; Fridez, 2016).

UK-based associations such as Rice Association, British Rice Millers Association and the British Retail Consortium (BRC) along with the Local Authorities Co-ordinators of Regulatory Services (LACORS) and the Association of Public Analysts (APA), the Federation of European Rice Millers and the Indian and Pakistani rice industry associations such as the All India Rice Exporters Association (AIREA) and the Rice Exporters Association of Pakistan (REAP) agreed on a 'Code of Practice on Basmati Rice',[87] which is a voluntary code that lays down minimum specifications for Basmati rice sold in the UK as regards import, milling and packaging to protect consumers from adulterated rice. This code has been approved for an additional six varieties of Basmati rice, namely, Basmati 198, Basmati 385, Haryana Basmati (HKR 228/IET 10367), Kasturi (IET 8580), Mahi Suganda and Punjab Basmati (Bauni Basmati). It also lists around 20 rice varieties that are not approved as Basmati rice and which may be used in fraudulent practices as fake Basmati (Fridez, 2016). This code also allows for a certain level of tolerance in mixing Basmati with non-approved varieties of Basmati rice, where the maximum level for non-approved varieties of Basmati rice was fixed at 7 per cent. Basmati rice exporters have to conduct a deoxyribonucleic acid (DNA) analysis to determine the authenticity of the Basmati rice and to check the proportion in which non-approved varieties are present.

In India, the EIC is the nodal agency for ensuring that all Basmati rice exports from India to the EU meet EU standards. The EIC monitors, supervises and audits rice mills and conducts DNA and other tests in EIC approved laboratories.

5.2 Production of Basmati Rice

In India, the production of Basmati rice has increased from 7217.67 thousand MT in 2010 to 8773.78 thousand MT in 2014.[88] Over the past 5-10 years, medium and large landholders have been cultivating Basmati rice on landholdings larger than the all India average landholding size. In the past, exporters sourced the Basmati rice from *mandis*, as pointed out by most of the exporters, processors and manufacturers that participated in the survey. However, of late, some companies are entering into contract farming and have started directly sourcing from farmers. Studies have shown that contract farming is encouraging small and marginal farmers to cultivate Basmati rice (Rangnekar *et al.*, 2010).

The total area under production of Basmati rice has increased from approximately 1.6 million hectares in 2012-13 to 2.1 million hectares in 2014-15, which is an increase of almost 31 per

[86] Link to the report: http://ec.europa.eu/agriculture/external-studies/2010/basmati/fulltext_en.pdf (accessed on 14 September, 2016)

[87] Code of Practice on Basmati Rice; available at www.riceassociation.org.uk/.../10/Basmati%20Rice%20Code%20of%20Practice.pdf (accessed on 14 September, 2016)

[88] Source: http://www.airea.net/page/60/statistical-data/state-wise-basmati-rice-production (accessed on 12 September, 2016)

cent.[89] The total production and state-wise production of Basmati rice is given in Table 5.2. The largest production of Basmati rice is in Punjab (with a share of approximately 40 per cent), followed by Haryana (39 per cent) and Uttar Pradesh (17 per cent).

Table 5.1: State-wise Area and Production of Basmati Rice in 2012-2013 and 2014-2015

States	2012-2013		2014-2015	
	AREA ('000 ha)	PRODUCTION ('000 MT)	AREA ('000 ha)	PRODUCTION ('000 MT)
Punjab	590.01	2292.75	857.68	3498.88
Haryana	711.11	2898.98	832.54	3701.88
Uttar Pradesh	318.75	1270.09	354.39	1260.69
Uttarakhand	18.30	54.16	20.34	66.41
Jammu and Kashmir	37.28	92.66	68.45	240.77
Himachal Pradesh	1.00	3.40	0.45	2.15
Delhi	1.00	4.09	0.70	3.00
Total	**1677.45**	**6616.13**	**2134.55**	**8773.78**

Source: Extracted from APEDA report Basmati Acreage & Yield Estimation in Punjab, Haryana, Delhi, Uttarakhand, Himachal Pradesh, Western Uttar Pradesh and Parts of Jammu & Kashmir, Volume 6, Table 3, page 6; available at http://apeda.gov.in/apedawebsite/trade_promotion/BSK-2014/Report-Volume-VI.pdf (accessed on 15 June, 2016)

5.3 International Trade and Key Markets for Basmati Rice

In the global market, rice is traded under two broad categories, namely, fragrant and non-fragrant. Within the category of fragrant rice, India is the leading exporter of Basmati rice to the global market, followed by Pakistan. Indian Basmati rice exports mainly consist of varieties such as Pusa Basmati, Basmati 370 and Taraori Basmati.

Basmati exports from India have increased steadily from 1.16 million MT in 2004-05 to an estimated 3.70 million MT in 2014-15. In 2014-15, India exported Basmati rice worth EUR 3,563,100,472[90] (INR 275.97 billion).[91] In the year 2013-14, India exported 3,757,271.44 MT quantity of Basmati rice, which decreased to 3,702,260.12 MT in 2014-2015. In 2015-2016, India's export of Basmati rice to the world increased to a total of 4,045,796.25 MT.[92] In 2014-15, approximately 42 per cent of Basmati rice produced in India was exported. Some of the well-known Basmati rice brands exported from India include Daawat, India Gate, Kohinoor, Lal Qilla, Amira, Hanuman Basmati, Mezban and Aeroplane.

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89 Source: APEDA

90 Converted from INR using the average exchange rate for 2014, calculated using the monthly rates from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; (accessed on 12 September, 2016); EUR 1= INR 77.45465

91 Source: AIREA

92 Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/Product_description_32head.aspx?gcode=0601 (accessed on 12 September, 2016)

As per AIREA, among India's key export markets, the Middle East accounts for two-thirds of the total exports (within which Saudi Arabia and Iran top the list). The top countries importing Basmati rice from India is presented in Table 5.3. Around 8 per cent of the total Basmati rice exports from India go to the US and the EU each. The exporter survey shows that their share of exports of Basmati rice to the EU in the total export of Basmati rice ranges between 4 to 25 per cent.

Table 5.1: Top 5 Destinations for India's Export of Basmati Rice

Country	2013-2014		2014-2015		2015-2016	
	Value (INR millions)	Value (EUR[93])	Value (INR millions)	Value (EUR)	Value (INR millions)	Value (EUR)
Saudi Arabia	67170.6	827820074.9	72588.7	937176141.1	54938.5	760450192.0
Iran	109757.1	1352661627.0	67589.7	872635729.0	37239.3	515460471.0
UAE	11859.6	146159926.7	19276.3	248872611.0	31107.0	430578551.0
Iraq	15997.2	197151311.5	15873.9	204944016.0	22311.5	308832181.0
Kuwait	15130.6	186471135.9	15332.3	197951485.2	13767.0	190561096.3

Source: DGFT, Ministry of Commerce and Industry, Government of India; available at http://commerce.nic.in/eidb/default.asp (accessed on 16 June, 2016)

The number of countries to which Basmati rice is exported from India has increased from 93 in 2003-04 to 143 in 2014-15.[94] The survey participants also confirmed that new export markets are being developed in a number of African countries. Thus, India's export market has diversified.

The EU is an important market for Indian Basmati rice (see Table 5.4). Within the EU, the UK is the largest market, followed by the Netherlands, which is largely the port of entry for mainland Europe.

93 Converted from INR using the average exchange rate for 2014 calculated using the monthly rates from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; (accessed on 12 September, 2016); EUR 1= INR 77.45465

94 Source: AIREA

Table 5.2: India's Export of Basmati Rice to the EU

Country	2013-14		2014-15		2015-16	
	Quantity (MT)	Value (INR millions)	Quantity (MT)	Value (INR millions)	Quantity (MT)	Value (INR millions)
United Kingdom	118,888.2	7,858.5	136,347.3	8,998.1	187,701.7	9,328.4
Netherlands	43,532.1	2,990.2	52,231.1	3,647.6	54,731.0	2,498.8
Belgium	34,498.9	2,417.7	29,900.0	2,221.4	37,516.0	2,191.1
Italy	39,840.0	2,849.2	31,467.4	2,179.7	36,805.6	1,815.3
France	18,971.6	1,270.3	18,009.2	1,104.9	21,951.4	1,063.8
Germany	9,295.4	833.6	13,513.5	1,188.0	15,005.7	983.6
Sweden	4,313.1	354.5	5,702.4	444.5	8,005.5	489.3
Poland	2,316.0	152.0	4,718.3	261.6	6,591.6	260.0
Spain	5,695.4	447.7	3,142.1	226.3	2,806.6	160.5
Portugal	3,952.0	270.8	4,328.0	236.8	2,763.0	109.5
Denmark	452.7	37.8	962.8	75.0	1,474.3	90.2
Greece	1,590.0	120.4	1,748.1	123.9	1,372.0	73.1
Austria	448.0	50.7	871.6	81.4	835.9	63.9
Ireland	236.0	20.1	428.0	31.9	953.5	56.1
Cyprus	706.0	56.6	572.9	44.1	767.2	46.4
Finland	82.0	7.4	81.0	6.4	297.0	19.6
Czech Republic	33.6	2.8	219.0	14.0	279.9	14.4
Lithuania	69.0	7.0	170.0	12.8	154.0	11.6
Malta	20.0	1.7	25.0	2.2	107.0	7.2
Bulgaria	25.0	2.1	25.0	2.0	118.0	6.2
Romania	44.0	4.0	93.0	7.2	111.0	6.0
Estonia	39.0	3.5	43.0	3.5	55.0	3.1
Croatia	10.0	0.8	59.0	4.2	42.2	2.3
Latvia	38.0	3.3	39.0	3.3	17.0	1.3
Hungary	0.0	0.0	333.0	23.2	0.0	0.0
Slovak Republic	75.0	5.8	0.0	0.0	0.0	0.0
Slovenia	4.0	0.3	0.0	0.0	0.0	0.0
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0
Total	**285,174.9**	**19,768.8**	**305,029.6**	**20,944.1**	**380,462.0**	**19,301.9**

Source: Compiled from APEDA. Available at http://agriexchange.apeda.gov.in/indexp/Product_description_32head.aspx?gcode=0601 (accessed on 12 September, 2016)

There has been a rise in the quantity of Basmati rice exports to the EU between 2013 and 2016. There was a rise in the value of export to the EU between 2013-14 and 2014-15, but a fall in value between 2014-15 and 2015-16. In the survey, out of 18 exporters, nine exporters said that their exports to the EU have increased in the past five years; five said that their exports to the EU have decreased and four said that there was no change in their exports. Those who said that exports to the EU have increased have given varied figures for the rate of increase, ranging between 4 and10 per cent each year.

5.4 The Export Process

Basmati rice in India is grown in select districts such as Dehradun (Uttarakhand), Sangrur (Punjab), Kangra (Himachal Pradesh) and Muzaffarnagar (Uttar Pradesh). Farmers from these districts bring paddy to nearby *mandis*, where an auction takes place to buy the paddy. In the *mandi*, details of the farmers and their produce are supposed to be recorded; however, the recording system is not uniform across *mandis* and procurement officers and agents usually do not ask for these details. Each *mandi* has a particular account number and there is a 'lot' number, which is allotted for produce from each farmer. In some *mandis*, the recording system is manual.

Representatives from the procurement team of processing companies/rice mills select the products from the *mandi*, fix the price, purchase the Basmati rice and bring them to the processing unit. In the past, processors and exporters were not allowed to source the produce directly from farmers due to restrictions imposed by states' Agricultural Produce Market Committee (APMC) Acts. Now, many states have revised their APMC Acts to allow direct sourcing and contract farming. But, it is still a relatively new concept, and in fact, in the survey, only one company was directly sourcing produce from farmers.

At the *mandi*, procurement officers or agents employed by various processors and exporters do a physical check of the product by hand; they have fairly good knowledge about the quality of rice that they are procuring. After this, the produce is sent to rice mills/processing units. At these units, another round of quality checks takes place. The products are tested for chemicals such as aflatoxin, heavy metals, pesticide residue, and tests such as genetically modified organism (GMO) testing (which is done in EU approved laboratories such as the Eurofins Group (Luxembourg) SGS (Switzerland), etc.,)[95] and DNA testing, as is required by the EU buyers. Most of the large exporting companies also have their own EIC approved laboratories for in-house testing. The list of various EIC approved laboratories is given by EIC.[96] They test for quality, weight of the paddy, size of the grain, etc. The product is then cleaned, stored in silos and processed. After this, grading and sorting take place. Another round of testing takes place at this stage. For exporting to the EU, the Authenticity Certificate[97] is issued by the EIC for duty exemption on 8 specific varieties of Basmati rice (the 8 varieties of husked brown rice, namely, Basmati 370, Basmati 386, Type-3 (Dehradun), Taraori Basmati (HBC-19), Basmati 217, Ranbir Basmati, Pusa Basmati and Super Basmati).[98] The EIC approves plant based on HACCP implementation. In this context, it is important to note that all FBOs are mandated to have HACCP by the FSSAI, whether they export or not.[99]

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95 European laboratories such as SGS, Eurofins Scientific and Bureau Veritas have established branches in India where the testing is done. These companies issue quality certificates to products being exported.

96 List of laboratories can be found at http://www.eicindia.gov.in/Approved-Units/Approved-Units/Lab_List.aspx (accessed on 15 September, 2016)

97 Source: http://www.eicindia.gov.in/Services/Compliance/authenticity.pdf (accessed on 15 September, 2016)

98 Source: http://apeda.gov.in/apedahindi/Announcements/On-line-Registration-BR.pdf (accessed on 15 September, 2016)

99 This information is provided by EIC.

EIC also has a scheme for quality check and pre-shipment inspection, which requires exporters to conform to certain standards of shipping and packaging when exporting Basmati rice.[100]

Since January 1, 2017, the EU has implemented the REX system where the exporter with a REX number will be able to self-certify the 'Statement of Origin' of their goods being exported to the EU under the GSP scheme. Since basmati rice is under GSP this will benefit the exporters. The nodal agency for REX is DGFT. Earlier EIC used to issue "Certificate of origin" for GSP benefits. The registration-cum-allocation certificate (RCAC) is issued by APEDA; exporters have to register online with APEDA for the certification.[101] Thus, a basmati rice exporter has to register with DGFT, EIC, APEDA and FSSAI for its export processes to be complete.

After the testing and certification process is completed, produce meeting the quality standards of the EU is transported to a dry port. Examples of dry ports for Basmati rice include Dadri (Uttar Pradesh), Tughlakabad (Delhi) and Rewari (Haryana). According to AIREA, Sonipat and Delhi are the major Basmati rice exporting centres. Sonipat is the hub for packaging, but most exporters have their offices in Delhi.

From the dry port, the produce is taken in containers to sea ports such as JNP in Mumbai. From there, the shipments are exported to EU ports (for example, Port of Rotterdam in the Netherlands and Port of Felixstowe in the UK), where buyers receive the produce. A large part of Basmati exports from India is brown rice. At the EU port, customs clearance agents and buyers such as Sona Food Traders (Germany), Bestway Group (UK), Saki GmbH (Germany) and Tilda Ltd. (UK) receive the produce and the brown rice is milled in local mills and converted to white rice.

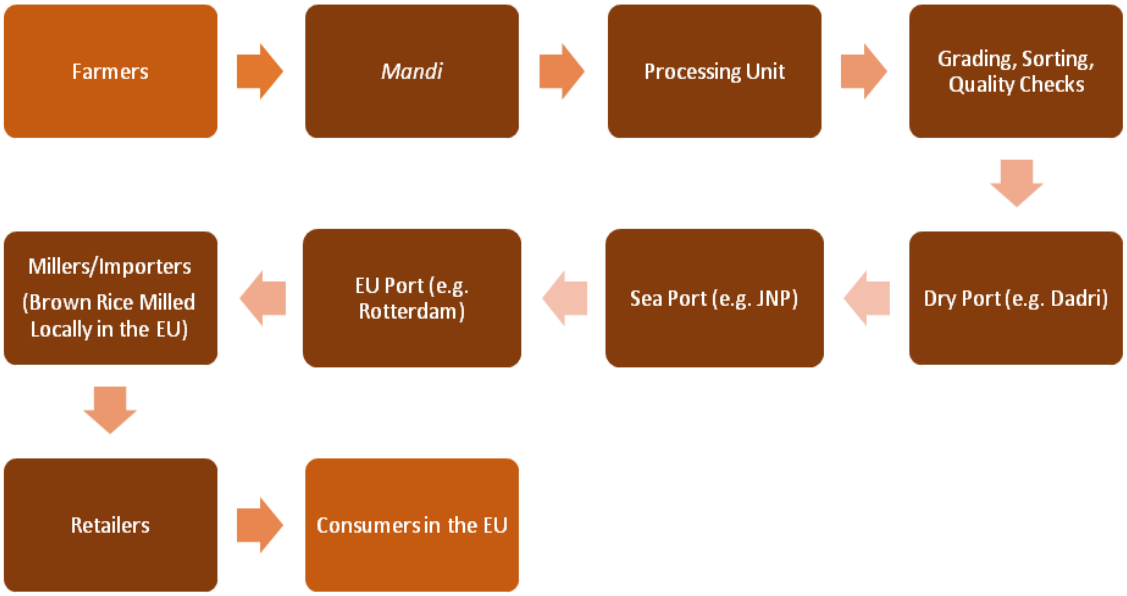
The survey found that some of these buyers visit local processing facilities in India before importing to ensure that EU regulations are met and quality is not compromised. From the mills in EU member states, the Basmati rice goes to retailers and then to final consumers. If the Basmati rice shipment fails to meet EU regulations at the port of entry in the EU, it gets rejected and does not enter the market.

Information on EU regulations is provided to exporters and processors by buyers in the EU, EIC and APEDA. When a consignment is detained at an EU port, the exporters get notifications from buyers and customs clearance agents.

The above information can be summarised in a supply chain for Basmati rice as given in Figure 5.1.

[100] Source: http://www.eicindia.gov.in/Services/Compliance/basmatirice.pdf (accessed on 15 September, 2016)
[101] Source: http://apeda.gov.in/apedawebsite/Announcements/Trade_Notice_Basmati_Rice_10_11_2014.pdf (accessed on 15 September, 2016)

Figure 5.1: Supply Chain of Basmati Rice



Source: Compiled by authors from the survey findings

5.5 SPS Issues Related to Exports of Basmati Rice

There are some SPS issues related to export of Basmati rice. These are discussed below.

- ***Aflatoxin Contamination of Basmati Rice:*** Aflatoxins are produced by fungi *Aspergillus flavus and Aspergillus parasiticus* that contaminate a variety of agricultural commodities including rice when exposed to heavy rain, humidity or poor storage conditions (see Mukhtar, *et. al*. 2016). For the EU, maximum levels of aflatoxins[102] (aflatoxins B1, B2, G1, G2 and M1) were laid down in Commission Regulation (EC) No 1881/2006[103] (the limit for aflatoxin B1 in maize and rice to be subjected to sorting or other physical treatment before human consumption or use as an ingredient in foodstuffs was set at 5 mg/kg). In the RASFF portal,[104] there were 12 notifications between 2000 and 2016 of rice from India being contaminated by aflatoxin B1 (the excess in aflatoxin B1 ranged from 5.5 mg/kg to 9.5 mg/kg).

  In the survey conducted, five exporters revealed that their shipments got rejected at different points of time because they contained aflatoxins beyond the permissible limits set by the EU. Since the shipments got rejected at EU ports, the options left with the exporters were to either get the shipments back to India or to export them to other countries, where the aflatoxin levels are more relaxed.

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102 Source: http://ec.europa.eu/food/safety/chemical_safety/contaminants/catalogue/aflatoxins_en.htm (accessed on 20 September, 2016)

103 Link to the Regulation: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006R1881-20140701 (accessed on 20 September, 2016)

104 Source: https://webgate.ec.europa.eu/rasff-window/portal/?event=searchResultList (accessed on 4 October, 2016)

- ***Rejection of Products for not Meeting the Prescribed MRLs:*** Between 1 January, 2000 and 30 April, 2016, there were 42 notifications on Basmati rice exported from India in the RASFF portal for not meeting the EU standards. Out of these 42 notifications, in 39 cases, the risk decision was reported as 'undecided', i.e., it was not decided whether the risk was serious or not serious. Yet, 25 out of the 42 notifications faced 'border rejection', which means that the consignment was refused entry into the EU for reason of a risk to human and animal health or to the environment. The maximum notifications were raised in the year 2014 (16 notifications). Among the EU member states, Italy raised the maximum number of notifications (34), followed by France (5).

  Out of the 42 notifications recorded for Basmati rice, the most common cause for rejection was the presence of pesticides, beyond the permissible limit. 36 notifications were for pesticide residues, 5 were for the presence of insects in the shipment (such as weevils and beetles) and one notification was for the presence of foreign body (screws) in the shipment. Out of all the notifications, aflatoxins had the maximum notifications (11), followed by Carbendazim (10), Acephate (7), Triazophos (2), Hexaconazole (2) and other miscellaneous pesticides (such as bromide, chlorpyrifos, ochratoxin and profenofos) (one notification each). A sample of the notifications extracted from the RASFF portal is given in Table 5.5. The survey also confirmed that there are some pesticides, which were regularly higher than the EU MRLs such as Carbendazim in spite of the consignments being tested in India. Foot rot, a fungal disease, can affect basmati rice and carbandazim is used to check this disease in India. There have been cases where 'organic' basmati rice consignments have been rejected in the EU for the presence of carbandazim.[105]

  In the case of tricyclazole, different countries have fixed different import tolerance limit. For example, the US has fixed the import tolerance in Indian rice at 3 parts per million (ppm)[106] while the EU has a MRL of 1 ppm[107] and Japan has allowed MRL of 3 ppm.[108] Thus, the EU has the most restrictive limit among developed countries.

  The notification given by the EC on the portal of the 'WTO Committee on Sanitary and Phytosanitary Measures', confirmed the survey findings that EU lowers the MRLs for different chemicals and pesticides frequently (see Appendix A5.1 for Basmati rice). A number of exporters pointed out that the MRLs set by the EU is lower than what Codex Alimentarius Commission recommends and, in some cases, lower than what the EFSA has found as minimum recommended standards. They also argued that they were unable to locate the scientific reason or research behind the MRLs for certain substances.

  The exporters also pointed out that every time the MRLs change, they have to conduct new tests in laboratories to ensure that the chemicals in their products conform to the new standards. This proves very costly for exporters as conducting such tests at short notice is expensive; moreover, many laboratories in India are not equipped to conduct such tests at

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105 See http://www.globaltimes.cn/content/734529.shtml for details (accessed on 14 February, 2017)

106 Source: https://www.globalmrl.com/db#query (accessed on 15 February, 2017)

107 Source: http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=pesticide.residue.displayMRL&language=EN (accessed on 15 February, 2017)

108 Source: http://www.m5.ws001.squarestart.ne.jp/foundation/agrdtl.php?a_inq=44800 (accessed on 14 February, 2017)

short notice. One exporter pointed out that that the MRLs were changed and new MRLs were implemented after a particular shipment had already been dispatched from India to the EU. In general, this should not be the case as the implementation of MRL changes take effect after 6 months of the notification being made by the EU to the WTO.

One exporter surveyed in our study faced such a barrier. One of their shipments of Basmati rice got rejected in Cyprus due to the presence of a high level of acephate pesticide. Earlier, all their shipments passed through, but because of the change in regulations, which they were not aware of, this particular shipment got rejected. The buyer in Cyprus (the importer) notified the exporter and sent them a report of the test conducted by the Cyprus government. The exporter was told that the shipment had to be destroyed or shifted out of Cyprus or returned to the exporter. The exporter decided to re-ship the consignment again to other countries, since the particular shipment in which they faced a problem regarding the acephate pesticide only went through stringent checks in Cyprus and Italy, and not in other countries. They received the shipment and sent it again to other buyers. All the re-packaging and re-shipping to other export destinations led to extra costs that were incurred by the exporter. This is an example of the impact of the SPS measures on the exporter. Further, it reflects that the measures are not equally restrictive across different ports on entry.

See Table 5.5 for a sample of border rejection details for Basmati rice.

Table 5.1: Some Examples of Border Rejection for Basmati Rice

Notification Date (DD/MM/YYYY)	Notification Issuing Country	Hazard Category	Substance/Hazard	Risk Decision
30/07/2010	Italy	Foreign Bodies	Infested with Insects	Undecided
18/10/2011	Italy	Pesticide Residues	Unauthorised substance Carbendazim	Undecided
18/10/2011	Italy	Foreign Bodies	Infested with Insects (beetles)	Undecided
13/02/2012	Italy	Pesticide Residues	Unauthorised substance Carbendazim	Undecided
06/09/2012	Italy	Pesticide Residues	Unauthorised substance Triazophos	Serious
21/02/2014	Cyprus	Pesticide Residues	Unauthorised substance acephate	Not Serious
25/03/2014	Italy	Pesticide Residues	Unauthorised substance acephate	Not Serious
03/02/2015	Italy	Pesticide Residues	Unauthorised substance profenofos	Undecided
10/03/2016	Italy	Composition	High Content of Aluminium	Not Serious
29/09/2016	Netherlands	Mycotoxins	Ochratoxin A	Serious
15/03/2017	Italy	Mycotoxins	Aflatoxins	Serious
21/03/2017	Finland	Pesticide Residues	Unauthorised substance acephate	Undecided

Source: Compiled from the RASFF Portal. Available at https://webgate.ec.europa.eu/rasff-window/portal/ (accessed on 6 April, 2017)

- ***Recent Lowering of the MRL for Tricyclazole:*** The debate on banning the chemical tricyclazole in the EU has been taking place for a long time (see Commission Decision 2008/770/EC[109]) due to the harm it may cause to human health. However, the risk assessment was inconclusive due to lack of scientific data. This fact was reiterated in the Standing Committee on Plants, Animals, Food and Feed held in Brussels (28 November 2016-29 November 2016), in which it was discussed that since the EU does not have enough data it will continue with the lowering of MRL for tricyclazole rather than imposing a ban. The data collection process in the EU is underway.[110]

  Meanwhile, on 14 October 2016, the EU confirmed the non-approval of tricyclazole as an active substance in the Commission Implementing Regulation (EU) 2016/1826[111] and made the ban on tricyclazole binding on its member states. It consulted its trading partners through the WTO and it was decided that, given the long shelf life of rice and products made of rice, there should be a transitional arrangement for rice grown in 2016 or before to allow normal marketing and consumption of rice. However, this transitional arrangement would not be applicable on products treated with tricyclazole in 2017 and thereafter. In the case of Basmati rice, because it undergoes a specific procedure of maturation before being placed on the market, a reasonable period was allowed for transition so that the member states and EU FBOs could prepare themselves to meet the new MRL requirements.

  On 16 November 2016, the Committee on Sanitary and Phytosanitary Measures of the WTO passed a notification[112] on reduction of the MRL of tricyclazole in certain products (including Basmati rice) from 1 mg/kg to 0.01 mg/kg[113] in the EU. The proposed date of adoption and publication of the notification is June 2017.

  Certain countries exporting rice (other than Basmati rice) to the EU such as Cambodia have already decided to ban tricyclazole. In March 2017, Cambodia's Ministry of Agriculture, Forestry and Fisheries announced that it will ban all agricultural pesticides containing the fungicide tricyclazole, following the EU's new MRL on the same.[114]

  This issue is not specific to the EU as an important destination. In 2013, Indian rice exports faced SPS issues in the US (and a subsequent fall in export quantity) due to the presence of residues of tricyclazole.[115] In the case of India specifically it is a common practice to use

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109 See http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008D0770&from=EN (accessed on 7 April, 2017)

110 Summary Report: https://ec.europa.eu/food/sites/food/files/plant/docs/sc_phyto_20161128_ppr_sum.pdf (accessed on 6 April, 2017)

111 See http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1826&from=EN (accessed on 7 April, 2017)

112 Notification G/SPS/N/EU/173. Available at http://spsims.wto.org/en/ModificationNotifications/View/136174?FromAllNotifications=True (accessed on 6 April, 2017)

113 Source: https://members.wto.org/crnattachments/2016/SPS/EEC/16_4739_00_e.pdf (accessed on 6 April, 2017)

114 Source: http://www.khmertimeskh.com/news/36979/ministry-bans-tricyclazole-imports/ (accessed on 6 April, 2017)

115 Source: Survey and http://economictimes.indiatimes.com/markets/commodities/united-states-finds-pesticide-residue-in-basmati-exports-plunge/articleshow/20851768.cms (accessed on 6 April, 2017)

tricyclazole in Basmati rice and exporters highlighted that up to 60 per cent of the rice exported from India can face this issue. Pakistan also faces similar issues.

- ***Diseases Related to Basmati Rice:*** In India, Basmati rice cultivation is susceptible to certain diseases. In the past, bacterial blight (BB) disease, caused by *Xanthomonas oryzae* pv. *oryzae (Xoo),* affected Basmati rice production in the years 1979 and 1980. Studies have shown that this disease can cause a yield loss of up to 50 per cent and lower the quality of the produce. The genetic set up of Indian Basmati rice makes it vulnerable to the disease and BB resistance through genetic modification may be difficult (see Pandey *et al.*, 2013).

  Bakanae caused by *Fusarium fujikuroi* (Nirenberg) is another serious disease affecting rice in India. The incidence of the disease has increased recently due to climate changes, particularly in North-West India, specifically Punjab, Haryana and Uttar Pradesh. A study conducted by Bashyal *et al.* (2016) showed that in their sample of 61 villages in Punjab, Haryana and Uttar Pradesh, almost all the villages observed the bakanae disease.

  Pests like the Khapra beetle (*Trogoderma granarium)* and the saw-toothed grain beetle (*Oryzaephilus surinamensis*) affect Basmati rice exports. In the RASFF portal, there were five cases between 2000 and 2016 where the shipments were not allowed to be distributed in the EU markets (particularly Cyprus, Finland and Italy) because they were infested with insects. Out of these five notifications, two were issued (one in 2011 and the other in 2014) due to the presence of beetles. The shipments were not allowed to enter the EU as they posed a serious health hazard. They were detained and declared obsolete.

  It is worth mentioning that pest infected rice is also a concern for exports to the US. In 2015, APEDA released a notification stating that from April 2016 onwards, export of rice to the US would only be allowed from rice mills and processing units registered with the Directorate of Plant Protection, Quarantine and Storage. For this, the concerned rice mills and processing units would have to apply for registration to the Directorate of Plant Protection, Quarantine and Storage.[116]

- ***Presence of heavy metals:*** One exporter said that their shipments got rejected due to the presence of heavy metals such as arsenic, lead and cadmium in the produce. This is a cause for concern as the rice is tested for the presence of heavy metals in Indian laboratories before shipping to the EU. This also indicates the variations in laboratory testing results that have been discussed above.

[116] Source: http://apeda.gov.in/apedawebsite/Announcements/rice_mills.pdf (accessed on 3 October, 2016)

5.6 The Way Forward

The above discussions show that Indian Basmati rice exports to the EU faces a number of SPS issues related to the MRLs of various chemicals and pesticides used in cultivation. A number of issues such as that related to the MRL of tricyclazole in the crop are at the farm level. Such issues have to be addressed by using the right chemicals and pesticides in the right quantities that are approved in the importing countries. Since the exporters and processors source from the *mandis*, they have limited control over the farm practices. Nevertheless, they need to know about the changes in the MRL for various chemicals and pesticides before exporting their products. In this area, there is a knowledge gap and exporters and processors need to know the EC's requirements. Further, there is need for training farmers in good agriculture practices as is done by countries such as Cambodia under FAO and EU funded projects.

The government can take measures as has been taken by countries such as Cambodia by banning the chemicals which are banned in key markets and by training the farmers in use of alternative chemicals and pesticides or providing them information on how to limit the use of the chemicals and pesticides to the approved MRLs. The government may also collect scientific facts and data to argue the case in the WTO. Since this product goes through official laboratory testing and export inspection process, it will not be difficult to get the data on chemicals and pesticides used. Further, using this data, the Department of Commerce can work together with the Ministry of Agriculture and Farmers Welfare to help the farmers in accessing the right inputs to counter the SPS barriers.

Ideally, a product going through an efficient export inspection process should not face rejections on grounds on higher than acceptable MRLs. Further, a number of rejections were in the year 2014 – India and the EU initiated the CITD programme during that time. However, organisations such as AIREA till the date of their survey on September 2016 had not participated in any training or capacity building programmes. It was suggested by AIREA that a training programme for Basmati rice exporters can be held in cities such as Karnal (Haryana), Sonipat (Haryana) and New Delhi under the EU-India CITD programme so that exporters and processors are made aware of the new MRLs and to help them meet the levels stipulated by the EU. It will be beneficial for Indian Basmati rice exporters if the EU-India CITD programme has a provision where a list of substances that have to be tested through EIC approved laboratories can be provided to exporters and AIREA as a part of the training and capacity building programme. This will make the exporters and processors more aware of the issues and they will try to ensure that they pick up the right products from the *mandis*.

There are a couple of issues related to laboratory test procedures in the EU and India. These issues can be resolved through (a) implementing uniform laboratory standards across India (b) informing laboratories promptly about any changes in EC food safety standards (c) greater collaboration between laboratories in India and the EU and (d) through sharing of information about scientific testing procedures in the EU.

The survey also showed that some of the concerns such as those related to aflatoxin may arise due to poor storage and transportation. This is also confirmed by Indian government

discussions in the WTO.[117] To identify where there is aflatoxin contamination in the supply chain, it is important to set up a traceability system and APEDA can set up this system. The EU member states such as the Netherlands, which have a highly developed and efficient logistics sector with superior technologies for storage and transportation, can provide such scientific training.

Given that the EU has established a system for common standards and practices across all its member states, it is somewhat difficult to understand why Indian consignments of Basmati rice had in the past been rejected in a port in an EU member state like Italy but was able to enter through a port in the Netherlands and the UK. Thus, in practice, there are variations in checking across ports. The EU may do a root cause analysis of the problem and resolve it.

It is important for Indian exporters and processors to meet the EU standards or else the products will get rejected at the port of entry. Exporters who have taken the initiative to ensure quality standards have seen a growth in exports to developed country markets. Box 5.1 highlights how a company has ensured adherence to quality standards. Thus, if a company wants to export it will adhere to the export standards, irrespective of any official export requirements. In this context, Indian exporters should become more responsible which will reduce the need for export inspection. Further, as pointed out by the EIC, all FBOs are now required to be HACCP certified by FSSAI, and, therefore, there is no need for plant approval for Basmati rice processors/exporters based on HACCP implementation.

Box 5.1: How an Exporter is Ensuring Compliance with EU Standards

Once a lot of Basmati rice is prepared at our rice mill, we depute an inspection agency/laboratory which is acceptable to the EU buyer. The inspection agency/laboratory inspects the lot and samples the cargo and seals the lot. The sample taken out by the inspection agency is divided into 4 smaller samples of 1 kg each. One sample is sent to the buyer for testing and approval, one is kept by us for our record, one is taken by the inspection agency for physical testing and the other is sent to a European laboratory such as Neotron (in Italy) or RIZLAB (in France). The buyer at his end checks the sample for all parameters and gets it tested for DNA, pesticide and other EU requirements. In the meantime, the EU laboratory gives its results to us regarding pesticide residue. The inspection agency gives their approval only for the physical characteristics and not testing. All testing is done by the buyer and EU laboratories. Only after the buyer approves the sealed samples of the inspection agency sent by us do we send the shipment from India.

Source: Taken from the survey

[117] For details see Das, 2008.

Appendix A5.1: Some Examples of Chemicals and the Change in their Limits for Basmati Rice

Notification Number: G/SPS/N/EU/163 **Date: 6 April, 2016**										
Old Chemical Name	Cymoxanil		Phosphines and Phosphides		No Definition					
New Chemical Name	Cymoxanil		Phosphane and Phosphide Salts		Sodium 5-Nitroguaiacolate					
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL				
Rice	0.05	0.01	0.1	0.05		0.03				
Notification Number: G/SPS/N/EU/161 **Date: 5 April, 2016**										
Current Residue Definitions	Acrinathrin (F)		Bifenthrin (F)		Carbetamide		Cinidon-ethyl (sum of cinidon ethyl and its E-isomers)			
Proposed New Residue Definitions	Acrinathrin and its enantiomer (F)		Bifenthrin (sum of isomers) (F)		Carbetamide (sum of carbetamide and its S isomer)		Cinidon-ethyl			
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL		
Rice	0.05	0.01	0.05	0.01	0.05	0.01	0.1	0.05		
Notification Number: G/SPS/N/EU/160 **Date: 5 April, 2016**										
Chemical Name	Aclonifen (F)		Deltamethrin (cis-deltamethrin) (F)		Fluazinam (F)		Methomyl (F)		Sulcotrione (R) code 1000000 except 1040000 : CMBA (2-chloro-4-(methylsulfonyl) benzoic acid)	
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL
Rice	0.05	0.01	2	1	0.05	0.02	0.02	0.01	0.05	0.02

Notification Number: G/SPS/N/EU/144 **Date: 16 September, 2015**										
Chemical Name	Atrazine (F)		Potassium Thiocyanate							
	Current MRL	New MRL	Current MRL	New MRL						
Rice	0.1	0.05		0.01						
Notification Number: G/SPS/N/EU/136 **Date: 29 June, 2015**										
Old Chemical Name	Diethofencarb		Mesotrione		Metosulam		Propiconazole		Spiroxamine (R)	
New Chemical Name	Diethofencarb		Mesotrione		Metosulam		Propiconazole (F)		Spiroxamine (A) (R)	
	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL	Current MRL	New MRL
Rice	0.05	0.01	0.05	0.01	0.1	0.01	0.7	1.5	0.05	0.01

Source: Extracted from https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S005.aspx (accessed on 16 September, 2016)

Chapter 6: Case of the Dairy Sector in India: Scope for Export to the EU Market

In this chapter milk export refers to export of milk products such as skimmed milk powder (SMP) and whole milk powder (WMP) and milk based products such as butter, cheese, ethnic sweets and ready-to-eat food. With a share of 18 per cent in global milk production, India is the largest producer of milk in the world, followed by the US, China, Pakistan and Brazil.[118] *India also has a large consumption base for milk and milk products. Due to high domestic demand, export of milk products such as SMP/WMP was banned in India for a couple of years. It is only recently that the Indian government has allowed export of milk products such as SMP and WMP. Given that India has a large production base, has established a fairly robust export control process and there is a demand for Indian ethnic milk products in key markets, this case study focus on the scope for exporting milk products to the EU.*

This study is based on a primary survey conducted in India covering the major milk producing states, namely Gujarat and Uttar Pradesh. Interviews were conducted with milk based product exporters in Mumbai, Pune, Delhi and Kolkata. The survey covered milk co-operatives such as the Gujarat Co-operative Milk Marketing Federation Limited (GCMMF) (with brands such as 'Amul' and 'Sagar') and Mother Dairy Fruit & Vegetable Private Limited, private companies such as Parag Milk Foods Limited, foreign joint venture companies such as Schreiber Dynamix Dairies Limited, ethnic sweet and ready-to-eat manufacturers such as Haldiram Bhujiawala Limited, Bikanerwala Food Private Limited, Tasty Bite Eatables Limited and Gits Food Products Private Limited. In total, 10 producers and exporters were surveyed. In-depth meetings were also held with industry bodies such as the National Dairy Development Board (NDDB), state government departments in states like Gujarat, APEDA and EIC. Meetings were also conducted with the Department for Environment, Food and Rural Affairs (UK).

Image: From Co-operative to Private Farming

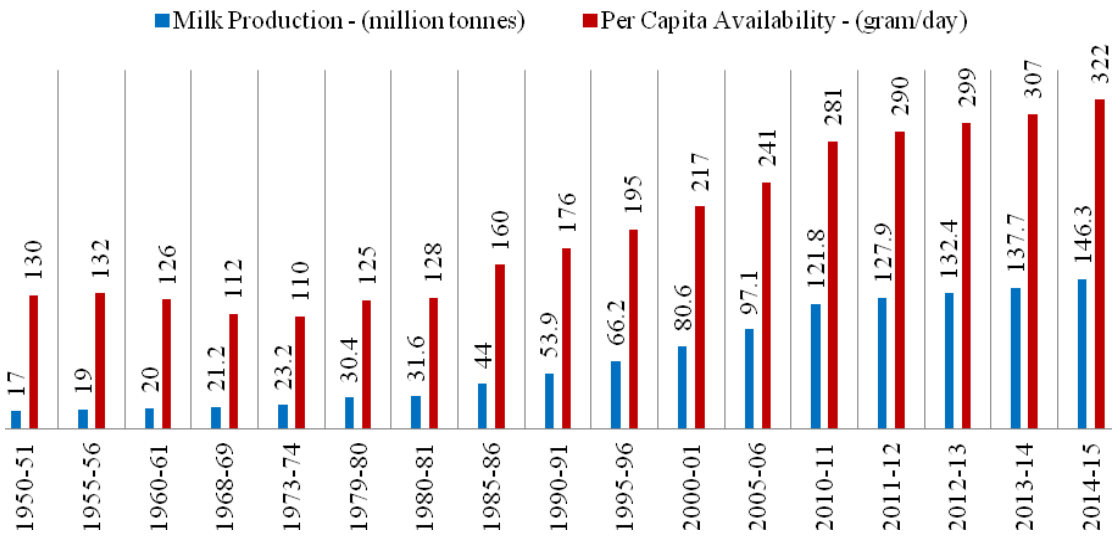
Source: Image http://indianexpress.com/article/india/india-news-india/mother-dairy-revises-milk-prices-in-delhi-ncr-by-one-rupee-2917263/; http://www.mid-day.com/articles/a-very-moo-ving-encounter/212535 (accessed on 30 September, 2016)

[118] For details see http://www.fao.org/agriculture/dairy-gateway/milk-production/en/#.V2lIuZN96fU (accessed on 31 May, 2016)

6.1 Overview of the Dairy Sector

India is the largest producers of milk in the world. Milk production and per capita availability is given in Figure 6.1.

Figure 6.1: Milk Production and Per Capita Availability in India (1950-2015)

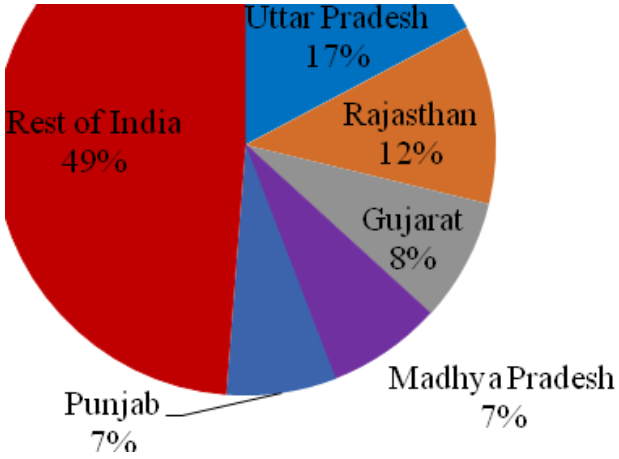


Source: Data extracted from https://community.data.gov.in/milk-production-in-india/ (accessed on 1 June, 2016) and Department of Animal Husbandry, Dairying and Fisheries.

The domestic demand for milk in India is high. According to the Food and Agriculture Organization (FAO) of the United Nations, in 2015, India's milk consumption was valued at 489 thousand MT, which was met by domestic production. In spite of this success, there are some areas of concern. While production and per capita availability of milk has increased, the productivity of the dairy sector remains low. The average milk yield of a cow was 1350 kilograms per annum in 2013, which is 42 per cent less than the global average (International Food Policy Research Institute (IFPRI 2016).

Milk production is concentrated in a few states in India. More than 50 per cent of the production of milk is in five states, namely Gujarat, Uttar Pradesh, Madhya Pradesh, Punjab and Rajasthan (see Figure 6.2).

Figure 6.2: State-wise Milk Production (percentage share)



Source: Extracted from NDDB Database. Available at http://www.nddb.org/information/stats/milkprodstate (accessed on 3 May, 2016)

Dairy farming in India is dominated by small holders, who are into subsistence farming. Individual households with two or three animals with limited productivity characterised the sector in India. According to a study by Kumar, *et al.* (2013), about 80 per cent of raw milk comes from farms having only two to five cows/buffaloes; nearly one-third of the milk is retained in the farm for consumption and only two-thirds enter the market. Operation Flood tried aggregating these small farmers and bringing them to the market through a co-operative farming model, which is still prevalent in the Indian dairy sector.

Over time, policies changed. Until the nineties, policies of the government focused on linking farmers to the market through a co-operative model, thereby addressing the issue of fragmented poor farmers and lack of economies of scale. While the government did focus on modernising the dairy farming sector, policies were always in support of co-operative farming, which was to protect the interest of Indian marginal dairy farmers who were completely dependent on income generated from selling milk to co-operatives.

After liberalisation in the 1990s, there was a gradual shift in policy focus towards private sector development. This led to an improvement in the processing capacity of the private sector (see Table 6.1). The processing capacity of the private sector and co-operatives were on par until 2002-03. However, by 2012-13, the capacity in the private sector expanded rapidly to become 70 per cent more than that of co-operatives (IFPRI 2016). These private players have certain advantages over the erstwhile co-operative system. They can establish traceability for the milk and many of them have cow milk unlike the co-operatives which have cow milk, buffalo milk and mixed milk. Some of them have foreign joint ventures and are exporting to over 35 countries.

Table 6.1: Key Trends in the Dairy Farming Sector

Variable	1992-93	2002-03	2012-13
Number of Dairy Plants			
Co-operative	194	212	263
Private	250	403	765
Others	65	63	37
Total	509	678	1065
Processing Capacity (000 Litres/day)			
Co-operative	24207	28394	43251
Private	24432	32415	73252
Others	7270	12170	3046
Total	55909	72979	119549

Source: Extracted from IFPRI 2016, Table 2.1, Page 5.

According to the APEDA's Annual Report (2014-15),[119] APEDA and Russia's Federal Service for Veterinary and Plant Control (*Rosselkhoznadzor)* have agreed to increase co-operation to boost food exports from India, which includes dairy products to Russia through technical consultations and e-certification systems. Russia has lifted restrictions on the import of milk products, cheese and other dairy products from India. Further, APEDA in consultation with the EIC recommended names of leading dairy plants for inclusion of their units for inspection by Federal Service for Veterinary and Plant Control (*Rosselkhoznadzor)* of Russia for market access.[120] Following this, another report[121] found that only two private farms were approved as *Rosselkhoznadzor* approved only Indian farms that owned at least 1,000 cattle.

Besides milk products like SMP/WMP and milk based products such as cheese, there is a growing market in the world for Indian ethnic sweets and ready-to-eat products (that contain dairy components). Companies such as Gits Food Products Private Limited and Tasty Bite Eatables Limited export ready-to-eat Indian processed foods such as *dal makhani*, *palak paneer*, *tarka dal, chana masala,* ready-to-make precooked food and Indian ethnic sweets such as *gulab jamun* and *jalebi*. According to the survey, the market share of ready-to-eat food in the EU is growing by 10-20 per cent, but Indian ethnic sweet manufacturers using dairy products have seen stagnation in growth due to the certain restrictions imposed by the EU on the import of dairy products for health and safety reasons which are discussed in Section 6.2.

[119] Accessible at http://apeda.gov.in/apedawebsite/Annual_Reports/Apeda_Annual_Report_English_2014-15.pdf (accessed on 11 April, 2017)

[120] Accessible at http://apeda.gov.in/apedawebsite/Annual_Reports/Apeda_Annual_Report_English_2014-15.pdf (accessed on 11 April, 2017)

[121] Published by Business Standard, accessible at http://www.business-standard.com/article/companies/russia-opens-dairy-market-but-indian-exporters-face-pricing-barrier-116050300295_1.html (accessed on 11 April, 2017)

6.2 Trade in the Dairy Sector

India is a net exporter of milk products such as SMP/WMP and the total export of milk products is less than one percent.[122] In 2015-16, India's export of milk and milk products to the world amounted to INR 7555.13 million (EUR 104.58 million)[123] while India imported milk and milk products worth INR 3223.01 million (EUR 44.61 million). India's major dairy export destinations include Bangladesh, UAE, Pakistan and Nepal. Some of the key items of export include skimmed milk (HS 04021010), melted butter (*ghee*) (HS 04059020), butter (HS 04051000), cheese (HS 04061000 and 04069000), and other milk and cream in powder (HS 04021090).[124].

The exports of dairy products to the EU have to meet EU regulations. In the EU, there are separate import procedures for food products of animal origin and of non-animal origin. During the meetings with the Department for Environment, Food and Rural Affairs (DEFRA) UK, it was pointed out that the regulations for the import of products of animal origin are more stringent for health and food safety reasons. There are conditions related to animal feed and hygiene as well as the hygiene of food products. Products of animal origin from third countries must comply with requirements that prevent the introduction of animal diseases into the EU. The EU is particularly concerned with FMD in the case of milk and milk products and has implemented several regulations laying down conditions for imports. These include the following:

- **Commission Implementing Regulation (EU) No 209/2014** of 5 March, 2014 amending Regulation (EU) No 605/2010 as regards animal and public health and veterinary certification conditions for the introduction of colostrum and colostrum-based products intended for human consumption into the Union
- **Commission Implementing Regulation (EU) No 468/2012** of 1 June, 2012 amending Regulation (EU) No 28/2012 laying down requirements for the certification of imports into and transit through the Union of certain composite products
- **Commission Regulation (EU) No 28/2012** of 11 January, 2012 laying down requirements for the certification for imports into and transit through the Union of certain composite products and amending Decision 2007/275/EC and Regulation (EC) No 1162/2009
- **Commission Regulation (EU) No 605/2010** of 2 July, 2010 laying down animal and public health and veterinary certification conditions for introduction into the European Union of raw milk and dairy products intended for human consumption

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122 This includes HS 4012000 to 4069000.

123 Converted from INR using the average exchange rate for 2015-16 calculated using the monthly rates from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; (accessed on 5 October, 2016) EUR 1= INR 72.244725

124 Based on the data provided by the Directorate General of Foreign Trade

- **Commission Regulation (EC) No 1162/2009** of 30 November, 2009 laying down transitional measures for the implementation of Regulations (EC) No 853/2004, (EC) No 854/2004 and (EC) No 882/2004 of the European Parliament and of the Council
- **Commission Decision** of 17 April, 2007 concerning the list of animals and products to be subject to controls at border inspection posts under Council Directives 91/496/EEC and 97/78/EC
- **Council Directive 97/78/EC** of 18 December, 1997 laying down the principles governing the organisation of veterinary checks on products entering the Community from third countries
- **Council Directive 96/23/EC** of 29 April 1996 on measures to monitor certain substances and residues thereof in live animals and animal products and repealing Directive 85/358/EEC and 86/469/EEC and Decisions 89/187/EEC and 91/664/EEC

Various directives provide the list of third countries[125] including India that can export milk products such as SMP/WMP and milk-based products to the EU, after meeting certain health and food safety requirements.

India's residue monitoring plan for milk products such as SMP/WMP and milk-based products is in line with the Council Directive 96/23/EC of 29 April, 1996.[126] Besides obtaining a health certificate for milk products such as SMP/WMP and milk-based products exported to EU member states, India is also required to comply with certain other requirements, including heat treatment, storage and traceability requirements and safety guarantees (also see Box 6.1).[127] The EC lays down regulations for all stages of the dairy supply chain, such as production, processing and distribution of animal products meant for human consumption (Council Directive 2002/99/EC). In addition, Regulation (EC) No 178/2002, Regulation (EC) No 852/2004, Regulation (EC) No 853/2004, Regulation (EC) No 854/2004 and Regulation (EC) 882/2004 form the legal base for the public health rules for trade and introduction into the EU. Regulation (EU) No 605/2010 lays down different import conditions depending on the animal health status of the exporting country as regards foot-and-mouth disease and rinderpest.[128] Thus, the process of export of milk products and milk based products to the EU is complex and several requirements have to be adhered to.

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125 Third countries are countries that are outside the EU.

126 The residue monitoring plan for 2017-18, as released by the EIC is accessible at http://www.eicindia.gov.in/Services/Pre-Compliance/PDF/RMP%202017-18%20Milk%20Products.pdf (accessed on 11 April, 2017)

127 Source: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:175:0001:0024:EN:PDF (accessed on 7 October, 2016)

128 Source: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0209&from=EN (accessed on 7 October, 2016)

Box 6.1: Requirements for Introduction of Milk and Milk Products for Human Consumption into the EU

In general:

- The non-EU country of origin must be authorised for introduction of milk and milk products into the EU
- The establishment of origin must be approved and authorised as an establishment, from which milk and milk products may be introduced into the EU
- The third country of origin must have an approved residue plan

The non-EU country must fulfill certain requirements to be authorised for the introduction of milk and milk products. The most important aspects to be evaluated before authorisation are:

- the organisation, structure, competence and empowerment of the veterinary services
- the legislation of the third country
- the non-EU country's rules on the prevention and control of animal diseases
- the health status of livestock, other domestic animals and of wildlife
- the regularity and rapidity of information on infectious animal diseases provided by the third country to the European Commission and to the World Organisation for Animal Health (OIE)
- the health requirements for the production, manufacture, handling, storage and dispatch of products of animal origin

Audits: Before a non-EU country is authorised to introduce milk and milk products into the EU, the Commission may carry out an audit to verify that all the criteria provided for under EU legislation are properly fulfilled.

Authorised third countries: Based on the principles contained in EU legislation and the results of the Commission audit, the non-EU country may be added to the list of third countries authorised for the introduction of milk and milk products into the EU, contained in Commission Regulation (EU) No 605/2010 laying down animal and public health and veterinary certification conditions for the introduction into the European Union of raw milk, dairy products, colostrum and colostrum-based products intended for humanconsumption. A non-EU country must be listed in that Regulation before exporting milk and milk products to the EU.

This Regulation contains details of animal health requirements and the appropriate veterinary certificate models required for introduction of milk and milk products into the EU.

Authorised establishments: All imports of milk and milk products into the EU must come from an approved establishment that has been authorised and listed for that purpose. The third countries are responsible to keep the lists of establishments up to date and to inform the Commission of any changes. Lists of establishments in non-EU countries that are authorised to produce fresh meat are published on the Commissions webpage.

Veterinary certificates: The veterinary certificate is required to ensure that milk and milk products can be introduced safely and must accompany all consignments of milk and milk products entering the EU. The veterinary certificates for milk and milk products are laid down in Commission Regulation (EU) No 605/2010.

Public Health: Certain public health requirements must be met. For example, a non-EU country is required to have an approved "residue" monitoring plan.

Border Inspection and traceability: Milk and milk products entering the EU are inspected at an EU Border Inspection Post (BIP) - listed in Annex I to Commission Decision 2009/821/EC - where Member States' official veterinarians ensure the milk and milk products fulfills all the requirements provided for in the EU legislation. Council Directive 97/78/EC lays down the principles governing the organisation of veterinary checks on products of animal origin entering the EU from non-EU countries.

TRACES (TRAde Control and Expert System) is an informatics system managing import controls at BIPs and ensuring traceability and uniform controls within the EU.

The importers must follow the procedures laid down in Commission Regulation (EC) No 136/2004 before, during and after the entry of the goods of animal origin into the EU via a BIP.

Source: Extracted from https://ec.europa.eu/food/animals/animalproducts/milk_en (accessed on 13 April, 2017)

As per the EC's Food and Veterinary Office (FVO) residue mission report released in 2009[129], no dairy establishments were approved for export to the EU. The report concluded that the residue controls in milk products did not provide guarantees equivalent to those laid down in Council Directive 96/23/EC.[130] The report made certain recommendations. For example, with

[129] See Page 4 of the Food and Veterinary Office (FVO) residue mission report accessible at http://admin.indiaenvironmentportal.org.in/files/FVO%20Final%20Report%20India%20September2009%5B1%5D.pdf (accessed on 11 April, 2017)

[130] See Page 27 of the Food and Veterinary Office (FVO) residue mission report accessible at http://admin.indiaenvironmentportal.org.in/files/FVO%20Final%20Report%20India%20September2009%5B1%5D.pdf (accessed on 11 April, 2017)

respect to milk products, the report recommended that formaldehyde should not be added to milk samples.[131]

In order to see whether the exporting country has incorporated the FVO recommendation and is meeting the standards set in the commission regulations and Council Directives, the EC conducted an audit in India in May 2011 and published the audit report.[132] The objective of the audit was to evaluate the implementation of national measures aimed at the control of residues and contaminants in animal products to assess whether these systems offer adequate assurance that the products are within the specified residue limits laid down in EU legislation. Attention was paid to examining the implementation of corrective actions promised in response to recommendations made in the FVO residue mission report and adherence to the standards laid down in the Council Directive 96/23/EC. The audit report concluded that the recommendation related to formaldehyde was followed by the competent authority, which is the EIC. Further, the report highlighted that the sample testing procedures, etc. complied with the requirements laid under the Council Directive 96/23/EC.

A study by FAO[133] also points out to the importance of recognition of export certification systems in the case of trade in dairy products. The study suggests that export certification systems should be built up to also include standards like GAP and HACCP. However, there are several concerns related to export certification system due to which its implementation in the dairy sector is becoming an issue. These are discussed in Section 6.4.

There are some key issues faced in export of dairy products from India to the EU. India has been identified as one of the third countries with risk of FMD and, therefore, import conditions for milk products are rigid for India. For example, imports will be allowed only if such dairy products have undergone, or been produced from raw milk that has undergone, heat treatment involving a sterilisation process, ultra high temperature (UHT) treatment and various high temperature short-time pasteurisation treatments (HTST).[134]

In the context of exports from India, companies that are interested in exporting processed milk and milk products to the EU have to get their units inspected and approved by the EIC. Products of animal origin require a separate health certificate and health attestation. While there are random checks for all the other categories of food products at EU ports, there is a prescribed level of check for products of animal origin in countries such as the UK.[135]

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131 Until it has been demonstrated that this measure does not affect the analytical result. See Recommendation Number 7, Page 29 of the Food and Veterinary Office (FVO) residue mission report accessible at http://admin.indiaenvironmentportal.org.in/files/FVO%20Final%20Report%20India%20September2009%5B1%5D.pdf (accessed on 11 April, 2017)

132 The report is accessible at http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=2737 (accessed on 11 April, 2017).

133 For details see http://www.fao.org/docrep/meeting/008/y5871e/y5871e0m.htm (accessed on 12 April, 2017)

134 Source: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:175:0001:0024:EN:PDF (accessed on 7 October, 2016)

135 The various Council Directives by the EU on rules and regulations that have to be followed to produce and trade in products of animal origin with the EU are given on http://ec.europa.eu/food/animals/animalproducts/milk/index_en.htm (accessed on 5 October, 2016)

To some extent, India has been able to harmonise certain standards with international standards such as the Codex Alimentarius and the standards of OIE in the case of milk products. Discussions with the NDDB highlight that India has already achieved compliance with the Codex standards with respect to Code of Practice for the Prevention and Reduction of Lead Contamination in Foods and aflatoxin M1. Yet, there are still differences across the other standards that have been followed in India and those that are prescribed by Codex Alimentarius.

6.3 The Survey Findings

All survey participants and government officials stressed that India is self-sufficient in the production of milk. The surplus milk products such as SMP/WMP are exported to neighbouring countries such as Nepal and Bangladesh.

A difference of opinion emerged during the survey between Indian co-operatives and the large private players regarding dairy trade (especially exports) with the EU. Co-operatives such as the GCMMF, which is exporting to over 55 countries, pointed out that it is not commercially viable for Indian companies to export to the EU as the EU is self-sufficient in milk production and the export requirements are very stringent. Evidence collected during the survey suggest that the co-operatives, along with some private companies, have made a representation to the Indian government to keep milk and milk products out of any trade negotiations with the EU. They have argued that India is self-sufficient in milk production and consumption. The dairy industry is an important source of livelihood for rural families and the co-operative model has helped uplift their economic conditions. Most of the country's milk is produced by small, marginal farmers and landless labourers and it will be difficult for them to export by meeting rigid export standards. Further, it will be difficult for these farmers to compete with large farmers from EU member states, who are highly subsidised.

Compared to this, some of the Indian private sector companies and joint venture players pointed out that they have highly developed dairy plants that adhere to international standards, some of them have foreign collaborations and they are open to increasing dairy trade (especially exports) with the EU. They are confident that their products will sell well in EU markets, given that they are already supplying products to global companies. Moreover, exporting to the EU will bring about quality consciousness and help keep standards in check, and it will also bring credibility to the brand internationally. Some of them have already entered into joint ventures with EU and US based companies. For example, Parag Milk Foods Limited - has entered into a joint venture with the German brand Hochland Deutschland GmbH to import and market its cream cheese brand 'Almette' in India, which will be co-branded as 'Go Almette'. Such joint ventures give Indian companies access to global technology and best practices. Using the same technology and best practices they would like to export to the EU - partnerships with global companies and brands will allow the Indian companies to be a part of the global production network and supply chain. Thus, some private players are keen on a liberal trade environment with the EU and other countries such as Australia, the US and Canada.

Given the large size of the Indian Diaspora in Europe, the US and Canada, there is a large demand for ethnic Indian sweets (like *rasgulla, ras malai*), ready-to-eat food products (such as

palak paneer) and ready-to-cook sweets (such as *gulab jaamun*) that use milk as an ingredient. Indian companies are either exporting or are keen to export these products to the EU market to cater largely to NRIs and the population from other South Asian countries. Within the EU, the UK is the largest market. Other key markets are Italy, Germany and Belgium.

The survey found that most Indian companies, especially private players, import machinery and technology from EU member states such as the Netherlands, Sweden, Italy and Germany.

6.4 Some Concerns

At present, there is no export of milk products such as SMP/WMP to the EU. This is despite the fact that India is the largest producer of milk and India has implemented a fairly robust export inspection regime. The survey also showed that Indian companies are interested in exporting milk-based products such as ethnic sweets and ready-to-eat food products, but are facing a number of SPS issues. The data in the RASFF portal shows that there is one notification of border rejection for butter in Greece in 2008 for not providing a health certificate during 1 January, 2000 to 30 April, 2016. Further, there were 3 notifications in 2007 for *mutter paneer* dish (peas and cottage cheese) and curried spinach and cheese from India due to the presence of bacteria and undeclared substances (soya) in the shipment. [136]

As highlighted in the previous sections, India has undertaken measures to strengthen its export inspection system. Despite the continuing effort, India has experienced a decline in milk exports to not only developed country markets but also to some of its key developing country markets such as Bangladesh. For example, as per the data published by DGFT, in 2015-16, India's export of SMP and other milk and cream powders registered a decline of 66 per cent and 83 per cent respectively, compared to 2014-15. This is a cause for concern.

Some of the key issues in exports to the EU are:

- **Traceability up to the farm**: A key barrier to export is the lack of traceability to the farms. While some private companies have been able to ensure traceability, large Indian co-operatives are unable to ensure traceability. A study by the FAO[137] also highlights that in a large country like India, where farms are of small size and raw materials are procured by processing units or exporters through traders, the concept of traceability is sometimes not possible. There are also concerns related to whether the milk is cow milk, buffalo milk or mixed milk, which has been also been raised by countries such as the US.[138] The EU consumers have preference for cow milk while the survey participants pointed out that most milk producing companies in states like Gujarat and Uttar Pradesh have buffalo milk.
- **EU standards are often more stringent than Codex Standards:** Dairy products are tested for, among other things, pesticides, pathogens, heavy metals, lead and aflatoxins. Indian companies pointed out that India has been able to reach the Codex Alimentarius

[136] Link to the RASFF Portal: https://webgate.ec.europa.eu/rasff-window/portal/ (accessed on 21 September, 2016)
[137] For details see http://www.fao.org/docrep/meeting/008/y5871e/y5871e0m.htm (accessed on 10 April, 2017)
[138] See also, http://dairyknowledge.in/sites/default/files/ch6.pdf (accessed on 10 April, 2017)

standards as far as milk and milk products are concerned. However, there are concerns as the EU has higher standards and keeps revising their standards. For instance, in the case of aflatoxin M1 the limit in the EU is 0.05 ppm, which is more stringent that the prescribed limit under Codex, which is 0.5 ppm. As mentioned earlier, India is at par with the Codex standard in this regard. In the context of trade with the EU, even larger units (especially those sourcing from small farmers and co-operatives) pointed out that it is difficult to achieve the level of compliance demanded by the EU.

In April 2016, through its notification to the WTO's Committee on Sanitary and Phytosanitary Measures[139], the MRL for cymoxanil was reduced from 0.05 mg/kg to 0.01 mg/kg, the MRL for acrinathrin (F) (proposed new residue definition: acrinathrin and its enantiomer (F)) was reduced from 0.05 mg/kg to 0.01 mg/kg, the MRL for bifenthrin (F) (proposed new residue definition: bifenthrin (sum of isomers (F)) was reduced from 0.2 mg/kg to 0.01 mg/kg and the MRL for fluazinam (F) was reduced from 0.05 mg/kg to 0.01 mg/kg. In 2015, the MRL for diethofencarb was reduced from 0.05 mg/kg to 0.01 mg/kg. The survey participants argued that since they have to source milk from small and mid-sized farmers, it becomes difficult if EU constantly changes MRLs to make them more stringent.

- **High risk status in FMD:** During the survey, all companies, irrespective of whether they want to export, are exporting or would not like to export, pointed out that the process of exporting milk and milk based products from India to the EU is complex due to the perceived risk of FMD and consequently rigid regulations. An EC 2008 report[140] concluded that India belongs to the countries with the highest incidence of FMD.
- **Quality Issues**: According to EU requirements, there are several concerns regarding milk product quality controls, residue monitoring controls and hygiene in producing establishments. Animal health related issues also exist for non-heat treated products. An audit of the Commission was undertaken in 2008 and further exchanges of information have taken place since then. According to the 2008 EC audit report, the EU import standards were not met in India, both from the public health and animal health perspectives. However, they also pointed out that India should request an authorisation to export dairy products to the EU to regain access to the EU market.[141]
- **Other issues related to exports:** For exports to the EU there are other requirements related to type of feed to animals. For instance, there are certain chemicals such as chlormequat, which are present in cereals that might be fed to livestock. At present, the MRL permitted by the EU for cattle, sheep and goat milk is 0.6 mg/kg, which is less stringent than the Codex standard, which is 0.5 mg/kg. However, in August 2016, the EFSA proposed that these levels should be revised to include chlormequat and its salt, thus, making it more stringent. In a recent report, the EFSA has recommended setting an MRL ranging from 0.06

139 See https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S005.aspx (accessed on 21 September, 2016)
140 See http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=2038 (accessed on 13 April, 2017)
141 See http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=2038 (accessed on 13 April, 2017)

to 3 mg/kg.[142] If the recommendation is enacted, it is likely to affect the export of dairy products from India to the EU adversely.

Further, there are concerns related to methods of milking (manual versus mechanised). Some survey participants pointed out that in the EU there is a preference for use of mechanised methods of milking cows which is not possible for small farmers with 2-3 cows. In order to recognise the export certification system, some countries require dairy companies to install specific infrastructure such as milking machines for milk production, a large number of change rooms, flake ice machines, etc. This is not always possible in a co-operative farming model as at the primary production level the implementation may not be possible. Since milk is processed before it is exported, such requirements, according to some survey participants, should be applicable at the level of processing and not at the level of primary production of milk.

- **Issues faced by companies exporting milk-based products:** Indian companies that use dairy products as ingredients in the ethnic sweets and ready-to-eat meals have to make sure that the companies from which the ingredients are procured, adhere to the EU requirements and standards (Das, 2008). Only a certain percentage of dairy products is allowed as an ingredient in products such as *palak paneer (*spinach and cottage cheese*).* In order to adhere to EU regulations, producers have to either decrease the dairy component (for example, reduce the *paneer* in *palak paneer*) or substitute ingredients, both of which involve compromising on taste.

  To counter the SPS barriers, the survey found that many exporters are setting manufacturing base in other countries to export processed milk-based ethnic sweets to the EU. For example, in the case of *ras malai*, the patty is made in India and then it is sent to Canada, where milk is added to complete the processing. The product is then exported to the EU. Thus, the value addition is in Canada and the Indian companies have to share their processing techniques with their counterparts in Canada. One of the companies surveyed is planning to open a unit in the EU to overcome this hurdle.

  As in the case of other products, some companies pointed to the variation in test results across laboratories in the EU. Overall the survey participants pointed out that Indian companies have to adhere to much higher standards for exports compared to the domestic market, which should at least be at par with standards set by international bodies.

6.5 The Way Forward

India today is not able to export milk products to the EU, despite the fact that there is demand for milk based ethnic sweets and ready-to-eat milk based products. There is limited scope for exporting milk products such as SMP/WMP to the EU in the near future and the EU market is saturated and offers a highly competitive price for such products. Hence the recommendations

[142] See http://www.europarl.europa.eu/sides/getAllAnswers.do?reference=E-2016-005545&language=EN (accessed on 20 September, 2016)

mostly focus on how to export milk based products like *paneer*, ethnic sweets and Indian ready-to-eat meals. In the context of Indian ethnic sweets, there are no specific international standards and India may push for development of such standards. If India wants to export to the EU, the country has to adhere to the process listed in Box 6.1. All the plants providing the raw material (i.e. the dairies) and using the raw material (which can be an ethnic sweet manufacturer) have to ensure that they are compliant with the EU requirements. It is difficult for India to challenge these requirements in the WTO until India itself reaches the Codex and other internationally approved standards. All the companies that were interviewed said that they follow international standards, namely HACCP standards, as well as the International Organisation for Standardization (ISO) 22000 guidelines.

The survey also found that if India wants to export to the EU, the country needs to strengthen its processing facilities in the dairy sector and ensure traceability to the farm and cattle. Under Operation Flood, the EU has helped India to strengthen its production. Under the EU-India CITD programme, training can be offered to Indian co-operatives and private companies that are interested in exporting to the EU market to improve their milking, milk storage and manufacturing facilities so that the facilities meet EU standards. The survey also found that there are variations in milk processing in terms of hygiene and the EU-India CITD programme can offer training in this regard. There is need for training of farmers, co-operatives, veterinary doctors on cattle feed and how sick animals should be looked after, given that India is a high risk country on ground of certain diseases such as FMD. There is also need for sharing of more information on residue monitoring plan.

There is an urgent need to upgrade to international processing practices. Collaboration with the EU companies and contract manufacturing for EU companies have helped in the past, and it is likely to help Indian companies upgrade their facilities in the dairy sector and meet international standards and best practices. Some private companies have expressed interest to engage in trade with the EU. They are of the opinion that increasing exports to the EU will increase their value addition and increase international recognition of their brands. These companies are able to ensure traceability and implement control over cattle feed as per the EU requirements. Some of them are already entering into foreign collaborations to upgrade their technology and get access to global best practices. They are also establishing manufacturing units in other countries to cater to the EU requirements.

In countries such as Australia, the Department of Agriculture and Water Resources has compiled a business-friendly document for the dairies and industry so that they understand and follow the EU certification requirements in the dairy sector.[143] Such documents are useful for exporters and similar document may be compiled by EIC or APEDA. APEDA may also help in drawing up a *TraceNet* system for exporters of milk products.

An important issue affecting India's export potential adversely in dairy products is that despite several efforts from the relevant government departments, India is not declared free from FMD

[143] See http://www.agriculture.gov.au/SiteCollectionDocuments/aqis/exporting/dairy/goods-for-eu/understanding-certification-requirements-eu.pdf (accessed on 13 April, 2017)

by the OIE. The government of India initiated a location specific FMD Control Programme, after which the FMD outbreak decreased substantially from 879 in 2012 to 109 in 2015.[144] The Ministry of Agriculture and Farmers Welfare has conceived 'FMD Mukta Bharat' programme and have made it a part of the Rashtriya Krishi Vikas Yojana (RKVY) during 2016-17.[145] India can take assistance from the EU in this regard as the government has been planning to increase the scope of this programme. There is also a need for data collection for reporting progress in the WTO. Given that India faces SPS issues in exporting dairy products to the EU, collection and availability of scientific data will enable India to raise its concerns in the Committee on Sanitary and Phytosanitary Measures.[146]

While the government is undertaking corrective action, it is also important to continuously monitor the quality of raw milk and production conditions. For this, scientific research should focus on efficient testing procedures for India. Quality management is also important. GPH based on the HACCP system for milk production and processing should be followed throughout the milk supply chain. [147] These quality management systems are important for improving the exportability of Indian dairy products to markets such as the EU.

Further, depending on the local requirements, different states in India can develop model dairy farms for enabling training, health care for animals and breeding, among other things. In these farms there can be common infrastructure such as mechanised milking facilities which small and mid-sized farmers can use. These concepts are already being adopted in places such as Punjab[148] where the government is inviting private banks for funding such projects. The EU-India CITD programme can also be instrumental in fostering such developments, including the training needs. Efforts should be made to improve the overall environment for dairy sector development in these model farms. Existing studies highlight that the quality of raw milk is determined by feed quality, sanitation, environmental pollution, and the availability of power and clean water. [149] Thus, environment protection agencies should be engaged with the relevant government department and agencies in the dairy sector to ensure a clean environment for dairy development.

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144 See http://pib.nic.in/newsite/PrintRelease.aspx?relid=148556 (accessed on 11 April, 2017)

145 For details see http://timesofindia.indiatimes.com/india/Govt-pledges-foot-mouth-disease-free-India-extends-scheme-to-16-more-states/articleshow/53614701.cms (accessed on 11 April, 2017)

146 Source: WTO Committee on Sanitary and Phytosanitary Measures Document G/SPS/GEN/204/Rev.17 Dated 7 March 2017. Available at http://spsims.wto.org/en/OtherDocuments/Search?DoSearch=True&DocumentSymbol=G%2FSPS%2FGEN%2F204%2FRev.17&DistributionDateFrom=07%2F03%2F2017&DistributionDateTo=07%2F03%2F2017&SubmittingMembers=&SubmittingObservers=&SubmittingObserverOrganizations=&Secretariat=&DevelopmentStatus=&GeographicGroups=&Title=&Keywords=&DocumentTypes= (accessed on 12 April, 2017)

147 Other studies have also pointed this out. For details see http://www.suruchiconsultants.com/pageDownloads/downloads/4_policy%20paper%20on%20export%20of%20dairy%20products.pdf (accessed on 13 April, 2017)

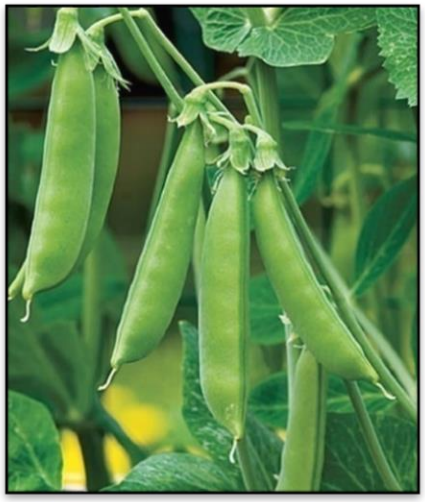
148 http://timesofindia.indiatimes.com/city/chandigarh/amarinder-meets-industry-captains-in-mumbai/articleshow/58117737.cms (accessed on 13 April, 2017)

149 For details see http://www.suruchiconsultants.com/pageDownloads/downloads/4_policy%20paper%20on%20export%20of%20dairy%20products.pdf (accessed on 13 April, 2017)

The NDDB has developed several programmes for traceability and improving productivity. One such programme is the Information Network for Animal Productivity & Health (INAPH) that facilitates traceability in the dairy sector. There has to be a better dissemination of knowledge regarding the programme at the ground level. Dairy farmers have to be sensitised about these techniques and training has to be provided. There can be joint training programmes with the EC for training farmers to facilitate traceability. There is scope for collaboration with similar departments in other countries for research on animal health and improving yield. The programmes are also useful in tracking animal health and therefore, the Ministry of Agriculture and Farmers Welfare should ensure a wider reach of the programme. To conclude, Indian government has renewed its focus on hygienic milk production and marketing and such efforts have to begin at the farm level. Once the issues are addressed at the farm then only there can be exports or India can take up the SPS issue with its trading partners.

Chapter 7: The Case Study of Exports of Green Peas from India to the EU

Both India and the EU are large producers of green peas and most of their production is for the domestic market. Within the EU, France is the world's largest exporter of green peas. Although India is also a key exporter, its exports of green peas to the EU in different forms (such as fresh, frozen and dehydrated) is very low.



Based on in-depth meetings with APEDA, marketing boards such as the MSAMB, Vegetables and Fruit Exporters Association (VAFA), exporters (12 exporters) and processors (4), this case study tries to examine the reasons for low exports and the potential for future exports.

7.1 Overview of Green Peas Production

Green Peas (*Pisum sativum*), also known as garden peas, is cultivated in various regions of the world, including India, in cool climatic conditions. Various varieties of green peas are grown in India such as the Alaska, Lucknow Boniya, Asauji, Early Superb, Arkel, Boneville, T-19, Khapar Kheda, and NP-29, to name a few. Each of these has its own speciality. For example, NP-29 is suitable for dehydration.[150]

Globally, the major green pea producing countries are China, India, Canada, Russia, France and the US (FAO, 2012).[151] The global production of green peas has increased from approximately 12 million MT in 2003 to 17 million MT in 2013. Within this, China was the largest producer of green peas in 2013 with nearly 61 per cent of the share in total world production, followed by India with approximately 23 per cent of the share in world production. The share of the EU in world production of green peas in 2013 was approximately 5 per cent.[152]

Within the EU, France is the largest producer of green peas, and its share in total world production in 2013 was 2 per cent, followed by the UK. However, the production for both France and the UK (and for the EU in general) has been declining, while it has been increasing steadily in China and India. Within the EU, production in Spain has been increasing[153] (Table 7.1). The consumption of green peas in the EU has been rising in recent years and the market is becoming highly competitive.[154]

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150 http://nhb.gov.in/pdf/vegetable/peas/pea011.pdf (accessed on 9 June, 2016)
151 http://plants.usda.gov/plantguide/pdf/pg_pisa6.pdf (accessed on 6 June, 2016)
152 Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 20 October, 2016)
153 Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 19 October, 2016)
154 https://www.cbi.eu/sites/default/files/market_information/researches/product-factsheet-europe-fresh-beans-peas-leguminous-vegtables-2015.pdf (accessed on 10 November, 2016)

Table 7.1: Producers of Green Peas: EU, Selected EU Member States and Other Countries (in MT)

Year	EU	France	UK	Spain	China	India
2003	1306793	420660	399050	55225	6800000	2061800
2004	1222843	364649	315100	69387	7300000	1901200
2005	1168589	359608	312800	54759	7900000	1944800
2006	1192695	351791	299690	77793	8400000	2270000
2007	1102294	337488	238510	73937	8900000	2402000
2008	1283969	349830	364320	75438	9353000	2491000
2009	1651315	664410	400890	91847	9592000	2916000
2010	1459402	570500	372830	83530	9910000	3029400
2011	1266421	258452	424723	85300	10267000	3517000
2012	893061	241154	132500	79500	10500000	3744800
2013	896124	228987	152570	85600	10600000	4006200

Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 19 October, 2016)

Table 7.2 provides data on the productivity, yield and area harvested of green peas in India, which shows that production is increasing.

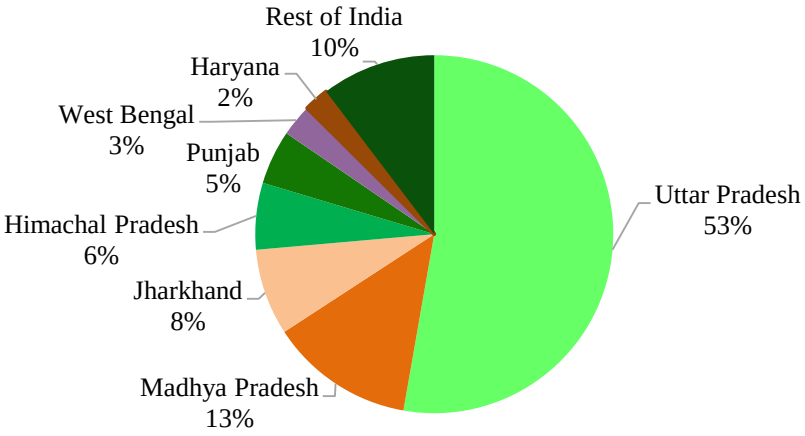
Table 7.2: Productivity, Yield and Area Harvested of Green Peas in India

Year	Area harvested (Ha)	Yield (Kg/Ha)	Production (MT)
2004	285200	66662	1901200
2005	276300	70387	1944800
2006	286100	79343	2270000
2007	297000	80875	2402000
2008	313000	79585	2491000
2009	348000	83793	2916000
2010	364900	83020	3029400
2011	370000	95054	3517000
2012	408200	91739	3744800
2013	420900	95182	4006200

Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 19 October, 2016)

In India, the major pea growing states are Uttar Pradesh, Madhya Pradesh, Jharkhand and Punjab. In 2014-15, Uttar Pradesh alone accounted for more than 50 per cent of India's total pea production. The top 3 states producing peas in India (Uttar Pradesh, Madhya Pradesh and Jharkhand) together accounted for more than 70 per cent of India's total production in 2014-15.

Figure 7.1: Share of Different States in Production of Pea, 2014-2015 (in percentage)



Source: APEDA. Available at http://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?cat=Vegetables&hscode=1082 (accessed on 19 October, 2016)

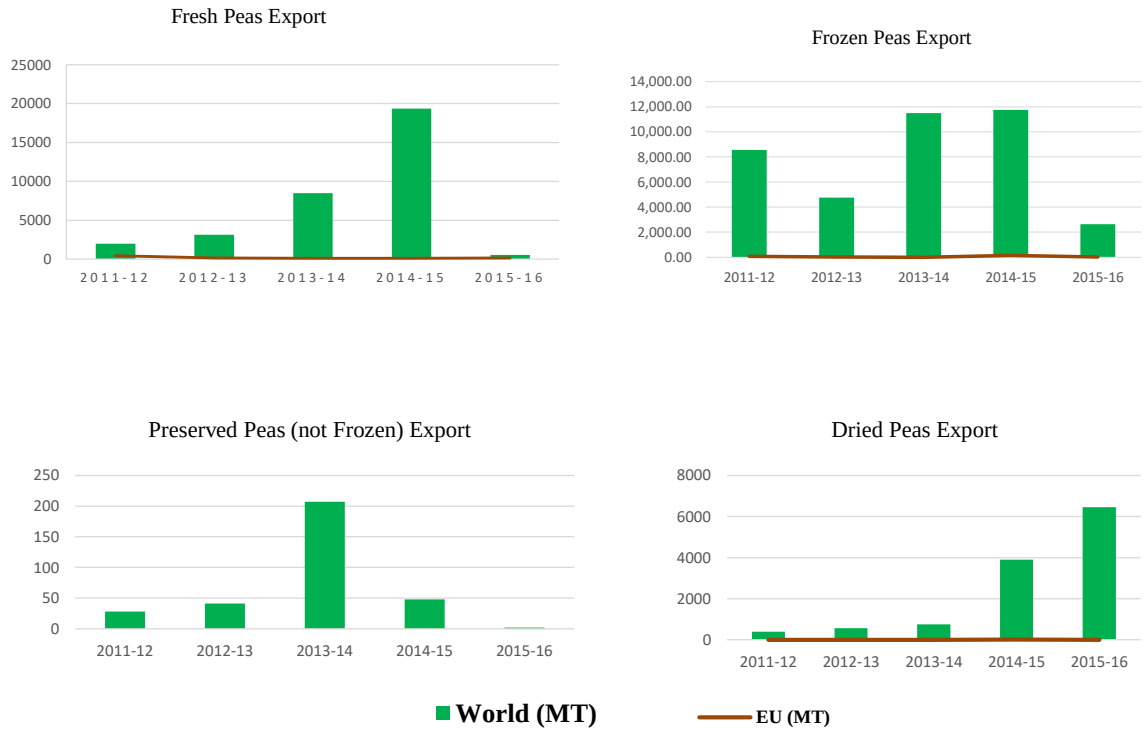
7.2 Export of Peas from India

Peas from India are exported in fresh or chilled form (HS Code: 07081000), frozen form (HS Code: 07102100), dried form (HS Code: 07131000) and preserved/processed (but not frozen) form (HS Code: 20054000).

Although India is a major producer of green peas, its export of green peas to the world is quite low. In 2014-15, out of the total pea production of 4,651,540 MT, only 35,077.67 MT was exported, which is less than one per cent of production.[155] A large part of the exports of dried and shelled peas are to Myanmar, of fresh and chilled shelled and unshelled peas are to Pakistan and Saudi Arabia, of frozen peas to the Middle Eastern countries including Saudi Arabia, Kuwait and the UAE, and of preserved peas to Saudi Arabia and Kuwait. Export of peas to the EU is negligible, and almost zero in the preserved/processed (but not frozen) category. Out of the above mentioned categories, frozen peas account for the largest proportion of export from India to the world.

[155] Source: APEDA (accessed on 20 October, 2016)

Figure 7.1: Export of Various Varieties156 of Peas to the World and to the EU (in MT)



Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx (accessed on 20 October, 2016)

It should also be noted that in 2014, France was the highest exporter of peas (fresh/chilled) to the world. Other EU member states such as the Netherlands and Belgium also had a high export value compared to India.[157] Belgium, the Netherlands and France were also the top importers of peas (fresh/chilled) in the world in 2014.[158] In 2014, India was the largest importer of dried, shelled peas, followed by China.[159]

156 There is no data available on APEDA for the export of preserved peas to the EU.

157 Source: APEDA. Available at http://agriexchange.apeda.gov.in/ProductSearch/Major_Exporing_Countries.aspx?mi=major_exp&hscode=6a%2bynF9I77rbzKjV63vO3xjV7Q6sdPf%2b8NTOnZjzbX6HSgqSGesfhqByGSndivXFYrNl26C6vvU%3d&hscode1=6a%2bynF9I77pgksPQRXzNkR80acT5qOx5waJHOZxJNHdpzvD6Qyfzee5xIQiKAa8%2fprDJZA4Nhqt6%2fvnE2Occd06Y7OluzFyFyJ9l7NeIcVZGBd6EdB4Rp%2fXh4Bc2t%2bg2qlGjYNUa8qo%3d (accessed on 20 October, 2016)

158 Source: APEDA. Available at http://agriexchange.apeda.gov.in/ProductSearch/Major_Imporing_Countries.aspx?mi=major_imp&hscode=6a%2bynF9I77rbzKjV63vO3xjV7Q6sdPf%2b8NTOnZjzbX6HSgqSGesfhqByGSndivXFYrNl26C6vvU%3d&hscode1=6a%2bynF9I77pgksPQRXzNkR80acT5qOx5waJHOZxJNHdpzvD6Qyfzee5xIQiKAa8%2fprDJZA4Nhqt6%2fvnE2Occd06Y7OluzFyFyJ9l7NeIcVZGBd6EdB4Rp%2fXh4Bc2t%2bg2qlGjYNUa8qo%3d (accessed on 20 October, 2016)

159 Source: APEDA. Available at http://agriexchange.apeda.gov.in/ProductSearch/Major_Imporing_Countries.aspx?mi=major_imp&hscode=6a%2bynF9I77ol6qTXdvQ%2b8RM3JRRs7MGd%2fNIACiv1HtVOkXpZjt62Cqyub2Vl%2f3iwM%2bwpk2EPUfY%3d&hscode1=6a%2bynF9I77pgksPQRXzNkR80acT5qOx5U9FYSw4zaSov%2bUAFxvZpasV

It can be seen from Figure 7.2 that fresh peas' exports saw a sudden increase in the year 2014-15, and fell in the year 2015-16. This is due to the fact that fresh pea exports to Pakistan increased from 7457.77 MT in 2013-14 to 18615.04 MT in 2014-15 and became zero in the year 2015-16. This trend is similar to the export of eggplant from India to Pakistan, which suddenly rose in 2013-14 and fell in 2014-15. Dried peas exports from India also saw a sudden rise after 2013-14. This is due to the fact that exports to Sri Lanka and Bangladesh increased substantially in 2014 (although, exports to Bangladesh became zero in 2015-16).

The export of preserved peas from India is very low and its export to the EU is negligible. As in the case of fresh and dried peas, preserved peas exports increased suddenly in 2013-14 due to a rise in exports to the UAE, which fell in 2014-15. Thus, overall, there has been a sporadic rise and a sudden fall in exports to other countries and India does not seem to have a steady export market for green peas.

7.3 Fresh Peas Supply Chain

Figure 7.3 depicts the typical export value chain of fresh peas from India. Fresh peas are grown by a number of small and medium-sized farmers across India. Since the export quantity of peas is small, exporters fill the containers with other vegetables and export it all together.

The survey found that exporters purchase the product from farmers, farmer associations, farmer producer groups or *mandis*. In the survey, exporters pointed out that they prefer to purchase the peas from aggregators, farmer producer groups and *mandis*, because there is wide variation in quality of peas sold, and exporters choose to purchase only products of good quality that are fit for the export market. The *mandis* and aggregators sort the products, which enables exporters to select better quality produce. Working directly with a large number of farmers is costly and time consuming, and farmers tend to charge a higher price for products if they are selling directly to exporters. Since exporters purchase from *mandis* and aggregators, it is difficult to ensure traceability.

The agents, on behalf of exporters, physically sort out the stock and choose the appropriate quality products, and then move on to negotiate the price. Once the price is agreed upon, they purchase the products and further sort it by export destination. For example, the best quality produce is sorted for the EU while some which do not meet EU's quality standards are exported to the Middle East and South Asian countries. Once exporters sort and grade the products, they are then taken to APEDA approved pack houses for further checks. Although fresh peas have to go through phytosanitary checks, APEDA has given procedures for Exports of Vegetables in the report titled "Procedures for Exports of Vegetables".[160] However, it is not mandatory for exporters to follow these.

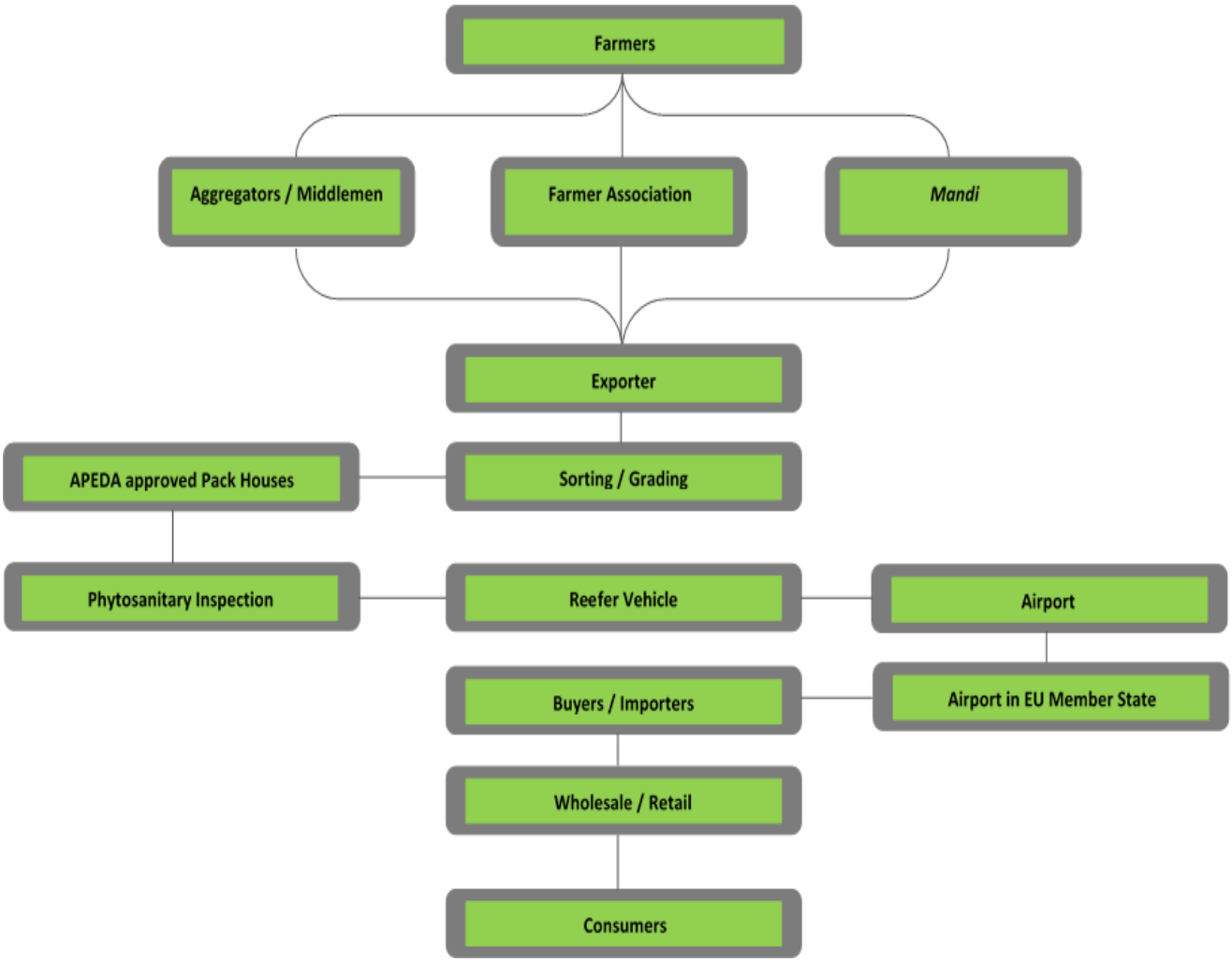
LO%2b8zCDGGvBz9ogF3I4%2frHWS2lFYQm8Fbli23S%2b6h5wuvDTnqybhrHxV%2bWZHnZASdMBgddvUDI6Z8U6b3ZM6XwjSVp%2fdy3w%3d%3d (accessed on 20 October, 2016)

[160] Link to the report: http://apeda.gov.in/apedawebsite/HACCP/procedure-for-ffv-exports-2015.pdf (accessed on 18 October, 2016)

After getting the necessary clearances for exports, the produce is transported in reefer vehicles to the airport – most of the fresh and frozen pea exports go through the air transport mode. The shipments reach EU airports, from where importers/buyers collect them and complete the customs clearances. The peas are then sold to wholesalers or retailers, who in turn sell it to consumers, based on their preference for fresh, frozen or chilled peas.

In the case of processed or frozen peas, the processing is done in India. Most of the companies in the processed food segment that export to the EU have state-of-the-art technology and have also got various certifications from EU bodies such as the BRC and SGS. Some exporters of frozen and chilled peas, such as Taj Frozen Foods India Limited, are also certified by these EU bodies

Figure 7.1: Value Chain in Green Peas for Export to the EU



Source: Compiled by authors from the survey findings

7.4 SPS Issues in Green Peas

The survey showed that Indian exports have not faced any SPS barriers in the EU. This is also substantiated by data in EU's EUROPHYT and RASFF portals. There are zero interceptions on the EUROPHYT portal and no notifications for non-compliance on the RASFF portal for green peas between the year 2005 and September 2016.

Although exporters could not give any information on SPS barriers in green peas, some studies show that green peas in India have faced issues regarding adulteration. A common adulterant in green pea is the Malachite green dye, which is a hazardous substance, used as a colouring agent (Ashok *et al*., 2014) to increase the glow of the pea and make it bright green. It is a dye which has proven to be carcinogenic for humans if consumed over a long period of time (Lakshmi *et al*., 2012). Another adulterant used is argemone seed, which is used to add bulk and weight to the pea.

7.5 The Way Forward

Exporters, APEDA and other exporters' associations such as the VAFA were not aware of any SPS barriers. However, the survey found that there are areas where India and the EU can collaborate to mutually benefit both.

The EU produces superior quality peas and there is scope for improvement in the quality of peas produced in India. In this regard, the EU can share knowledge about good cultivation practices and better varieties of peas. EU representatives can come to India to engage in knowledge sharing with farmers and exporters. India can learn from EU best practices. This can be facilitated under the aegis of the EU-India CITD programme. This will enable India and the EU to partner and venture into new export markets and increase their export potential.

Further, India can acquire better technology to improve the shelf life of products such as dehydrated peas, and better packaging techniques. In India, fresh peas are grown only in one season; however, there is year-round demand. Therefore, India can learn from the EU in terms of storage and packaging techniques.

Chapter 8: Export of Green Beans from India to the EU: Present Status and the Way Forward

Compared to India, the EU is a larger producer of fresh beans. Therefore, the export interest among Indian producers is limited. Yet, there is scope for technical collaboration in the sector as India is one among the top producers of green beans that has not been able to utilise its potential.

For this case study, 12 in-depth interviews were conducted including interviews with 8 exporters, and export promotion councils including APEDA and VAFA.

8.1 Overview of Green Beans Production

Green Bean (*Phaseolus vulgaris*), also known as common bean, snap bean, string bean, field bean etc., is a botanical annual plant of the family Leguminosae, grown for its green pod. It is said to have originated in Central and South America[161] and is now grown worldwide, including in India.

The main commercial varieties of green beans grown in India are the hill varieties (Ooty 1, Ooty (FB) 2, Arka Komal, Premier, Arka Sampoorna, Arka Bold and Arka Karthik) and the plain varieties (Arka Suvidha, Arka Samrudhi, Arka Anoop and Arka Suman).[162] India exports beans to the world in three forms – fresh/chilled form (HS Code: 07082000), frozen form (HS Code: 07102200) and in the mungo form (HS Code: 07133100). The mungo variety has two variants – black lentil (or *urad dal* in India) and green gram or mungo bean. Since both of them are sold under the category of pulses, they are not considered in the case study, which focuses on fruits and vegetables.

Globally, the major green bean producing countries are China, Indonesia, India, Turkey and Thailand.[163] Global production of green beans has increased from approximately 13 million MT in 2003 to 21 million MT in 2013. China had the largest production of green beans in 2013, with a nearly 78 per cent share in total world production, followed by Indonesia with a 4 per cent of share in the world production. India's share of green beans production in the world in

[161] http://eol.org/pages/645324/overview (accessed on 14 June, 2016)
[162] http://agrifarming.in/beans-farming-information (accessed on 15 June, 2016)
[163] http://agriculturejournals.cz/publicFiles/146028.pdf (accessed on 15 June, 2016)

2013 was 3 per cent while the EU's share was approximately 4 per cent.[164] The share of top producers of green beans in the world is given in Table 8.1. The worldwide production of green beans has been increasing steadily; however, production in the EU has fallen.

Table 8.1: Producers of Green Beans: EU, Selected EU Member states and Other Countries (in MT)

Year	World (MT)	China (MT)	Indonesia (MT)	EU (MT)	Turkey (MT)	India (MT)
2003	12902544	8550000	770428	978722	545000	461571
2004	13710731	9280000	829899	974513	582000	382836
2005	15347351	10900000	882254	916205	555000	417249
2006	17180495	12500000	856021	920054	563763	478211
2007	17991906	13450000	867560	895960	519968	513822
2008	18950347	14455000	837892	867987	563056	535722
2009	19086969	14673000	884837	866881	603653	529328
2010	19771119	15157000	942434	745258	587967	586388
2011	20182964	15638100	885474	715875	614948	617869
2012	20949739	16397300	871170	733766	614965	620000
2013	21365919	16661400	881613	774461	632301	620000

Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 21 October, 2016)

Table 8.2 provides data on the productivity and yield of, and area under green beans in India, which shows that production is increasing.

Table 8.2: Productivity, Yield and Area Harvested of Green Beans in India

Year	Area harvested (Ha)	Yield (Kg/Ha)	Production (MT)
2004	155806	24571	382836
2005	168474	24766	417249
2006	182700	26175	478211
2007	189176	27161	513822
2008	196112	27317	535722
2009	194718	27184	529328
2010	209286	28019	586388
2011	218352	28297	617869
2012	220000	28182	620000
2013	220000	28182	620000

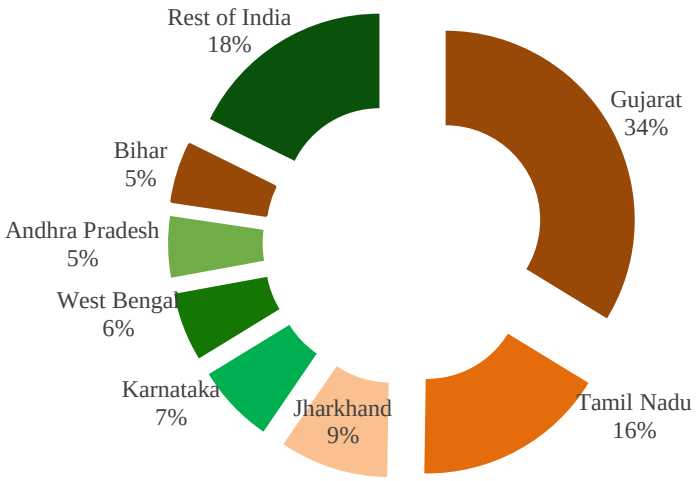
Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 19 October, 2016)

In India, the major bean growing states are Gujarat, Tamil Nadu, West Bengal, Jharkhand and Andhra Pradesh. In 2014-15, Gujarat was the largest producer of beans in India, accounting for nearly 34 per cent of India's total production. The top 3 bean producing states in India (Gujarat, Tamil Nadu and Jharkhand) together accounted for nearly 60 per cent of India's total

[164] Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 21 October, 2016)

production in 2014-15.[165] Figure 8.1 gives the share of various states in India's total bean production.

Figure 8.1: Share of Different States in Production of Beans, 2014-2015 (in percentage)



Source: APEDA. Available at http://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?hscode=1067 (accessed on 21 October, 2016)

8.2 Export of Beans from India

Under this study, two varieties of beans exported from India are considered – beans exported in the fresh or chilled form and beans exported in the frozen form. Compared to India's production, India's export of beans to the world and to the EU is very low. In 2014-15, India's production of beans was approximately 2.2 million MT, out of which approximately 850 MT was exported (which is less than one per cent of production). The top export destinations for green beans from India in 2014-15 were the US and Sri Lanka. India's bean export to the EU in 2014-15 was 20 per cent of the total bean export to the world by India. India exports a larger quantity of frozen green beans compared to fresh/chilled green beans to the world and to the EU.[166]

In the EU, the UK, Germany, Ireland and Belgium are the top importers of Indian beans, although the quantity is very low. Major export destinations of Indian green beans are the South Asian countries (such as Maldives, Sri Lanka and Bangladesh) and countries from the Middle East (such as the UAE and Qatar).

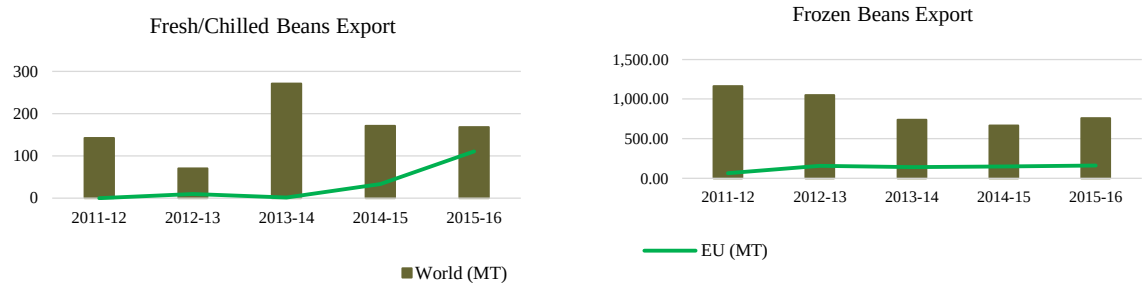
EU member states such as France and the Netherlands are the top exporters of fresh and chilled green beans in the world, and Spain, Belgium and the UK are some of the major importing

[165] Source: APEDA. Available at http://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?hscode=1067 (accessed on 21 October, 2016)

[166] Source: APEDA

countries of fresh and chilled green beans in the world.[167] Uganda and Kenya are the countries from where EU member states primarily import green beans.

Figure 8.1: Export of Various Varieties of Green Beans to the World and to the EU (in MT)



Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 21 October, 2016)

Figure 8.2 shows that export of fresh/chilled green beans from India is lower than the export of frozen beans. The export of fresh/chilled beans to the world has been more or less steady, except when it rose in 2013-14 and fell in 2014-15. The export of fresh/chilled beans to the EU has increased in the past couple of years due to increased exports to the UK and France. On the other hand, the export of frozen beans to the world has fallen since 2011 and its export to the EU increased in 2012 and has remained steady since then.

Overall, it can be seen that the export of green beans in both the varieties is very low compared to production.

Focusing on the EU market, the EU imports fresh green beans from developing countries such as Morocco and Kenya. Countries like Senegal are now growing suppliers of green beans to the EU. France is a large producer of preserved beans within the EU while most imports are through the Netherlands. Kenya has penetrated the UK market for beans rapidly. These developing countries generally provide round the year supply to EU retail chains. Studies show that EU buyers and retailers are becoming increasingly strict on quality and residue levels and they prefer to buy produce from large suppliers, for reasons of supply certainty, product traceability and uniformity.[168]

8.3 Supply Chain for Fresh Beans in India, Exports to the EU and Some Concerns

The supply chain of green beans is similar to green peas and hence, one can refer to Figure 7.3 in Chapter 7. For this case study, in-depth interviews were conducted with 8 exporters. Most

[167] Source: APEDA

[168] https://www.cbi.eu/sites/default/files/market_information/researches/product-factsheet-europe-fresh-beans-peas-leguminous-vegtables-2015.pdf (accessed on 10 November, 2016)

exporters interviewed were large exporters (such as Keventer Agro Limited and Kay Bee Exports), but their green beans export to the EU was low and depended on the requirement of importers. Most of the exports were to the UK and some to other countries like Italy. All exporters have been exporting to the EU since before 2007 (except one, who started exporting a year ago). All exporters interviewed claimed that their consignments had never been prevented from entering the EU, nor have they faced any SPS barriers.

Secondary data also confirmed that there have been no major SPS barriers faced by Indian green beans exporters in the EU. Between 2000 and 2016, there have been only three notifications on the RASFF portal – one in 2009, one in 2012 and one in 2016. All three cases were notified to the EU by the UK. The shipments were detained at UK ports because the beans contained pesticide residues (of methyl and triazophos) higher than the prescribed limits. On the EUROPHYT portal, between 2005 and September 2016, there was one interception in 2014 and one in 2015 for the pest *Lepidoptera* (a fly or a moth).

Except for the above mentioned isolated cases of non-compliance, Indian exporters exporting green beans to the EU have not faced any major SPS barriers.

One important SPS barrier that can arise in the production and export of green beans is adulteration. Just like in green peas, a major export barrier for green beans can be the Malachite green dye, which is added to enhance the green glowing colour of the vegetable. The coloured dye has been proven to be carcinogenic for humans if consumed over a long period of time.[169] While this issue has been detected in some export consignments, these consignments were not for the EU market.

8.4 The Way Forward

India is not a major exporter of green beans to the EU, and the survey participants and APEDA were not aware of any SPS barriers while exporting to the EU.

There are areas where India and the EU could collaborate for mutual benefit. EU's production of green beans is higher and of a better quality than India's. In this context, EU officials can come to India to engage with Indian farmers as well as exporters for knowledge and technology sharing. The EU-India CITD programme can bring together representatives from both regions to raise the production and quality of beans produced in India. This will enable both India and the EU to together venture into new export markets. Further, India can learn from the EU in terms of the latest technologies used for improving the shelf life of green beans such as freezing, freeze-dry technology for dehydrating the product and advanced packaging technologies for ensuring that the products can be stored for longer.

[169] http://www.ijsit.com/admin/ijsit_files/FOOD%20ADULTERATION_1.2.4.pdf (accessed on 8 June, 2016)

Chapter 9: Case Study of Indian Eggplant: A Vegetable that Faced a Ban in the EU

In May 2014, the EU banned import of eggplant from India, along with mango and three other fresh vegetables, namely, snake gourd, bitter gourd and taro, after detecting a high incidence of pests (such as thrips and moths). While the ban on mangoes was lifted in January 2015, the ban on eggplants was lifted on 31 December, 2016.

This case study highlights the issues in eggplant cultivation and exports that led to the ban. It points out ways in which India and the EU can work together to address the problem and how India can learn from the EU's experiences of pest-free eggplant production. It also highlights that it is important for Indian policymakers to focus on safe agriculture and best practices.

The study is based on in-depth interviews with APEDA, marketing boards such as the MSAMB, VAFA, processors, exporters and farmers, to understand the cause of the rampant presence of pests in the crop and the measures taken by them to overcome the problem. In total, 12 interviews were conducted in West Bengal, which is the largest producer of eggplant and Maharashtra (Mumbai and Pune), which is the export hub, with stakeholders engaged in the export of fresh and/or frozen eggplant.

9.1 Production of Eggplant

Eggplant (*Solanum melogena L.*), also known by other names such as brinjal and aubergine, is said to have originated in India and is known to have been cultivated for over 4,000 years. There are approximately 2,500 varieties of eggplant of various shapes extending from oval or egg shaped to long or club shaped; and colours ranging from white, yellow, green, and purple to nearly black,[170] and almost all of these varieties are grown in India. The cultivation of eggplant requires a tropical climate (high rainfall and high temperatures);[171] therefore, it is suitable for cultivation in Asia, Africa and the Mediterranean region. Asia alone accounts for approximately 90 per cent of world eggplant production.[172]

Globally, China is the largest producer of eggplant followed by India. The global production of eggplant has increased from approximately 32 million MT in 2005 to 50 million MT in 2013. China's share in global production was approximately 60 per cent in the year 2013 (with 28.43 million MT production), followed by India with a share of approximately 30 per cent (with 13.44 million MT production). In Europe, Turkey is the largest producer of eggplant, and its

[170] http://www.davidpublishing.com/davidpublishing/Upfile/12/13/2012/2012121309101961.pdf (accessed on 1 June, 2016)
[171] Source: http://203.64.245.61/fulltext_pdf/EB/2001-2010/eb0122.pdf (accessed on 13 October, 2016)
[172] Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 13 October, 2016)

share in world production in 2013 was only two per cent (with 0.82 million MT),[173] followed by Italy. While the overall production in EU, Turkey and Italy are declining, the production in other EU member countries such as Spain and the Netherlands is increasing. However, the rate of increase for India and China has been higher over the years (Table 9.1).

Table 9.1: Producers of Eggplant: EU, Selected EU Member states and Other Countries (in MT)

Year	EU	Turkey	Spain	Netherlands	Italy	China	India
2003	854,358	935,000	175,629	39,000	368,992	16,000,000	7,830,000
2004	882,423	900,000	175,534	41,000	366,461	16,500,000	8,477,300
2005	782,968	930,000	163,783	42,000	338,803	17,000,000	8,600,800
2006	810,339	924,165	167,991	40,000	338,361	17,500,000	9,364,300
2007	776,783	863,737	179,826	41,000	334,966	22,000,000	9,453,000
2008	852,606	813,686	198,768	43,000	321,795	23,722,000	9,678,000
2009	867,334	816,134	207,269	46,000	316,809	25,885,000	10,377,600
2010	809,431	846,998	190,195	46,000	302,551	26,740,000	10,563,000
2011	791,689	821,770	215,769	46,000	243,319	26,507,000	11,896,000
2012	757,209	799,285	245,900	47,000	217,690	27,698,600	12,634,000
2013	722,503	826,941	206,300	48,000	220,153	28,433,500	13,444,000

Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 14 October, 2016)

India grows various varieties of eggplants, including high yielding varieties and hybrid varieties. Most of the superior varieties grown were developed by public sector institutions under the aegis of the ICAR and state agricultural universities. In the past decade, both the area harvested and the production of eggplant has increased (see Table 9.2).

Table 9.2: Area, Production and Productivity of Eggplant in India

Year	Area Harvested (Ha)	Yield (Kg/Ha)	Production (MT)
2005	526,500	163,358	8,600,800
2006	559,700	167,309	9,364,300
2007	568,000	166,426	9,453,000
2008	561,000	172,513	9,678,000
2009	600,300	172,874	10,377,600
2010	612,400	172,485	10,563,000
2011	680,000	174,941	11,896,000
2012	692,000	182,572	12,634,000
2013	722,000	186,205	13,444,000

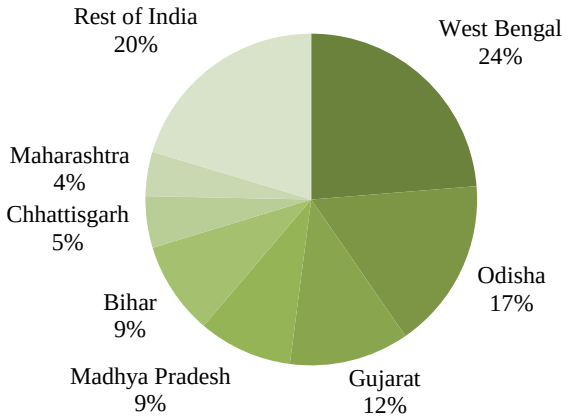
Source: FAOSTAT. Available at http://faostat3.fao.org/download/Q/QC/E (accessed on 14 October, 2016)

Eggplant is grown in almost all parts of India. The major eggplant producing states are West Bengal, Odisha, Gujarat, Madhya Pradesh and Bihar. Figure 9.1 shows that more than 50 per

[173] Source: FAOSTAT. Available at http://faostat3.fao.org/download/Q/QC/E (accessed on 13 October, 2016)

cent of eggplant production in India is concentrated in three states, namely West Bengal, Odisha and Gujarat.

Figure 9.1: Share of Different States in the Production of Eggplant, 2014-2015 (in percentage)



Source: APEDA. Available at http://agriexchange.apeda.gov.in/India%20Production/India_Productions.aspx?hscode=1070 (accessed on 13 October, 2016)

9.2 Export of Eggplant from India

Globally, the top eggplant producing nations are also its major consumers, and this is true for both India and China. Hence, the share of export of eggplants as a percentage of total production for these nations is very low. In 2013, the total production of eggplant in India was 13,444,000 MT[174], of which only 1,883.67 MT[175] was exported, which is less than one per cent. In the case of the EU, the consumption of eggplant has increased over time. EU member states and neighbouring countries such as Turkey produce eggplant. Intra-EU trade accounts for the bulk of EU's trade in eggplant. For example, Germany and France get eggplant from countries such as Spain and the Netherlands. The main countries from which EU imports eggplant include Turkey, Kenya, Dominican Republic and Uganda. In 2013, India and China ranked 27th and 37th respectively among extra-EU countries from which the EU imports eggplant.[176] EU imports more eggplant from ASEAN countries such as Thailand[177] and Malaysia compared to India and China, although their share in global production is very low. It is also important to note that some of these countries have got in experts from EU member countries such as the Netherlands and are able to grow a number of fruits and vegetables that meet EU's standards (see ICRIER, 2015).

The data on exports of fresh and frozen eggplant from India (Table 9.3) show that exports are low except for the year 2013-14, when there was a sudden surge in export to Pakistan. Within

174 Source: FAOSTAT. Available at http://faostat3.fao.org/browse/Q/QC/E (accessed on 13 October, 2016)
175 Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 13 October, 2016)
176 Source: WITS (accessed on 13 October, 2016)
177 Source: WITS (accessed on 13 October, 2016)

the EU, the UK is the main import destination. Table 9.3 also shows that the import destination for Indian eggplant varies. Although India is not able to export fresh eggplant to the EU after the imposition of the ban in the year 2014, there are some exports of frozen and processed eggplant to countries like Spain. This can be attributed to the fact that some Indian exporters (such as Taj Frozen Foods India Limited) are exporting frozen processed eggplant. It was pointed out during the survey that the process of boiling and subsequently freezing the eggplant using modern technology can help eradicate pest infections and related issues.

Table 9.1: Top Importing Nations of Eggplant from India

Country	Qty. 2012-13 (MT)	Qty. 2013-14 (MT)	Qty. 2014-15 (MT)	Qty. 2015-16 (MT)
Qatar	0	0.65	0	6.34
United Arab Emirates (UAE)	2.27	1.68	1.51	3.11
Maldives	0.95	0.2	2.67	2.1
Nepal	0	2.98	0	1
Kuwait	0	0.61	2.73	0.1
Spain	0	0	0	0.04
Canada	0	0	4.84	0
Oman	0	0	0.7	0
Germany	9.46	5.25	0	0
United Kingdom	227.09	52.89	0	0
Hong Kong	0	0	0.92	0
Pakistan	0	1815.62	17.8	0
Russia	0	0	0.09	0
Bahrain	0	0	1.35	0
United States	0	0	15	0
Sweden	19.35	3.8	0	0
Singapore	0	0	6.13	0
Total Exports to the World	**259.16**	**1,883.67**	**53.74**	**12.70**

Source: APEDA. Available at http://agriexchange.apeda.gov.in/indexp/genReport_combined.aspx#content (accessed on 14 October, 2016)

The next section examines the supply chain for eggplant. It also highlights why it is difficult for exporters to have control over the crop, inputs used and farming methodology.

9.3 The Eggplant Supply Chain

Figure 9.2 below depicts the typical export value chain of fresh eggplants. The survey found that eggplant is grown by a large number of small and mid-sized farmers across a number of states in India. The quantity of export is small and often the exporter has to fill in the container with other vegetables like bitter gourd along with eggplant. Before the ban in the EU, eggplants could be exported in both fresh and frozen forms. After the ban, only a small quantity of frozen eggplant is exported.

The survey found that exporters buy the products either from aggregators or *mandis*. Most exporters use both options. It was pointed out by exporters that while making a purchase,

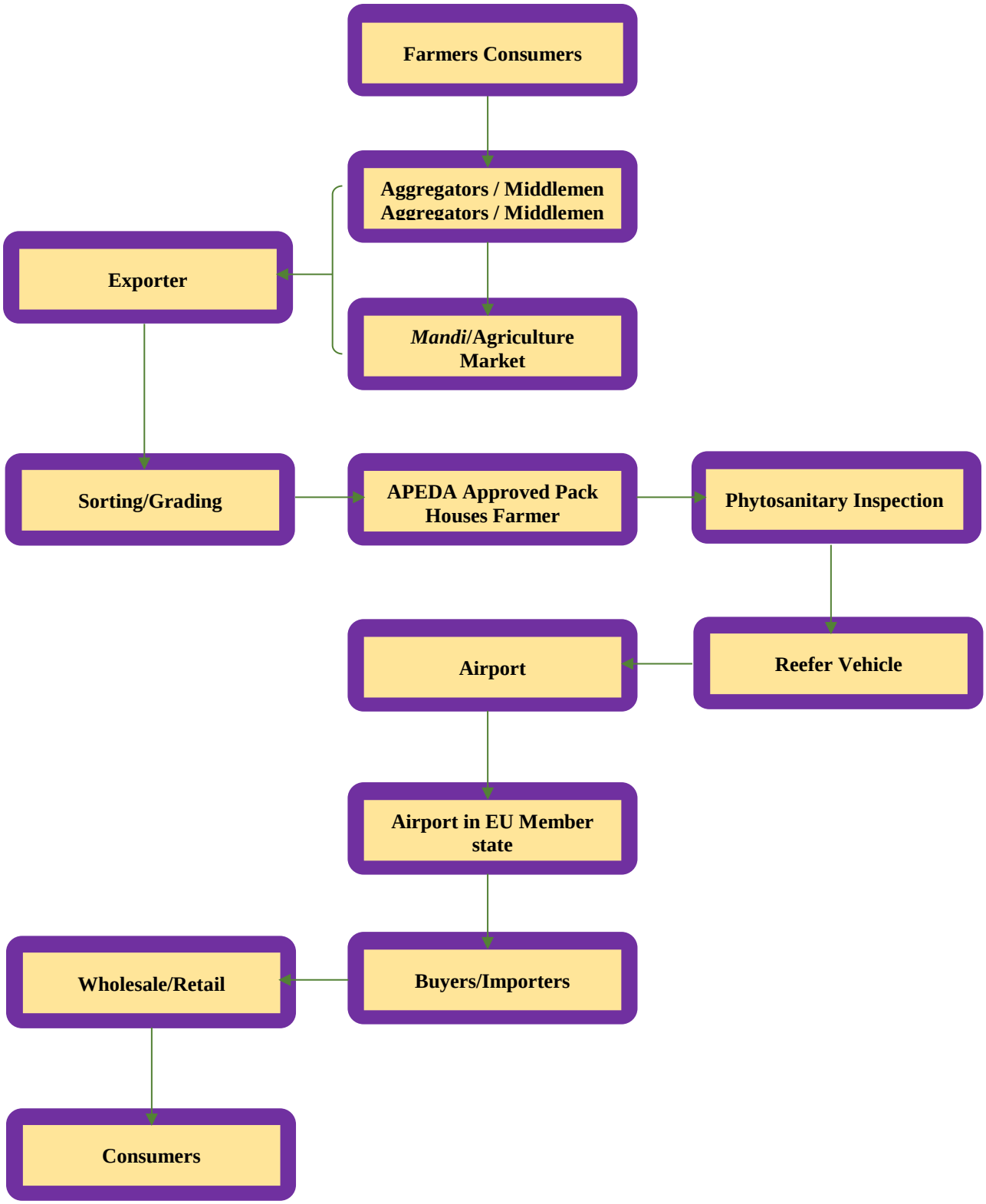
farmers and aggregators charge a premium price if they mention that the product is for export. All exporters pointed out that they would not like to directly source products from farmers because there is wide variation in the quality of the produce and exporters only need superior quality products for export markets. If the exporters source from *mandis* or aggregators, they can selectively buy only the better quality products. Contrarily, if they had to directly source from farmers, they had to work with a large number of farmers (more than 100) at a time, which is difficult and costly. Exporters and their association further argued that if the volume of export is low, it is not financially viable to directly source from farmers and to establish supply chain traceability to farmers, as farm sizes are very small in India.

The exporters or their company agents physically inspect the product with aggregators and in the *mandis*, select the best products and then negotiate the price. Once the price is agreed upon, they purchase the products and further sort it by export destination. For example, the best quality produce is exported to the EU while some, which do not meet EU's quality standards, are exported to the Middle East and South Asian countries. Once exporters sort and grade the product, it is then taken to APEDA approved pack houses for further checks. To meet phytosanitary requirements of importing countries – in this case the EU and its member states – a phytosanitary certificate is issued by the Directorate of Plant Protection, Quarantine and Storage, which can only be issued if the consignment is processed and packed in APEDA approved pack houses and inspected by plant quarantine inspectors. In addition, export consignments are sampled in APEDA approved laboratories for checking the MRLs for agrochemicals to ensure compliance with EU regulations. The vegetables banned in the EU or those that have previously faced problems, namely bitter gourd, brinjal (eggplant), curry leaves, drumstick and green chillies, have to strictly follow this process.

Once the phytosanitary inspection is done and the certificate is issued, the produce is transported in reefer vehicles to the airport; most eggplant exports are through air transport. Shipments are collected by importers/buyers at European airports for customs clearances.

In the case of processed or frozen eggplants, the processing is done in India. Most of the companies in the processed food segment exporting to the EU have state-of-the-art technology and have various certifications from EU bodies such as the BRC and SGS. Some of the exporters of fresh eggplant such as Kay Bee Exports are also certified by these EU bodies.

Figure 9.1: Value Chains in Fresh Eggplant for Export to the EU



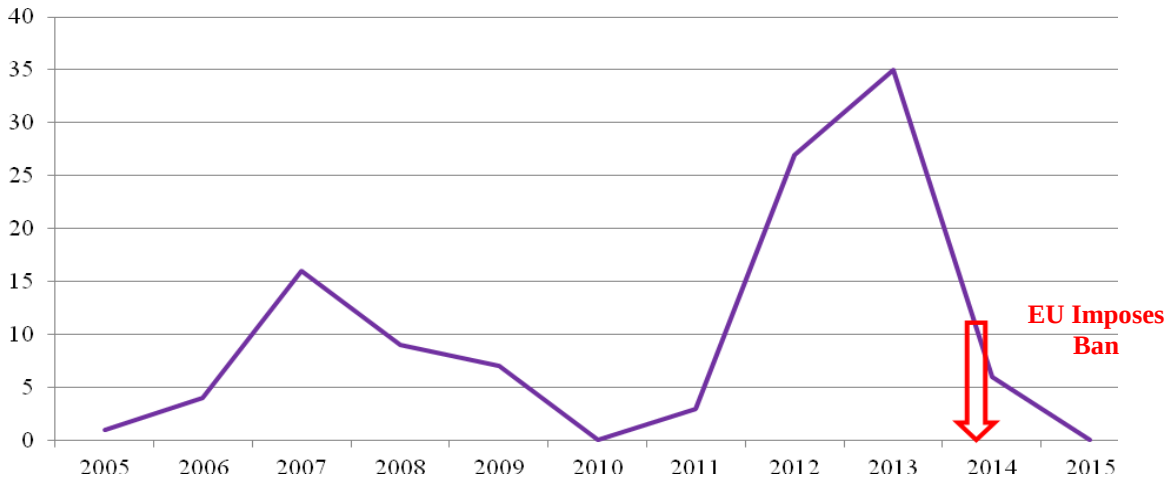
Source: Compiled by authors from the survey findings

9.4 Ban on Export of Eggplant from India

In April 2014, the Standard Committee of Plant Health of the European Commission recommended a ban on the import of eggplant (along with three other vegetables namely, snake gourd, bitter gourd and taro) and mango from India to tackle the issue of shortcomings in phytosanitary certification and high incidence of pests that had increased after 2010. The ban was put in place for imports coming in from May 2014 and was a result of the recommendation of the Standing Committee's meeting on 25-26th March, 2014.[178] The emergency measures were introduced by the European Commission Implementing Decision of 24 April 2014 "On Measures to Prevent the Introduction into and the Spread within the Union of Harmful Organisms as regards Certain Fruits and Vegetables Originating in India" (2014/237/EU).[179]

Between 2005 and 2014, there were 108 interceptions on the EUROPHYT portal for eggplant being exported from India. The consignments were rejected at various EU ports due to the presence of pests such as melon thrips, silverleaf whiteflies, eggplant fruit and shoot borers (EFSB), and moths. Figure 9.3 charts the number of interceptions that were issued for Indian eggplant consignments between 2005 and 2015. The graph shows that the number of interceptions varies across years, but they seems to show a downward trend after 2007 and was zero in 2010. After 2011, there has been a steep increase in the incidence of pests and that led to the ban in the year 2014.

Figure 9.1: Number of Interceptions for Eggplant on the EUROPHYT Portal



Source: EUROPHYT Portal. Available at http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/interceptions/index_en.htm (accessed on 23 September, 2016)

The EC conducted audits in the years 2010, 2013 and 2014 to check into the continued interceptions of harmful organisms in the consignments of eggplant exported from India to the

[178] Summary Report of the Meeting: http://ec.europa.eu/food/plant/docs/sc_plant-health_20140325_sum.pdf (accessed on 17 October, 2016); Agenda of the Meeting: http://ec.europa.eu/food/plant/docs/sc_plant-health_20140325_agenda.pdf (accessed on 17 October, 2016)

[179] http://publications.europa.eu/en/publication-detail/-/publication/e36a4914-5617-4a19-9cb2-57eec3116d7e/language-en (accessed on 13 February, 2017)

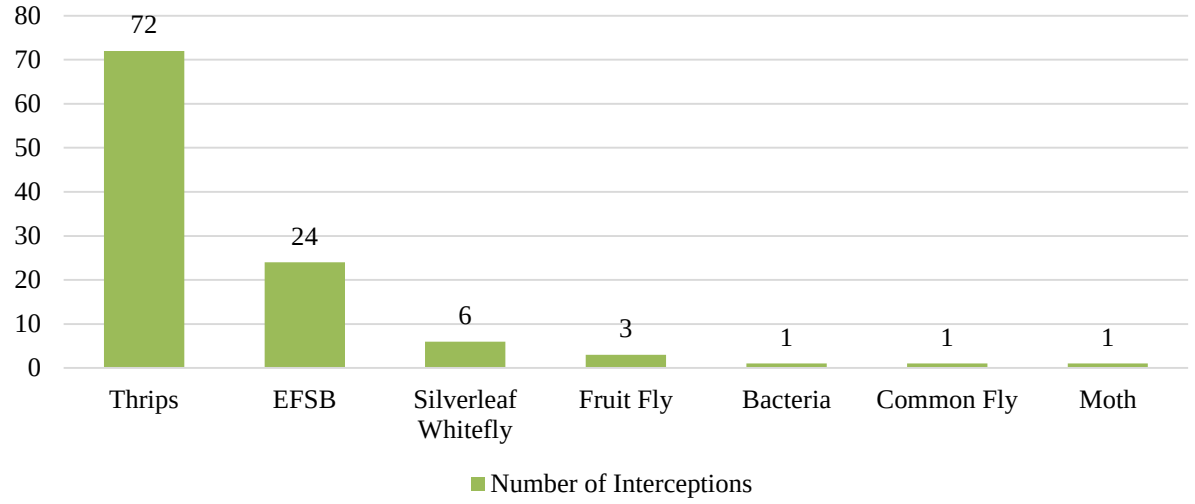
EU, as well as non-compliant wood packaging material (WPM). The audits had taken place to assess the system of phytosanitary tests and regulations that were in place in India. It is interesting to note that, in 2010, since there were zero interceptions for Indian eggplant, the audit cleared exports of Indian eggplant to the EU. The audit of 2013 discovered additional shortcomings with respect to the facilities for export inspections, and the conduct of the checks themselves.[180] This caused several consignments being intercepted on arrival in the EU with quarantine pests, mainly insects like thrips, houseflies, moths and whiteflies. Despite assurances and action taken by India after the 2010 audit, the number of interceptions increased sharply in 2012 and 2013. This led to the ban of imports from India in the year 2014. The EC performed another audit of export controls in September 2014. A continuous review was carried out throughout the whole period of the ban on mango and four vegetables including eggplant and eventually the decision was reviewed in December 2015; this revision lifted the ban on mangoes, but the ban on eggplant and the other vegetables continued to be in place.[181] Later, in October 2016, the EU authorities informed India that emergency measures were reviewed on the basis of information provided by India and there was a decrease in the number of import interceptions. The decrease in the number of interceptions indicated that the phytosanitary export certification system of India had improved. As a result, it was announced that the EC decided not to prolong the emergency measures set out in Decision 2014/237/EU, and the ban was lifted on 31 December 2016.

The analysis of the types of pests that infected eggplant consignments shows that some breeds of pests were more common than others (see Figure 9.4). Different varieties of thrips and EFSB were the most commonly occurring pests. Among the breed of thrips, melon thrips were the most common pests, with 23 notifications between the years 2005-2015.

[180] Source: ec.europa.eu/food/fvo/act_getPDF.cfm?PDF_ID=10719 (accessed on 17 October, 2016)

[181] Source: https://eeas.europa.eu/delegations/india/documents/press_release_eu_stops_some_fruit_and_vegetable_imports_from_india.pdf (accessed on 17 October, 2016)

Figure 9.2: Types of Pests and the Number of Interceptions for Each Type



Source: EUROPHYT Portal. Available at http://ec.europa.eu/food/plant/plant_health_biosecurity/europhyt/interceptions/index_en.htm (accessed on 23 September, 2016)

Box 9.1 shows pictures of two key pests that has affected Indian export consignments. Looking at the picture, it is clear that they do have an adverse effect on food safety and, hence, the issue needs to be addressed whether it is for exports or for domestic consumption.

Box 9.1: Impact of EFSB and Thrips on Eggplants

Melon thrips (shown on the left) and the damage they can cause to the eggplant (shown on the right).

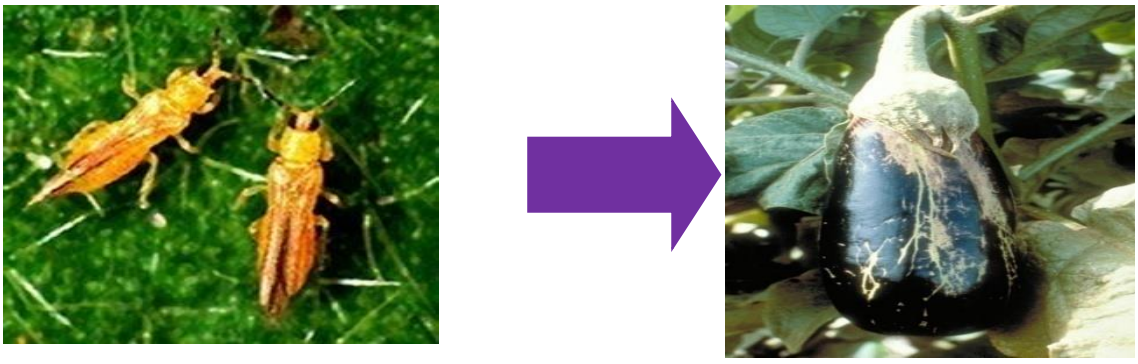


Image sources: https://www.daf.qld.gov.au/plants/health-pests-diseases/a-z-significant/melon-thrips (accessed on 18 October, 2016) (left); https://www.invasive.org/browse/detail.cfm?imgnum=0177010 (accessed on 18 October, 2016) (right)

An eggplant fruit and shoot borer (EFSB) (shown on the left) and damage it can cause to the eggplant (right).

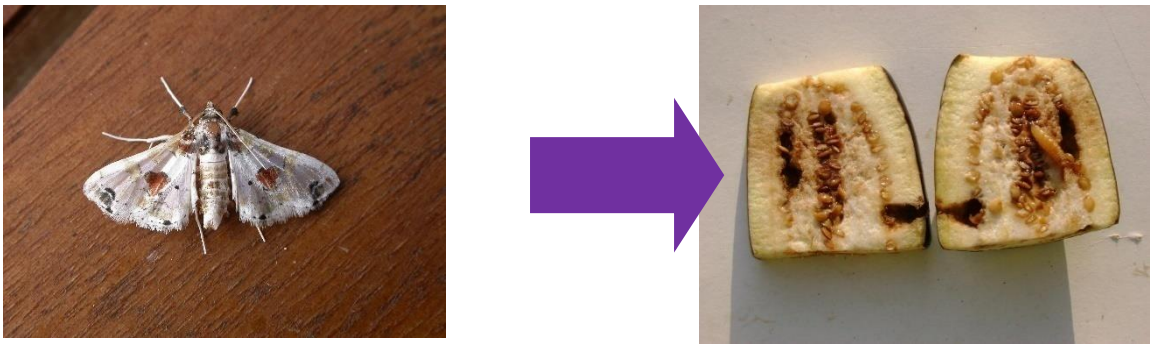


Image sources: https://en.wikipedia.org/wiki/Leucinodes_orbonalis (accessed on 18 October, 2016) (left); http://agropedia.iitk.ac.in/content/brinjal-fruit-and-shoot-borer-leucinodes-orbonalis-pyraustidae-lepidoptera (accessed on 18 October, 2016) (right)

Exporters pointed out that the ban on eggplant was not put into place abruptly. As mentioned earlier, there were audits conducted by the EC's FVO in 2010 and 2013. They further explained that in India, there are numerous pests and mites that affect plant health, and eggplant crops are especially prone to it. A number of studies (for example, see Rahman *et al.*, 2002; Anwar *et al*., 2012 and Krishna *et al*., 2007) also confirm that eggplant produced in Asian countries such as India, Bangladesh, Pakistan and Thailand have a high incidence of pest infestation, which reduces their export potential.

The most common remedy for pest infestation in eggplant has been the use of pesticides. Although the use of pesticides (sometimes beyond the prescribed limit, if the infestation is large) kills the pests effectively, there are chances of there being pesticide residues in the produce. With this, the probability of being rejected in the EU is higher as it has strict MRLs for pesticides used. A study by Medakker *et al*. (2007) found that farmers in South Asia spend about USD 400 per hectare on pesticide, two-thirds of which is used to control the eggplant shoot and fruit borer (ESFB). A number of studies in India (for example, see Srinivasan, 2009)[182] have not only identified the pest that infect eggplant but also provides biological alternatives to chemical pesticides that are used to prevent the pests. The survey participants pointed out that pests can also become resistant to pesticides due to which farmers use larger quantities or other varieties of pesticides, which could also harm human health.

Exporters pointed out that the problem of pest infected crops cannot be solved by exporters or export promotion councils. It has to be solved at the field level by training farmers. This can be done through the state horticulture board and other state government departments. Since the FSSAI has no control over farmers and fresh produce, bad quality produce can be sold in the Indian market this reduces the incentives for farmers to take measures to protect their crops from pest infection, apart from encouraging them to use chemicals. If the central government through the Ministry of Agriculture & Farmers Welfare and state governments focus on safe

[182] Source: http://203.64.245.61/fulltext_pdf/EB/2001-2010/eb0122.pdf (accessed on 18 October, 2016)

agriculture and organic farming, much of the export barriers faced by eggplants can be addressed.

The survey also showed that APEDA had worked with exporters and state governments to address the concerns raised by the EC and had put certain systems in place to ensure that the ban on the remaining vegetables including eggplant was lifted. In 2015, APEDA set up the "Procedures for Exports of Vegetables"[183] (referred to as APEDA, 2015), following the rejection of Indian consignments in export destinations due to the presence of agrochemical residues beyond prescribed limits and due to the incidence of pest infections. This system tries to ensure some traceability of the product to the farm through designated procedures. However, the survey found that traceability did not work in the case of eggplant *vis-à-vis* other products like table grapes. For example, although APEDA has mentioned that the produce "*shall be harvested during the early hours and brought immediately to pack houses recognized by APEDA*"[184], the survey found that this does not happen. Exporters continue to source the products from aggregators and *mandis*. They have started keeping some records of farms through their aggregators or from the *mandis* but these records are not as accurate as in the case of grapes, where there is direct sourcing from farmers.

The survey found that it is extremely difficult to ensure that farms follow uniform pre-harvest practices and that the producing farms are in contiguous areas. Apart from this, there are cases where chemicals and pests seep in from adjoining farms. APEDA (2015) further states that a consignment of vegetables may come in from at least 30 farms, and ensuring that all the farms follow uniform pre-harvest practices and maintains the same pre-harvest interval so that the samples drawn for residue analysis are homogenous is tough.[185] This is also difficult to ensure. Exporters often have to source the best quality from around 100 farms and it is impossible to have them in one location/state. Thus, overall, the traceability to the farm is weaker in the case of vegetables like eggplant compared to fruits such as grapes. In the case of mango, there is some traceability issue related to tracing back to the farms, but the problem of fruit flies has been solved by hot water treatment. Some pests tend to lay eggs and reproduce below the stems and leaves of the eggplant, and exporters have not been successful in eradicating the problem by washing and cleaning the vegetables. None of the exporters could mention any measures that could be taken at the post-harvest stage to eradicate the pests from fresh produce. Some of them did refer to focusing more on the export of processed eggplant.

The Directorate of Plant Protection and Quarantine had issued a "Standard Operating Procedure for Export Inspection and Phytosanitary Certification of Vegetables and Fruits to European Union countries"[186] in March 2015. The list of APEDA approved pack houses are provided to the DG SANTE by the Directorate of Plant Protection, Quarantine and Storage in

[183] Link to the report: http://apeda.gov.in/apedawebsite/HACCP/procedure-for-ffv-exports-2015.pdf (accessed on 18 October, 2016)

[184] For detail see http://apeda.gov.in/apedawebsite/HACCP/procedure-for-ffv-exports-2015.pdf; Page 2 – Procedure for Export of Vegetables.

[185] See http://apeda.gov.in/apedawebsite/HACCP/procedure-for-ffv-exports-2015.pdf; Page 3, point number 3.10.

[186] Link: http://plantquarantineindia.nic.in/pqispub/pdffiles/revsopexpinseu2015.pdf (accessed on 18 October, 2016)

India and there is a yearly audit of the pack houses. They have also set up a dedicated corridor for fruits and vegetables at airports like the Chhatrapati Shivaji International Airport in Mumbai, known as the green corridor, for faster transportation.

9.5 The Way Forward

The initiatives taken by Indian government agencies such as APEDA and the Directorate of Plant Protection and Quarantine (as mentioned above) are indeed commendable. However, they have not been successful in tackling the core issue of pest infestation, which arises at the field level. This issue, which caused Indian eggplant to be banned in the EU, is yet to be addressed.

Pest infestation has always existed and a popular technique to tackle this has been the use of pesticides and other chemicals. However, excessive use of chemicals compromises crop quality and adversely affects human health. Moreover, the EU has strict regulations regarding pesticide residues/MRLs levels. Therefore, there is need for India to focus more on safe agricultural practices. The farmers are poor and they often lack training. They need help to access the right inputs to eradicate pests. They also need help to develop eggplant varieties that are resistant to pests. In this context, a number of efforts are being made in India through public-private partnerships to help eggplant growers eradicate pests, but they have faced barriers due to policy uncertainty. For example, the Maharashtra Hybrid Seeds Company (MAHYCO), a private company in India, developed a hybrid eggplant containing a gene that provides resistance to EFSB (see Medakker *et al*., 2007 for details). The technology used by this company helps reduce the use of chemical pest control. MAHYCO got the technology for insect free management from Monsanto Company. The technology was then sub-licensed by MAHYCO to public research institutes in India (the Indian Institute of Vegetable Research, Tamil Nadu Agricultural University, and the University of Agricultural Sciences, Dharwad), in Bangladesh (the Bangladesh Agricultural Research Institute), and in the Philippines (the University of Philippines, Los Banos).[187] This hybrid variety of eggplant (known as *Bt* brinjal) was approved for cultivation in October 2009. However, in 2010, due to protests by green activists (such as Greenpeace India), the Indian Ministry of Environment and Forest banned the commercial cultivation of the hybrid variety of eggplant developed by MAHYCO. The report of the Ministry of Environment and Forest highlights some of the concerns related to this initiative, including the role of Monsanto Company. The report also pointed out that the ban would continue until independent scientific studies had established that it would not adversely affect the environment or human health. However, the ban still continues, in spite of India's success in *Bt* cotton and despite the fact that other countries like Bangladesh are now successfully growing *Bt* eggplant, which are exported to Indian states like West Bengal. Even after being one of the largest growers of eggplant in India, the state of West Bengal faces competition from Bangladesh and consumers in West Bengal find the quality of produce from Bangladesh better.

[187] Link to the paper: http://www.iphandbook.org/handbook/chPDFs/ch17/ipHandbook-Ch%2017%2025%20Medakker-Vijayaraghavan%20Eggplants%20in%20India.pdf (accessed on 18 October, 2016)

While there can be arguments in support of or against *Bt*/hybrid crops, which is beyond the scope of this study, this example shows that there can be collaboration with foreign companies in eggplant cultivation if the Government of India has a clear policy. EU companies and research organisations have state-of-the art technology for pest control at the field level for eggplant and other vegetables. There can be public-private partnerships between Indian companies/research organisations and EU-based companies and research organisations related to R&D for pest resistant crops, organic crops and in areas like safe agricultural practices. However, this will need strong support from the government. If there is any food safety, health and environment related concerns, it has to be scientifically examined and proven. The rise in pest infected eggplant exports after the ban in 2014 also highlights that policy decisions may have been hasty without any scientific justification, leading to lower quality of produce. In contrast, countries such as Kenya have successfully adopted safe agricultural practices – they have been able to reduce the incidence of both pests and the use of pesticides to control pests. Today, Kenya exports eggplant to the EU. It is important for organisations like APEDA to study Kenya's success story.

The survey participants pointed out that the EU-India CITD programme offers scope for training and it can be used to train growers and state horticulture department staff. This training is needed in states such as West Bengal, Odisha and Gujarat, which are key eggplant growing states. They also said that APEDA should take initiatives to work with scientific research organisations, the Ministry of Agriculture & Farmers Welfare and state horticulture departments to conduct scientific studies to see the advantages and disadvantages of *Bt* eggplant and understand its export potential. If it has an export market and is pest resistant, then APEDA should work with the Ministry of Agriculture & Farmers Welfare and push for its cultivation for commercial purposes.

The EU is also a producer of eggplant and has technologies and follows best practices to ensure that pest infestation is low and plant health is preserved. There can be partnerships between APEDA and DG SANTE (or other EU counterparts) that would involve training at the farm level and other forms of knowledge sharing.

Certain studies undertaken in India have been made into tackling pests without involving the excessive use of chemicals. Srinivasan (2009) has provided various techniques to manage infestation of many breeds of thrips, flies, etc., that are crop friendly and green. These measures include choosing cultivars that repel insects, using bio-pesticides, setting sticky traps for insects in the fields, following crop rotation, etc. Many such studies are available in the public domain and can be used to train the farmers. Agricultural experts and scientists from India as well as the EU can be brought in to give hands-on training to farmers. Experts from EU member states such as the Netherlands can help India develop training programmes and knowledge sharing initiatives for farmers.

India needs to move towards safe agricultural practices and organic farming. The present government is already lays emphasis on organic farming. The survey found that farmers will need training on bio-alternatives to conventional pest management chemicals for organic farming. Small farmers often find it difficult to buy the net, stick trap, etc., for insects/pests due

to limited finance. Further, states like West Bengal have not amended the APMC Act and farmers are not allowed to directly enter into contract manufacturing. These are some of the policy issues that have to be addressed at the state level.

Finally, it is important for India to realise that the health of its consumers cannot be compromised. Therefore, strict measures should be taken to address the issue of pest infected crops and high pesticide residual levels in crops in the domestic market. Until the domestic market become non-receptive to bad quality produce and strict emphasis is placed on consumer health and food safety standards, India cannot be an exporter of vegetables despite its large production base. It is also important to note that pest control through the right means will reduce crop wastage.

Chapter 10: The Case Study of Indian Peanut Exports to the EU

Although India is a major exporter of peanuts to the world, the share of its exports in the EU market is low and has declined significantly in recent years. This has occurred primarily due to the detection of high levels of aflatoxin in India's consignments. This case study assesses the details of this problem, corrective measures adopted by India and the success of these measures.

The case study involved in-depth interviews with exporters, processors, laboratory scientists, and government institutions such as APEDA, EIC and the Indian Oilseeds and Produce Export Promotion Council (IOPEPC). In total, one-to-one interviews were conducted with 7 exporters and exporters-cum-processors in Gujarat and Maharashtra and a consultation was held with the IOPEC and its members. Meetings were also held with 5 multinational companies, who are using or want to use peanuts as ingredients in their manufacturing process in India.

10.1 Production of Peanuts in India

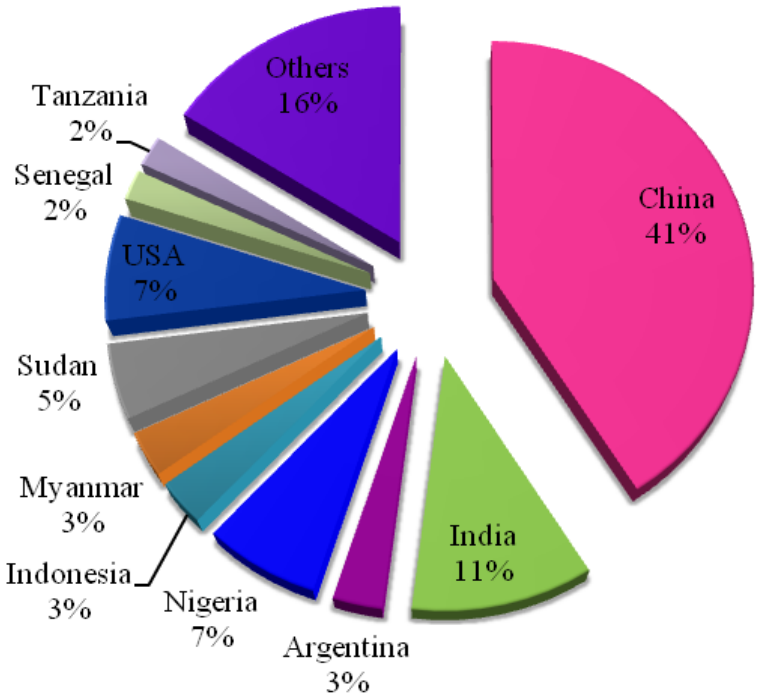
Peanut (also known as groundnut) is a species in the legume or the 'bean' family. Raw peanut is valued for its protein and other mineral content, which is of high nutritional value.

In India, peanuts account for about 30 per cent of total oilseed production (Ministry of Agriculture & Farmers Welfare, 2015). India is the second largest producer of peanuts in the world. It plays a major role in bridging the vegetable oil deficit in the country.

Peanuts in India are available throughout the year due to a two-crop cycle harvested in March and October and are mostly grown under rain-fed conditions. A large quantity is available for exports every year and India is the second largest exporter of peanuts in the world after Argentina. Indian peanuts are of different varieties: Bold or Runner, Java or Spanish and Red Natal, to name a few. The peanut variety of Gujarat (Saurashtra) region is famous globally for its unique flavour, taste and aroma.

India is the world's second largest producer of peanuts after China. Other major producing countries are Nigeria, the US and Argentina. Figure 10.1 shows peanut production shares by country for the year 2015-16.

Figure 10.1: Peanut Production by Country in 2015-16 (in percentage)



Source: Intracen Market Insider - Peanuts Quarterly Bulletin http://www.intracen.org/uploadedFiles/intracen.org/Content/Exporters/Market_Data_and_Information/Market_information/Market_Insider/Edible_Nuts/Peanut%20Quarterly%20Bulletin%20June%202015.pdf (accessed on 7 November, 2016)

Although India leads the world both in area and production of peanuts, its productivity (0.81 MT/hectare) is lower than in countries like China (2.55 MT/hectare), Argentina (1.88 MT/hectare) and the US (3.36 MT/hectare) and the world average of 1.17 MT/hectare for 2013-14 (Madhusudhana, 2013). Studies have shown that the low yield levels can be attributed to cultivation in marginal lands with low inputs, low technology, poor plant population, inadequate fertilisation and lack of plant protection (Madhusudhana, 2013). Further, the processing technology is outdated, which affects the quality of produce.

The top peanut growing states in India are Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, Madhya Pradesh, Odisha and Uttar Pradesh. The Indian peanut processing sector is fragmented and comprises small-scale units with low capacity utilisation. These are mainly located in Gujarat, Rajasthan, Andhra Pradesh and Karnataka. The traditional mechanical crushing industry includes *ghanis* (traditional cold process method for extracting oil) and small-scale expellers. The industry uses processing technologies such as (a) traditional mechanical crushing, or expelling, used for oilseeds with relatively high oil-content; and (b) solvent extraction for processing oilseeds and expeller cake.

10.2 Exports of Peanuts from India and the Export Value Chain

Peanuts are exported in various forms – peanuts in shell, kernels (deshelled) and blanched[188] peanuts (whole or split). These can be used for direct consumption or as ingredients into processing products for human food and bird/animal feed.

India is the second largest exporter of peanuts globally (Table 10.1) after Argentina. The country exported approximately 537,000 MT of peanuts to the world worth INR 40,460 million (EUR 526 million)[189] during the year 2015-16. The main export destinations were Asian countries including Indonesia, Malaysia, Thailand, Philippines and Pakistan. Iran and the UAE from the Middle East are also among the top 10 countries importing Indian peanuts.[190]

Table 10.1: Top Global Exporters of Peanuts (Quantity in '000 MT)

Country	2015-16	2014-15	Growth	Share (%)
Argentina	550	554	-0.72	23.07
India	537	788	-31.85	22.53
USA	390	360	8.33	16.36
China	300	301	-0.33	12.58
Brazil	115	88	30.68	4.82
Senegal	100	53	88.68	4.19
Nicaragua	90	99	-9.09	3.78
Others	302	96	214.58	12.67
Total	**2384**	**2339**	**1.92**	**100**

Source: Data provided by Indian Oilseeds and Produce Export Promotion Council (IOPEPC) during the survey.

India's exports of oilseeds (in general, including peanuts) to the EU have increased since 2001. However, there is a substantial decline in India's export of peanuts to the EU, whose share has declined to about one per cent in recent years from about 12 per cent in 2009.[191] This is mainly because Indian exports have been largely unable to comply with EU food safety and health standards, which is discussed later. Table 10.2 shows that the export of peanuts from India to the EU has declined significantly after the year 2011-12. Although there was a slight improvement in volumes during 2013-14 and 2014-15, they reached a 10-year low of just about 1272 MT in 2015-16.

188 Blanching is the technical term for removing the seed coat from the peanut kernel.
189 Note: Currency Conversion rate: INR 1= EUR 0.013
190 Source: http://apeda.gov.in/apedawebsite/SubHead_Products/Ground_Nut.htm (accessed on 1 June, 2016)
191 http://www.business-standard.com/article/markets/peanut-exports-to-eu-decline-94-on-strict-quality-norms-109092300012_1.html (accessed on 1 June, 2016)

Table 10.2: India's Export of Peanuts to the EU

Year	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Quantity (MT)	5484	13836	15257	5334	14557	15175	2750	3780	4425	1272
Value (EUR million)	1740.31	7.21	8.63	3.47	9.75	13.98	3.19	3.53	4.08	1.33

Source: DGCI&S, APEDA Statistics, http://agriexchange.apeda.gov.in/indexp/18headgenReportmonth_combine.aspx (accessed on 7 November, 2016)

Table 10.3 shows the list of top exporters of peanuts to the EU. India ranks at number four for the major categories of peanut exports to the EU, namely HS 120241 (peanuts, in shell (excluding seed for sowing, roasted or otherwise cooked)) and HS 120242 (peanuts, shelled, whether or not broken (excluding seed for sowing, roasted or otherwise cooked)). To the EU, India mostly exports shelled peanuts.

Table 10.4 shows the top peanut countries in the EU importing from India. In 2015-16, the Netherlands was the top country importing peanuts from India in the EU followed by Croatia and Greece. The shares of countries like the UK, Germany and Belgium were high in the past but have declined significantly recently.

Table 10.3: Top Exporters of Peanut to the EU in Comparison with Exports from India

Category	Top three exporters and India	2014-15	2015-16
		Value ('000 EUR)	
HS 120241 (Peanuts, In Shell (Excl. Seed For Sowing, Roasted Or Otherwise Cooked))	USA	35,257	47,020
	China	28,614	28,532
	Egypt	17,472	20,842
	India	71	69
HS 120242 (Peanuts, Shelled, Whether Or Not Broken (Excl. Seed For Sowing, Roasted Or Otherwise Cooked))	Argentina	3,24,292	4,17,721
	USA	1,42,424	95,952
	China	75,937	79,661
	India	6,379	5,181

Source: Eurostat database. Available at http://ec.europa.eu/eurostat/data/database (accessed on 12 September, 2016)

Table 10.4: Top Indian Peanut Importing Countries in the EU (quantity in MT; values in million EUR)

Country	2013-14		2014-15		2015-16		% share
	Quantity	Value	Quantity	Value	Quantity	Value	2015-16
Netherlands	692.1	0.74	1,257	1.27	261.37	0.32	0.06
Croatia	377	0.36	643	0.61	304	0.30	0.06
Greece	389	0.39	260	0.25	166	0.17	0.03
Lithuania	242	0.20	669	0.60	170	0.17	0.03
Bulgaria	19	0.02	0	0.00	95	0.10	0.02
Estonia	127	0.12	95	0.09	110	0.10	0.02
Germany	380.08	0.34	161.1	0.13	85	0.08	0.02
Belgium	114.04	0.12	2.56	0.00	38	0.05	0.01
Italy	0	0.00	26	0.03	42.67	0.04	0.01
UK	1,306.44	1.12	875.85	0.69	0.1	0.00	0
France	0	0.00	19.78	0.02	0	0.00	0
Ireland	20	0.02	1.02	0.00	0	0.00	0
Latvia	114	0.10	376	0.35	0	0.00	0
Spain	0	0.00	38	0.04	0	0.00	0
Total EU	**3780.66**	**3.53**	**4424.31**	**4.08**	**1272.14**	**1.33**	**0.26**
Total exports (Approx.)	5,09,665	414.41	7,08,386	607.80	5,37,888	525.99	100

Source: Extracted from http://agriexchange.apeda.gov.in/indexp/Product_description_32head.aspx?gcode=0501&value=2 (accessed on 2 November, 2016)

Before we examine the export value chain, it is important to understand the export promotional bodies and regulatory framework for peanut exports in India.

10.3 Export Promotion and Regulatory Structure in the Peanut Sector in India

Peanut and oilseed export is a focus area for the Indian government. The IOPEPC was set up in 1956 under the Ministry of Commerce and Industry as the body responsible for the promotion of oilseed exports including peanuts/groundnuts in India. The council works towards strengthening the domestic supply chain by encouraging farmers, shellers, processors, surveyors and exporters to enhance the quality of peanuts produced and processed in India, and to promote exports.[192]

Since 2015, APEDA has been entrusted with major responsibilities related to export promotion and development of peanuts in India. It issues certificates of export for peanut consignments and approves laboratories for sampling and analysis of consignments. It is also responsible for issuing guidelines for exporting peanuts and peanut products, including registration of peanut units and warehouses. Every exporter has to become a member of APEDA/IOPEPC before getting access to *Peanut.net*.

[192] Source: http://www.iopepc.org/about-us-brief-profile.php (accessed on 2 June, 2016)

Additionally, all consignments of peanuts (feed and food) for export to the EU are required to be sampled and analysed for aflatoxin levels[193] in compliance with EU legislations and accompanied with a health certificate completed and signed by an authorised representative of the competent authority. The EIC, under the Indian Ministry of Commerce and Industry, is responsible for issuing these certificates.

10.4 Procedure for Peanut Exports from India to the EU and the Export Supply Chain

The procedure for peanuts exports from India is standardised. Each consignment of an exporter is normally accompanied by a certificate of export, stuffing certificate and a laboratory test report certifying that aflatoxin levels are within permissible limits. These are issued by APEDA and EIC approved laboratories. The EIC issues the health certificate.

In 2011, APEDA developed a web-based traceability system called *Peanut.net* to ensure controls in the supply chain by facilitating testing and certification of export cargo and to ensure compliance with international standards. *Peanut.net* collects, stores and reports forward and backward traces and quality assurance data entered by the stakeholders, i.e., exporters, laboratories and APEDA within the peanut supply chain in India. It facilitates testing and certification of peanut and peanut products for export from India with standards framed by APEDA and regulations issued by the DGFT, Ministry of Commerce and Industry, on the basis of consultation with exporters. The various processes included under *Peanut.net* are: -

- Registration of peanut processing, shelling and grading units/warehouses by APEDA
- Consignment creation and online application for certificate of export and stuffing certificate by the exporter
- Aflatoxin analysis, generation of test report and issue of stuffing certificate by APEDA recognised laboratories
- Issuance of certificate of export by APEDA
- Issuance of stuffing certificate by recognised laboratories

When exporters decide to send a consignment of peanuts to the EU, they are obliged to encode the consignment quantity in *Peanut.net*. They also select an APEDA approved laboratory to do the necessary testing.

The *Peanut.net* tool automatically calculates the number of samples to be taken and this information is forwarded to the chosen laboratory. The consignment is sampled by designated

[193] Aflatoxins are a group of chemically similar toxic fungal metabolites (mycotoxins) produced by two species of Aspergillus, a fungus which is especially found in areas with hot and humid climates (most common species in Africa and Asia). Depending on the levels, the toxins can severely affect the liver and they are a known human carcinogen. They can occur in foods, such as peanuts, tree nuts, maize, rice, figs and other dried foods, spices and crude vegetable oils, and cocoa beans, as a result of fungal contamination before and after harvest. Several types of aflatoxins are produced in nature. Aflatoxin B1 is the most common in food and amongst the most potent genotoxic and carcinogenic aflatoxins.

laboratory personnel, who deliver the sample to the laboratory. The sample is based on the random sampling technique. Once the sample is taken, the lot is sealed until the analytical results are available. *Peanut.net* is encoded to prevent the issuance of APEDA export certificate if the laboratory results indicate that aflatoxin levels are outside the permitted limit for aflatoxin for the requested destination.

When the laboratory results become available to the exporter/processor, he/she then decides on the final destination of the consignment and applies for a certificate of export with APEDA. The staff of APEDA verify the results and issue the certificate of export. The certificate is issued to the exporter/processor for the quantity that passes the aflatoxin test, stating that the processing and packaging has been carried out in a processing unit/warehouse registered by APEDA with the registration number.

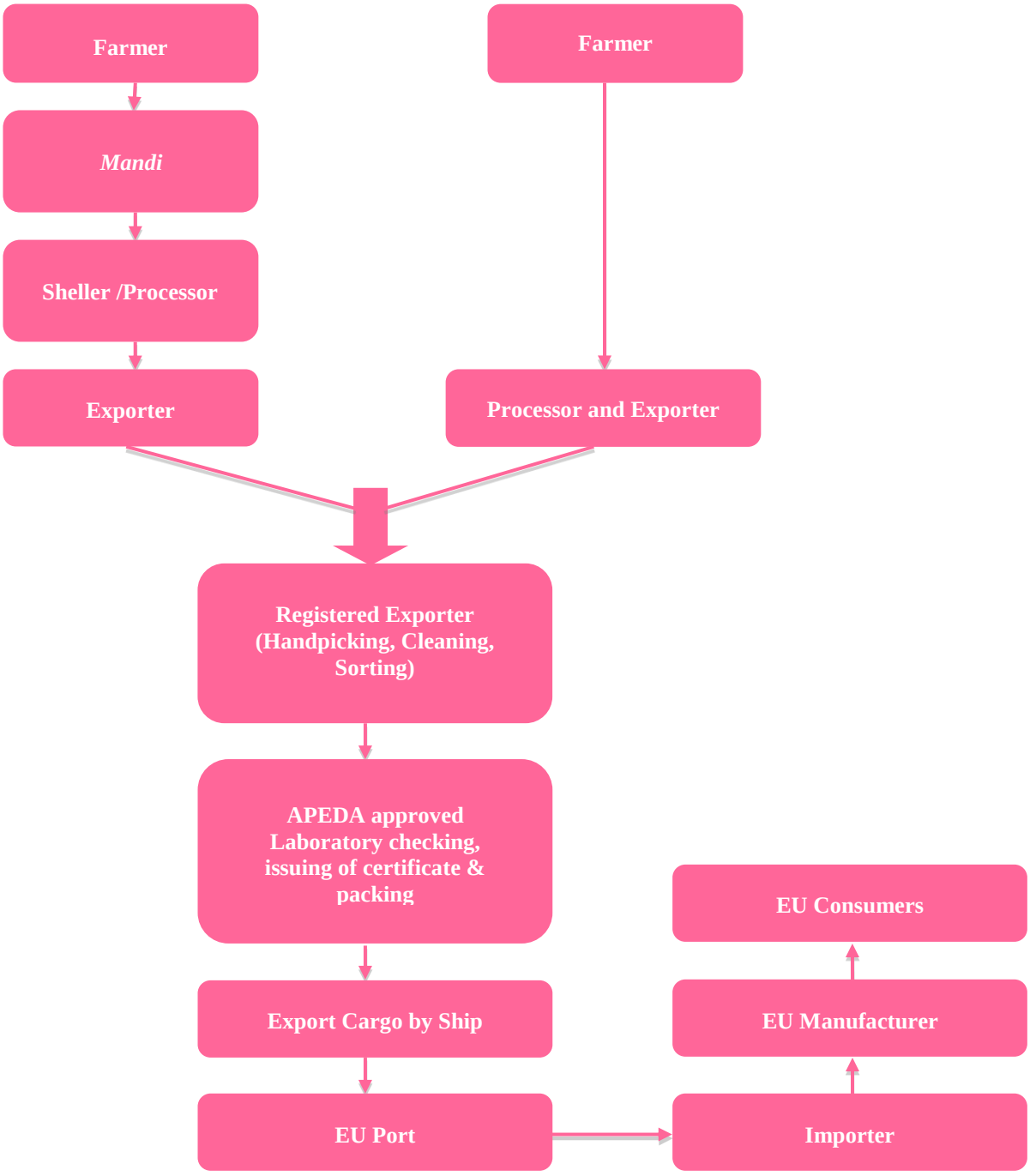
One copy of the certificate of exports is sent to the customs service, one is retained by the FBO, along with the relevant laboratory report. The FBO applies for the health certificate from the EIC online.

The next step is to alert the designated laboratory personnel to return to the premises to release the sealed consignment and witness the stuffing of the container with the appropriate peanut lot numbers. Each bag of the lot is sealed and serially numbered. Thereafter, the laboratory personnel issue a stuffing certificate, which is generated through *Peanut.net*, a number of days after witnessing the stuffing of the container.

Finally, the consignment reaches the customs where customs officials can release the consignment for export to the EU on condition that it is accompanied by the health certificate, which is signed by the EIC designated staff, a certificate of export, a stuffing certificate and the laboratory report.

The processes involved in the peanut/peanut supply chain from India to the EU are given under Figure 10.2. Exporters of peanuts are either farm-owners or processors (shellers) themselves or are purely traders. Farmers sell peanuts in local *mandis* or auction markets in shelled or deshelled form, which are purchased by the exporters' agents. Sorting, cleaning or processing of peanuts is done generally after this stage and sent for inspection at the selected APEDA approved laboratories, after which the certification process by various authorities takes place and the consignment is finally sent for export.

Figure 10.1: Export Supply Chain for Peanuts



Source: Based on inputs received during the survey

10.5 Issues with Exports to the EU

Peanuts can be used for direct human consumption or for use in animal or bird feed. The EU has laid down different MRLs for aflatoxin permitted to be present in peanuts based on whether they are meant for human consumption or animal/bird feed. Peanuts intended for sorting or other physical treatment before human consumption or use as an ingredient in foodstuff have a tolerance limit of 15 µg/kg (parts per billion or ppb) in the EU for all categories of aflatoxins

(sum of B1, B2, G1 and G2) and 8 ppb for category B1 (Table 10.5).[194] This includes application for bird or animal feed. Peanuts and other oilseeds and processed products thereof intended for direct human consumption or for use as an ingredient in foodstuff have a more stringent requirement of 4 ppb for all aflatoxins (sum of B1, B2, G1 and G2) and 2 ppb for aflatoxin B1.[195]

Table 10.1: Aflatoxin Tolerance Limit in the EU (by category)

Foodstuff	Maximum levels (µg/kg)	
	B1	Sum of B1, B2, G1 and G2
Peanuts, to be subjected to sorting, or other physical treatment, before human consumption (can be used as animal or bird feed, or for further processing, but not for direct human consumption) or use as an ingredient in foodstuff with the exception of: peanuts and other oilseeds for crushing for refined vegetable oil production	8.0	15.0
Peanuts and other oilseeds and processed products thereof, intended for direct human consumption or use as an ingredient in foodstuff, with the exception of: crude vegetable oils destined for refining - refined vegetable oils	2.0	4.0

Source: COMMISSION REGULATION (EC) No 1881/2006 of 19 December, 2006 setting maximum levels for certain contaminants in foodstuff, 2006R1881, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02006R1881-20140701&from=EN (accessed on 4 November, 2016)

- ***Issues related to adherence to MRLs:*** The survey found that Indian exporters face difficulties in adhering to these standards as the level of aflatoxin in Indian peanuts is very high. Peanut and peanut products faced a significant number of notifications as is listed in the RASSF portal of the EU. Between 8 March 2004 and 30 April 2016, there were 172 notifications that were raised for peanuts and peanut products (which includes products such as peanut candies, peanut butter, etc.). Around 91 per cent (157 notifications) were for the presence of aflatoxins beyond permissible limits. Among the EU member states, the UK raised the maximum number of notifications, followed by the Netherlands. This is despite the fact that there is a mandatory health certificate requirement for exports. The other key reason for notifications was the absence of a health certificate from the EIC. It was made mandatory for EU-bound export consignments to have this certificate after 2013; yet, the consignments were sent from India without the health certificates.

  Out of 172 notifications, 115 notifications were classified as 'border rejection', which means that the product was refused entry into the EU for reason of a risk to human health and to animal health or to the environment if it concerns feed. The risk category for all

[194] Maximum levels of aflatoxins (aflatoxins B1, B2, G1, G2 and M1) are laid down in Commission Regulation (EC) No. 1881/2006.

[195] This is because sorting or other physical treatments generally make it possible to reduce the aflatoxin content of peanut consignments.

notifications before 2012 was 'undecided', but post-2012, the risk category for most of the notifications was 'serious'.

It is worth mentioning that between the year 2000 and 2004, there were zero RASFF notifications for peanut and peanut products. However, the notifications peaked in 2004 and then again in 2011 and 2012. Subsequent to this, the EIC started issuing the health certificate. Although the number of notifications has reduced, they continue to remain high as shown in Figure 10.3. The survey found that the high occurrence of notifications for certain exporters led them to a situation where they lost their export licence temporarily until the EIC carried out checks to ensure that they were complying with EU standards.[196]

Figure 10.1: Notifications for Peanuts and Peanuts Products on RASFF Portal, Classified by Year

Source: RASSF Portal. Available at https://webgate.ec.europa.eu/rasff-window/portal/?event=SearchForm&cleanSearch=1 (accessed on 4 November, 2016)

The problem of aflatoxin contamination levels in India is serious. Even the permissible limits of aflatoxin in the domestic peanut market, in accordance with the AGMARK standards, are quite high for human consumption, at 30 ppb (B1+B2+G1+G2). Further, since a large part of the peanuts processing industry is in the unorganised/non-corporate sector and is fragmented, it is difficult to implement quality. Some of the processors are of the opinion that "anything can sell in India" since there is lack of implementation of rigid food safety standards at certain levels (for example, in the case of peanuts sold through hawkers). This makes it extremely difficult to ensure a high quality standard for produce in the domestic supply chain. Image 10.1 shows a glimpse of aflatoxin damaged peanuts. High levels of aflatoxin can be harmful for

[196] Causes for export rejections included absence of health certificates, absence of Common Entry Document and parasitic infestation.

health and the survey found that domestic awareness in India is low. A number of European and US multinationals who want to establish processing facilities in India told the survey team that they can only source products from one or two suppliers in India; others are unable to meet quality standards. Multinationals further pointed out that the vast difference in the standards for aflatoxins meant for the domestic and international markets is one the reasons for their reluctance to set up a manufacturing base in India.

The survey found that the issue of aflatoxin arises from poor storage and processing. The problems are two-fold, namely farm and processing related and supply chain related. At the farm and processing level, since the sector is fragmented and most farms and processors are small and medium in size, they find it difficult to control the aflatoxin residue levels. Some processors use water to clean the product, resulting in chances of aflatoxin. There is lack of drying and cleaning technologies. There is also lack of awareness about GAP among farmers and shellers in general.

Image 10.1: Aflatoxin-damaged Peanuts

Image source: https://www.daf.qld.gov.au (accessed on 3 November, 2016)

In the supply chain, some exporters express dissatisfaction with the manner in which sampling is done in the EU. In their opinion, the first layer of a consignment should be removed while taking samples since there is always a chance of moisture getting in when imports first reach the destination. Additionally, exporters contend that there are variations across EU laboratories in the method of checking. These are seen across countries (e.g. Spain and the Netherlands) as well as at specific ports such as the Port of Felixstowe (UK) versus the Port of Rotterdam (the Netherlands). In addition to these, Indian containers are sample tested at the rate of 20 per cent.[197] However, for US consignments, just one in 1000 containers is tested. Indian exporters argue that there should be some kind of equivalence in laboratory testing procedures for aflatoxin. They cited several examples, including the case of a laboratory in the UK, when the sample was soaked overnight for the test.

[197] http://www.s-ge.com/sites/default/files/private_files/2012_EU_legislation_Food_control_0.pdf (accessed on 4 November, 2016)

Indian exporters also contend that the tolerance limits imposed by the EU should be increased. They are of the opinion that under the WTO's SPS Agreement, India should ask the EU to provide scientific justification for the established aflatoxin levels. They also pointed out that India should work closely in this regard with other countries such as the US and Argentina, which export significant volumes to the EU, and their food safety regulations include a limit of 20 µg/kg for total aflatoxins (B1, B2, G1 and G2) in peanuts for human consumption (FAO, 2004).

India, as a member of the Codex Alimentarius Commission, has proposed that the maximum levels for total aflatoxins in ready-to-eat peanuts be set at 10 µg/kg at its 9th session on 'Contaminants in Foods to Propose Maximum Level for Total aflatoxins in Ready-to-eat Peanuts' held in March 2015 in New Delhi. This has been agreed to by many countries of Africa and Latin America. The argument has been that the extent of aflatoxin exposure from peanuts is observed to be relatively low as compared to cereals as the average daily consumption of peanuts is lower across countries/diet clusters. Further, the adoption of the proposed limit would put peanuts in line with the limits set for tree nuts (CAC, 2015a and 2015b).

- ***Unscrupulous activities at the domestic level:*** Some exporters revealed during the survey that various processors and manufacturers indulge in unethical activities such as blanching the peanut incorrectly to save on costs and adding water to peanuts to increase their weight. A few exporters also indulged in practices such as packing up the peanuts before the peanuts were completely dry. Even a little amount of moisture in the peanuts can damage the whole cargo. All these activities contribute to the increased presence of aflatoxins in the produce, which causes shipments to get rejected at EU ports.

- ***Lack of co-ordination between multiple agencies:*** Domestically, exporters are concerned about the problem of co-ordination between multiple authorities that handle the role of issuing certificates, and promotional activities in the sector. The EIC issues the health certificate required by the EU importers, and APEDA and IOPEPC both act as export promotion councils under the Ministry of Commerce and Industry. Some exporters choose to leave the IOPEPC and become APEDA members since they do not want to pay for two separate council memberships. This has caused the IOPEPC to lose a significant amount of funding. IOPEPC representatives feel that since they are involved only in the promotion of oilseeds (unlike APEDA, which has various other products under its purview) and have better contact with the exporters, they are better suited than APEDA to be the sole council looking after peanut exports. A few exporters, on the other hand, feel that APEDA is doing a better job as an export promotion council as compared to IOPEPC.

  It is a burden for exporters also to be associated with multiple peanut export councils. They contend that it is costly (in terms of effort, time consumption and funds) for them to deal with the requirements of registration and other procedures set out by the different organisations, and lack of co-ordination between them exacerbates the problems.

- ***Other factors affecting exports:*** There are several other factors that also adversely affect peanut exports. These include low yields, poor quality of produce and poor transport and handling infrastructure, making it difficult for processors to procure regular supplies throughout the year. Further, poor processing facilities and the unorganised nature of the industry make it difficult to have an organised export supply chain. There is also limited investment in technology (IARI, 2012).

10.6 The Way Forward

The discussions highlight that exports of peanut and peanut products have been facing SPS issues for some time now and the Indian government has implemented various measures such as health certificate by EIC and a traceability system by APEDA to reduce instances of product rejection. Yet, the exports are being rejected on SPS issues, not only in the EU but in other markets such as Indonesia and Vietnam. One of the key issues in this case is why the exports are not able to meet the requirements of the importing countries in spite of a robust export control system. Further, given that the EU-India CITD programme has been in place for some time and still there are SPS issues with respect to exports of peanuts to the EU, Department of Commerce as a nodal agency for export may investigate the cause for the issue, especially why consignments are not adhering to the MRL limits. Further, it is important for the Department of Commerce to work with EIC and APEDA to collect data and ask the EU to provide scientific justification for its aflatoxin tolerance limits.

Given that aflatoxins can accumulate at the field level if the peanut is not completely dry and at the processing level if wrong technology is used, it is necessary to train farmers and processors, and provide them with the technology and knowledge associated with GAP. The EU-India CITD programme can bring together scientists and other experts from the EU and India can learn from EU best practices.

Aflatoxin accumulating fungi can infect peanuts in the production season as well as during post-harvest handling and processing. Pre-harvest contamination is more prevalent in semi-arid tropics such as India, especially when drought occurs just before harvest.[198] Therefore, it is essential to establish adequate controls to minimise the possibility of the presence of aflatoxins in peanuts in excess of prescribed levels. Poor harvesting and storage conditions can lead to rapid development of the fungi and thus, high levels of toxins can be produced.

India has to develop agricultural practices and technologies that can reduce the extent of aflatoxin to permitted levels. While some good practices are acknowledged by state level policymakers, their implementation has been partial. Measures such as crop rotation, advanced sowing, harvesting at an appropriate stage, adoption of proper drying methods, and reducing kernel moisture are recommended to prevent aflatoxin accumulation. Exporters feel that

[198] Drought-stressed plants lose moisture from pods and seeds; physiological activity is greatly reduced. Both factors increase susceptibility to fungal invasion.

adoption of good varieties of seeds and good agricultural practices can help reduce aflatoxin levels to 20 ppb.

According to APEDA, awareness and concern for quality amongst Indian peanut shellers and processors is growing steadily, and multiple sorting and grading is becoming a norm. Indian manufacturers have the capability to prepare and supply edible peanuts conforming to the highest standards.[199] However, unscrupulous practices by some exporters have led to product rejection. Exporters have a different view. They pointed out that best practices should be at the farm, processing and storage levels. In the case of peanuts, it is extremely difficult for exporters to have traceability to each of the small farms and there is need for training and technology at the farm level. They argued that lack of awareness among farmers about recommended good agricultural practices has been a major factor inhibiting the adoption of the recommended practices. Additionally, the tropical climate and drought conditions, along with poor harvesting and storage conditions in the country, exacerbate the aflatoxin problem.

Many exporters in the survey said that the EU's levels for aflatoxins are very stringent compared to the Codex Alimentarius standards and the levels imposed by other developed countries. In this case, not only the Indian Government, but Indian exporters and processors should come together and push the Indian government to raise the issue on WTO's multilateral platform. They can provide the government with scientific evidence and data to substantiate the case. The EU, on its part, must provide scientific data and evidence to back its decision to impose strict aflatoxin limits.

Since the levels of aflatoxin in peanuts for human consumption is more stringent, many Indian traders shifted to bird feed exports wherein the limit is 15 ppb. However, this is not a solution to the aflatoxin problem, whose intensity can increase in future if not tackled in a proper manner.

While importing counties are becoming extremely price competitive and quality conscious, some processors are of the view that "anything can be sold in the domestic market". This disincentivises farmers from investing in best practices as it increases their costs. The FSSAI needs to focus on domestic quality standards for peanuts. If domestic standards are improved, exports will be of good quality. Due to the quality issue, India is not able to develop as a manufacturing hub for peanut processing. Only a few large exporters are able to export to the EU and other countries with strict norms without problems; some of them also own the farms to ensure control over the entire supply chain.

There is need to conduct sensitisation programmes for farmers and consumers to tackle the issue from farm-to-the-plate. Consumer awareness about the harmful effects of aflatoxin contamination can lead to demand for aflatoxin-free (up to permissible limit) peanuts in the market and provide the needed push to farmers and other stakeholders to improve their field and storage level practices. Simultaneously, the Indian FSSAI should reduce the established

[199] http://apeda.gov.in/apedawebsite/SubHead_Products/Ground_Nut.htm (accessed on 1 June, 2016).

aflatoxin limits domestically as well to at least 20 ppb like in the US, and the government should ensure that these are strictly adhered to.

Indian exporters are in a position to trace the product to processors and the area from which the crop is sourced, but they are not able to trace the exact farm from which it is sourced. They pointed out that peanuts sourced from several farms in close vicinity get mixed up. Therefore, APEDA should work with state governments to sensitise farmers. Subsidising proper equipment at the farm level for blanching[200] and better (vacuum) packaging can help in reducing the problem to some extent. There should also be better co-ordination between authorities responsible for ensuring the development of the sector, and other promotional tasks.

Apart from these solutions, the methods of sample testing at various EU port authorities and laboratories should also be looked into and checked for any variations and inconsistencies. The methods should be implemented uniformly for all countries and information should be available in the public domain.

[200] With blanching, the level of aflatoxin decreases but the likelihood of rancidity increases; this may render peanuts brittle and reduce their shelf life. The blanching process includes removing the seed coat from the seed or kernel, and then removing damaged or discoloured seeds from the lot using electronic colour sorters. It needs to be ensured that the equipment used for blanching is of good quality and functional. This is because a breakdown during the blanching process may cause peanut quality losses and enhance aflatoxin formation.

Chapter 11: The Case of Mushroom Exports to the EU

The EU is among the top markets for mushrooms globally. India is building its capacity as a large producer of mushrooms but most of its production is for the domestic market. Although India is also an exporter, its export volumes to the EU are low.

Based on in-depth meetings with exporters and processors (5), this case study examines the reasons for the low exports and assesses the potential for future exports.

11.1 Introduction

Cultivated mushrooms are one of the highest-valued horticultural crops grown in the world. They are consumed in both the fresh and processed forms. Advances in medical research and culinary practices have contributed to increasing demand for fresh mushrooms. Fresh common and specialty mushrooms meet the needs of health-conscious consumers for fat and cholesterol-free, low-sodium foods. Being a rich source of several important nutrients and antioxidants (protein, vitamins, folic acid, iron), they are good alternatives for vegetarians.

Mushrooms can be classified as edible and non-edible. Edible mushrooms comprise a wide variety of species, the most commonly cultivated being the species *Agaricus Bisporus*, commonly known as button or white mushroom.[201] Other varieties include the *Volvariella volvacea* (paddy-straw mushroom), *Pleurotus ostreatus* (oyster mushroom), *Cantharellus cibarius* (Chanterelle), and *Calocybe indica* (milky mushroom).

11.2 Global Production of Mushrooms

The global market for mushrooms was valued at USD 29,427.92 million (EUR 21,953.27 million[202]) in 2013. This market is projected to grow at a CAGR of 9.5 per cent from 2014 to reach USD 50,034.12 million (EUR 45,348.49 million) by 2019.[203] Europe dominated the

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201 http://nhb.gov.in/report_files/Button_Mushroom/BUTTON%20MUSHROOM.htm (accessed on 24 May, 2016)

202 Conversion from USD to EUR done using the average exchange rate for the financial year 2013-2014 from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; EUR 1 = USD 1.34048333

203 http://www.prnewswire.com/news-releases/mushroom-market-by-type-button-shiitake-and-oyster-by-application-fresh-mushrooms-and-processed-mushrooms-dried-frozen-and-canned--by-region---global-trends--forecast-to-2019-300031170.html. Conversion from USD to EUR done using the average exchange rate for the financial year 2015-2016 from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; (accessed on 7 June, 2016) EUR 1 = USD 1.103325

market in 2013, and is projected to be the fastest-growing market for mushrooms between 2014 and 2019, followed by the Asia-Pacific region.[204]

As per the FAO, which provides consolidated data for mushrooms and truffles,[205]India does not feature among the top five producers of mushrooms and truffles in the world (Table 11.1). Button Mushroom (*Agaricus spp*.) is the most popular variety grown and consumed the world over and in India. Other popular varieties produced are oyster mushrooms and milky mushrooms.

Table 11.1: Top Producers of Mushrooms and Truffles in the World, 2013-14

Country	Production (in MT)
China, mainland	7068102
Italy	792000
United States of America	406198
Netherlands	323000
Poland	220000
India	**40000**

Source: FAOSTAT, http://faostat3.fao.org/browse/Q/QC/E (accessed on 16 November, 2016)

11.3 Production of Mushrooms in India

In India, mushrooms have primarily been a non-traditional cash crop grown indoors, as a seasonal crop (winter months – October to April) and under controlled environmental conditions. Button mushroom, the most cultivated variety, is grown in the temperate regions. Oyster, milky, and paddy straw mushroom are cultivated in the tropical and sub-tropical regions.[206] Two to three crops of button mushroom can be harvested per year under controlled conditions, while for seasonal button mushroom, one crop is harvested per year.[207]

Table 11.2 provides data on the production of mushrooms in India between FY 2004-05 and 2013-14. Production of mushrooms was 40,000 MT in 2004-15, which marginally increased to about 41,000 MT in 2010-11 but dropped significantly to reach 17,200 MT in 2013-14. Punjab, Uttarakhand and Haryana are among the top producers of mushrooms in the country. Punjab has been producing the highest volumes in the button and oyster mushroom categories. Production of milky and other mushrooms have been low in all states.

With technological development, the production of button mushrooms, which was earlier limited to the winter season as a non-traditional cash crop, is now being grown almost throughout the year. It is an especially popular option for farmers during the lean season.

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204 http://www.marketsandmarkets.com/PressReleases/mushroom.asp (accessed on 3 June, 2016)

205 Truffles are round, potato-shaped mushrooms with a subterranean habit. http://www.fao.org/docrep/005/y4351e/y4351e0d.htm (accessed on 7 June, 2016).

206 Button mushroom are mostly grown indoors while straw mushrooms are grown outdoors as well. http://nhb.gov.in/report_files/Button_Mushroom/BUTTON%20MUSHROOM.htm

207 http://www.thehindubusinessline.com/todays-paper/tp-others/tp-banking-on-agribiz/a-source-of-additional-income/article2021953.ece (accessed on 7 June, 2016).

There are two types of mushroom growers in India – seasonal and round-the-year growers. Seasonal growers are confined to temperate areas such as Himachal Pradesh, Jammu and Kashmir, the hilly regions of Uttar Pradesh, Tamil Nadu and the North Eastern states. There are also growers in states with a warmer climate such as Uttar Pradesh, Haryana, and Rajasthan (during winter months). Both types of growers cultivate white button mushroom for the domestic market and export. There are a few big companies, but many small and marginal farmers who grow seasonal mushrooms and adopt different technologies.

Table 11.1: All India Production of Mushroom

Year	Production (in '000 MT)
2004-05	40
2005-06	35
2006-07	37
2007-08	37
2008-09	37
2009-10	41
2010-11	41
2011-12	NA
2012-13	NA
2013-14	17

Source: Compiled from Indian Horticulture Database, 2014 accessible at http://nhb.gov.in/area-pro/NHB_Database_2015.pdf (accessed on 17 November, 2016)

Note: NA stands for information not available

Mushrooms are treated before being consumed. This treatment involves drying, freezing and pickling, among others. Fresh mushrooms have a limited shelf life and require canning and other forms of processing to increase shelf life. Over 50 per cent of mushrooms produced in India are sold in fresh form and the rest are processed.[208]

11.4 Export of Mushrooms from India

Until the early 1990s, the Indian contribution to world mushroom trade was minimal. It gathered momentum as the industry became organised with the establishment of large-scale export oriented units. Over the years, successful cultivation of the crop has slowly made it an export-oriented business. India's exports of mushrooms to the world amounted to around EUR 15.52 million (INR 1,121.24 million[209]) in the fiscal year 2015-16.[210] The major export destinations are the US, EU, Switzerland and China.

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208 http://www.dcmsme.gov.in/publications/pmryprof/food/ch2.pdf (accessed on 3 June, 2016)

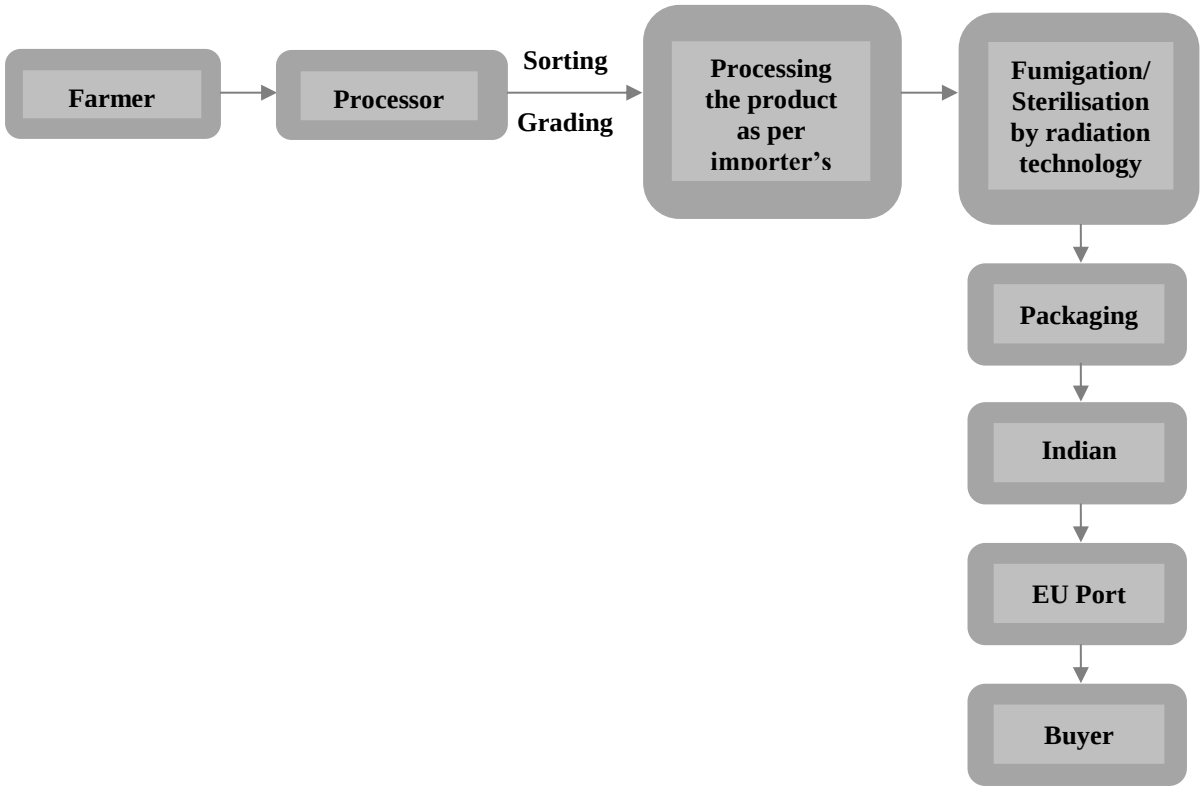
209 Conversion from EUR to INR done using the average exchange rate for the financial year 2015-2016 from http://ec.europa.eu/eurostat/web/exchange-rates/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yFWTDHW2GfRx&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1; (accessed on 7 June, 2016) EUR 1 = INR 72.244725

210 DGFT Export-Import Databank, http://commerce.nic.in/eidb/default.asp (accessed on 21 November, 2016)

Mushrooms can be exported in fresh, dried and preserved form. India's exports are mainly undertaken in the form of preserved and dried mushrooms (HS 7123100 and HS 20031000). Other forms do not have substantial shares in overall exports. Button mushrooms account for most of the exports. Although the current share of India in world exports is less than one per cent, India has great export potential.

The value chain for mushroom exports is given in Figure 11.1. There are two types of exporters – those who own farms, process and export; and those who procure from farmers for processing and exporting. Processing of the product is done as per importers' requirements. Thereafter, it is sent for fumigation/sterilisation using radiation and then it is packed and exported.

Figure 11.1: Export Value Chain for Mushrooms



Source: Based on inputs received during the survey

Processors pointed out that their mushroom production facilities are compliant with the ISO, HAACP and other necessary standards. The exporters are registered with APEDA. All exporters undertake strict quality control in terms of sorting and grading and MRLs related to chemicals (in fertilisers and pesticides) for exporting to markets with standardised requirements such as the EU. The EU importers/buyers provide information about phytosanitary regulations to Indian exporters.

11.5 India's Exports to the EU

Table 11.3 shows mushroom exports from India to the EU. For the period between 2010-11 and 2015-16, India mainly exported preserved and dried mushrooms (HS 7123100 and HS 20031000) to the region. The share of EU countries in India's total export of mushrooms is

significant for these two categories. The category-wise share of EU in India's mushroom exports is shown in Table 11.4 for the years 2014-15 and 2015-16. Within the EU, the major importing countries for Indian mushrooms are France, Italy, Germany and Sweden.

Table 11.1: India's Exports of Mushrooms to EU Countries (Values in INR million)

HS Code	Commodity	2010-2011	2011-2012	2012-13	2013-14	2014-15	2015-16
7095100	Mushrooms Fresh Or Chilled	NA	NA	NA	0.001	NA	0.145
7115100	Mushrooms of Genus Agaricus provisionally preserved	1.165	9.792	3.233	0.007	1.908	NA
7123100	Mushrooms of genus agarigus, dried, whole, cut, sliced, broken	100.49	162.94	76.406	158.50	229.44	190.45
20031000	Mushrooms prepared/preserved	0	6.047	37.762	94.8	428.05	392.96
20039000	Other mushrooms & truffles prepared/preserved	NA	3.901	6.059	NA	NA	NA
Total		**101.66**	**182.68**	**123.46**	**253.31**	**659.39**	**583.56**

Source: DGFT Export-Import Databank, http://commerce.nic.in/eidb/default.asp (accessed 18 on November, 2016)

Note: NA stands for information not available

Table 11.2: EU's Share in India's Export of Mushrooms (in percentage)

HS Code	Commodity	2014-2015	2015-2016
7095100	Mushrooms fresh or chilled	0.00	0.44
7115100	Mushrooms of genus agaricus provisionally preserved	0.04	0.00
7123100	Mushrooms of genus agarigus, dried, whole, cut, sliced, broken	57.87	76.84
20031000	Mushrooms prepared/preserved	43.66	56.17
20039090	Other mushrooms & truffles prepared/preserved	0	0

Source: DGFT Export-Import Databank, http://commerce.nic.in/eidb/default.asp (accessed 18 on November, 2016)

11.6 Issues and the Way Forward

In the past decade (since 2005), there have been no instances of any issues with Indian mushrooms being exported to the EU. This is also confirmed by the fact that no notification has been raised either on the RASFF portal or the EUROPHYT portal. Exporters and processors confirmed that there have been no SPS issues with exports to the EU.

In spite of no issues related to exports, export volumes from India for mushrooms are low in general and the full potential of mushroom cultivation is yet to be realised in the country. Commercial cultivation of mushroom in India is in its initial stages and the supply chain can be strengthened further.

Much of the barriers to high quality mushroom cultivation are related to the domestic market. Domestic marketing channels lack adequate price support and processors face erratic demand and supply. Lack of trained manpower is among the other hurdles in the growth of the industry and it requires specialised skills and knowledge. Knowledge sharing with the EU under the EU-India CITD programme in skill development will help Indian exporters and processors.

Further, India needs to not only adopt high yielding and better quality mushrooms but also different varieties of mushrooms. In this regard, the EU has the knowledge that will benefit Indian producers. The production of mushrooms has to be complemented with sound post-harvest infrastructure. The EU can help India set up such infrastructure under collaborative projects. There is need for co-ordination among Indian and European research organisations and producers to enhance research on new varieties of produce suitable for the Indian climate, and improve processing technology, to lower the use of pesticides and to encourage organic farming. Farmers have to be trained to limit the use of chemical inputs and in new areas such as organic farming of mushrooms. The EU-India CITD programme can help bridge such knowledge gaps in India.

The demand for button mushrooms is fast increasing in international markets and a gap exists between supply and demand. There is need to take advantage of this situation by further encouraging production in India. Mushroom cultivation using good agricultural practices can provide an effective way to harness agricultural waste and convert them into health food and to provide income and employment. India also needs information and processing technology to process mushrooms in brine and for processing mushrooms for export.

Chapter 12: Conclusion and the Way Forward

India is one of the largest producers of a number of agriculture commodities and the EU is one of the largest export markets for India. In 2015-16, India's export of agricultural commodities to the EU was more than five times higher than the EU's export to India. Despite this, existing literature highlights that exports from developing countries such as India face SPS issues in developed country markets including the EU market, which adversely affect exports. It is, therefore, important to understand the ***SPS related barriers faced by India's agricultural exports to key markets, identify the reasons for such barriers and make recommendations on addressing barriers through greater collaboration and knowledge sharing with the EU.*** This report is based on case-studies of selected products and a research methodology based on a survey complemented with literature.

The report shows that there are differences in the case studies with respect to the extent that different products are affected by the EU's SPS measures. There are products (such as mangoes) in which Indian exporters have faced rejections or bans in the EU and other markets (for example, the US and Japan) in the past, but such issues have now been resolved by implementing measures (such as hot water treatment for the EU or gamma irradiation treatment for the US) that are acceptable to the importing countries. For some products such as green peas, green beans and mushrooms, there are hardly any alerts in the RASFF or EUROPHYT portals, but export potential is low. For products like milk and milk-based products, it has been difficult for Indian exporters to access the EU market due to SPS issues. These have been discussed in detail in the respective chapters.

12.1 SPS Barriers in the EU: Where They Arise and Their Impact

The survey found that the EU has higher food safety standards than not only those set by international organisations such as Codex Alimentarius Commission, but for some products such as peanuts, the standards are higher than those set by other developed countries such as the US. There are instances where the EU has frequently revised the MRL on chemical residue levels for various products, which make the imports to the EU more prone to rejections. Frequent changes to MRL lead to an uncertain business environment for exporters. In a number of cases, such as the proposed reduction of MRL of ccc for grapes and MRL of tricyclazole for Basmati rice, the issue has to be addressed at field level by reducing/limiting use of the particular chemical. Specifically, in the case of the proposed reduction in the ccc limits in grapes from 0.05mg/kg to 0.01mg/kg in the year 2016 by the EU, there were doubts about the scientific justification of the revision of the MRL and this issue was raised in by India in the WTO's Committee on Sanitary and Phytosanitary Measures.[211] The EU has now decided to

[211] WTO Committee on Sanitary and Phytosanitary Measures Document G/SPS/GEN/204/Rev.17 Dated 7 March 2017. Available at http://spsims.wto.org/en/OtherDocuments/Search?DoSearch=True&DocumentSymbol=G%2FSPS%2FGEN%2F204%2FRev.17&DistributionDateFrom=07%2F03%2F2017&DistributionDateTo=07%2F03%2F2017&SubmittingMembers=&SubmittingObservers=&SubmittingObserverOrganizations=&Secretariat=&DevelopmentStatus=&GeographicGroups=&Title=&Keywords=&DocumentTypes= (accessed on 12 April, 2017)

maintain the current MRL of 0.05mg/kg in grapes. Similar doubts about scientific justification have also been raised in the case of aflatoxin tolerance limits for peanuts by the survey participants. Thus, there are incidences where measures may have been implemented without strong scientific justification.

The survey found that the product can get contaminated in the supply chain due to poor storage conditions or incorrect processing technologies, among others. A number of studies point towards the aflatoxin contamination in Basmati rice and peanuts in the supply chain as possible reason for SPS barriers and product rejections. These issues are discussed in the respective case studies.

There are concerns raised by the EU on official inspection, testing and residue monitoring procedures. Recently, the EU decided to test up to 50 per cent of India's shrimp consignments for residues such as chloramphenicol and nitrofurans, which was earlier 10 per cent. The EC document states that:

"Indian guarantees on the residues status of aquaculture products rely to a large extent on the additional pre-harvest and pre-export testing programmes in place and these mitigate to a certain extent the long- standing deficiencies in official controls on farms, and in particular, very unsatisfactory official controls on the use of veterinary medicinal products. Nevertheless, the relatively narrow range of substances tested for in those additional programmes weakens the reliability of those guarantees. To date, the recommendations from the inspection report concerning official monitoring of aquaculture farms have not been satisfactorily addressed." [212]

The case studies also highlight that the certain chemicals, pesticides, etc., used in farms can result in SPS barriers and, therefore, they can only be controlled to some extent at the post-harvest and pre-export stage. Further, between January 2011 and March 2017, there were 57 notifications for shrimp on the RASFF portal for the presence of prohibited substances such as nitrofuran and furazolidone, and for the presence of chemicals such as oxytetracycline above the MRL levels, and 33 of these were between January 2014 and March 2017.[213] This is despite the fact that strict export monitoring and control are followed in India for shrimp exports to the EU. Survey participants have questioned that if a produce is going through export inspections why is it rejected in the EU.

The case studies also discussed how these barriers have adversely affected the Indian exporters and farmers, which have resulted in loss of revenue and reduction in shelf-life of products, and in destroying the products/consignment at the EU port of entry. Since issues are product specific, each case study discusses how the specific issues have adversely affected the different stakeholders.

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[212] Extracted from http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016D1774&from=EN (accessed on 10 April, 2017)

[213] Source: https://webgate.ec.europa.eu/rasff-window/portal/?event=searchResultList&StartRow=101 (accessed on 12 April, 2017)

The case studies show that the EU standards apply equally to the EU FBOs as well as to all exporters to the EU. In this context, it is important to note that public awareness and concerns about food safety are rising across the world. There has been an increase in use of risk analysis techniques and a number of developing countries are taking measures to implement more stringent food safety standards. For example, Cambodia banned tricyclazole in March 2017, following the EU's new MRL on the same not only for exports but also for domestic consumption.[214] In some case studies, for example, peanuts and dairy, the survey found that products are not only failing to comply with the EU standards, but the standards in the domestic market are sometimes lower than the international standards such as Codex Alimentarius. Adopting and implementing the international standards in a more stringent manner is likely to reduce the difficulties to comply with EU standards as well.

One of the concerns of the Indian exporters is that they are losing their market share to exports from countries such as Kenya, Uganda and Brazil and Chile, who are able to meet the EU standards. Therefore, SPS issues have to be addressed in the context of a highly globalised and competitive trade environment.

12.2 Addressing the SPS Barriers

The SPS barriers can be addressed in several ways such as by ensuring conformity to the importing country standards, implementing certain processes to meet the importing country requirements, undertaking corrective measures, implementing good agriculture practices, raising the issue in the WTO and discussing the issue bilaterally with the importing country, among others. The case studies show that a number of barriers faced by Indian exporters for products such as mangoes, grapes and eggplant in the EU have been corrected through the extensive efforts of the Indian Department of Commerce and agencies such as APEDA. These are discussed in details below:

- ***Implement Product Traceability:*** The survey found that the most successful way of resolving the issues in the recent years has been establishment of product traceability. The case studies of mangoes, fresh grapes, peanuts and eggplant reflect how product traceability can help to overcome the SPS barriers. The EU is a crucial market for India and all stakeholders (including exporters, farmers, processors, supply chain agents) in the survey have accepted that they have to meet EU import requirements and they are willing to do so by implementing product traceability as laid down by APEDA, at least in the case of certain products such as table grapes and peanuts. A number of exporters and processors are also keen to have a product traceability system for Basmati rice, which is presently not in place.

  There are some issues in implementing product traceability, which may continue to exist. India is a large country with multiple small and mid-sized farmers and, therefore, raw materials are procured from multiple farms and agriculture *mandis*, which make it difficult to ensure product traceability. Further, direct sourcing and contract farming are not allowed in states such as West Bengal, which makes it difficult to have direct links between

[214] Source: http://www.akp.gov.kh/?p=99323 (accessed on 12 April, 2017)

exporters, processors and farmers, and ensure product traceability. Even in states such as Maharashtra, where direct sourcing is allowed, exporters prefer to go through middle men, as individual small farmers are not able to ensure uniform quality of supply and handling products of multiple farmers can be difficult.

- ***Initiate Proactive Measures:*** The case studies show that proactive measures will enable India to counter bans. For example, while mangoes from Pakistan faced significantly more interceptions than Indian mangoes for fruit flies during the same time period, Indian mangoes faced the ban and Pakistani mangoes were not banned. This is because when the EC sent a warning letter to Pakistan, it immediately stopped exporting mangoes and made hot water treatment mandatory. Similar action was taken by India for okra which helped the country to counter a ban. The okra example needs to be repeated when frequent cases of interceptions happen, and in this context APEDA needs to work closely with the state governments for products under its purview.

- ***Implement Good Agriculture Practices (GAP):*** Most developing countries address the SPS issues faced in developed country markets by implementing GAP and reducing the use of chemicals and pesticides. An analysis of the case studies reveals a persistent problem originating at the farm level – the excessive use of pesticides by farmers. The amount of pesticides sprayed on the crop is so significant that gradually pests become resistant to them, causing farmers to spray even larger amounts of chemicals over time, leading to deterioration in plant and soil health. This occurred despite the fact that all the farmers who participated in the survey were aware of GAP. Many chemicals that are globally banned are still available over the counter in India. Specifically, 67 pesticides that have been banned in the US, the EU and other nations are still in use in India.[215] Examples of such pesticides are carbosulfan, chlorpyrifos, endosulfan, and quinalphos. If Indian farmers use these pesticides, they will not be able to exports to countries such as the US, the EU and Japan.

  A number of state government officials pointed out that India should move to safe agriculture and GAP. In some areas and for certain crops, these practices are already followed; in India however, there is need for more hands-on guidance. Initiatives are required at multiple levels. First, chemicals and fertilisers that are banned in other countries should not be used in India. Second, the curriculum in agricultural universities should be updated and students should be imparted with lessons on modern and good agriculture practices that can be applied at the ground level. These have to percolate down to the farm level. Agricultural universities can have farm-level programmes to enable the practical application of knowledge. Third, in sectors such as dairy sector, proper hygiene conditions should be maintained at the farm level to ensure that the milk that reaches co-operatives and private processors is of good quality. Indian government has renewed its focus on hygienic milk production and marketing and such efforts have to begin at the farm level.

  Farmers who were surveyed, irrespective of their farm size, revealed that they would like to move away from the use of chemicals and towards GAP and subsequently towards

[215] Source: http://www.downtoearth.org.in/coverage/pesticide-trap-33914 (accessed on 23 August, 2016)

organic farming as there is greater demand for organic products in large markets such as the EU.. They acknowledge that the export market provides higher price realisation as compared to the domestic market and pest-free organic agriculture products get an even better price. Therefore, they are willing to switch to the use of bio-fertilisers and green inputs, but most of them do not have the knowledge and financial means to make the switch. There is a significant push from the Indian central and state governments to promote organic farming but there is a severe shortage of organic inputs, technology, knowledge and most importantly, funding. Chemical fertilisers are highly subsidised and are available in plenty; in contrast, the availability of bio-chemicals and green inputs is limited and the organic inputs for exports have little (or no) subsidies. Therefore, it is important to have a relook at the subsidy regime and subsidise the right type of inputs and farm practices. All government departments may work together to design a comprehensive policy on safe agriculture and organic farming.

- ***Strengthen Testing Procedures and Follow Global Best Practices:*** In the case of sectors such as milk products and milk-based products, efforts have been put in the right direction to ensure that India has good inspection process for dairy exports. There is a need for research in developing efficient testing procedures for milk products and milk-based products. GPH based on the HACCP system for milk production and processing should be followed throughout the milk supply chain.

- ***Export Infrastructure:*** The survey found that India has been increasingly implementing food safety assurance and management system such as HACCP and the FSSAI has mandated its implementation for all FBOs. This will help exports. Industries are also encouraged to do self-certification.

  Some trading partners such as the EU are insisting on installation of specific infrastructure requirements such as mechanised methods of milking for diary exports, which may be possible for private dairies to abide by but may be difficult for the milk co-operatives to implement, given the large number of small farms. In this context, it is important to identify and prioritise companies which are ready to export and those which need further training and capacity building prior to export. The survey recommended creation of model dairy farms with common infrastructure such as mechanised milking facilities for enabling training, health care for animals and breeding among other things. This will also enable poor farmers to have access to infrastructure and better revenue.

  Certain contaminations such as aflatoxin contamination can occur in the supply chain of products such as Basmati rice and peanuts. Discussions at the WTO highlight that India is of the view that aflatoxin contamination can happen in transit (for example, during storage and transportation), while according to the EU it is possible, through appropriate packaging, storage and shipping conditions, to reduce the environmental conditions conducive to aflatoxin growth (Das, 2008).While the two economies may differ in their views, there is no denial that it is important to strengthen the supply chain. The survey found that infrastructure such as cold storages are not equally spread across all states and there are

severe shortages of pack houses, which can lead to product spoilage and fungus (also see NCCD, 2015).

- ***Need for Data Generation and Data Availability:*** To raise an SPS issue with any trading partner, there is need for data and scientific justification. In India, there is no data of exports from different states. This data has to be collected and analysed. APEDA, through the *TraceNet* system, can create a database consisting of exports from the state, number of farmers and acreage under export, etc., which can be made available on the public domain through the APEDA website. Since agriculture is a state subject, information on how much land is used for cultivation for export, export contribution of each state, export infrastructure in each state, etc., will be particularly beneficial for both policymakers and exporters. Further, in sectors such as dairy sector, India is not declared free from FMD by the OIE. However, the government is continuously making efforts to reduce the incidence of FMD outbreaks. There is a need for collection of data by the relevant authorities capturing the information on FMD outbreaks in the country. This will also help to raise the issue in the WTO and other forums, if it is backed by evidence.

- ***Need for Scientific Research:*** A number of agriculture products that India exports to the EU and other markets are specific to this country. For example, Basmati rice, Alphonso mango and Darjeeling tea. These are premium products and if such products get rejected or banned, *the cos*t of such a ban is high. To prevent it, there is need for scientific research in India to find out methods to address the issues faced by such products in key markets. The research should focus on both short-term and long-term solutions. Such research findings can be used in discussion with the importing countries and also for training and knowledge sharing with the exporters and other stakeholders.

- ***Request for Information and Scientific Justification:*** The case studies show that while information on the SPS measures imposed by the EU is available in the public domain, in some cases the scientific justification for imposing the measure is not clear. It will be beneficial if the EC shares with India the procedures, inspection and testing for certain products like milk products and peanuts, and this information is made available on the EIC and APEDA websites.

- ***Discuss the Issue in the WTO:*** The specific trade concern (STC) raised by India on October 2016, regarding the lowering of MRLs for ccc in table grapes from 0.05mg/kg to 0.01mg/kg and the EU's response to India's concerns confirms that SPS issues can be raised in the WTO. The STCs [216] raised by India (either individually or along with other trading partners) against the EU between since 1995 till 2016 are listed in Table 12.1. Overall, 416 STCs have been raised in the WTO by its member countries (as reported by the WTO's SPS

[216] Source: WTO Committee on Sanitary and Phytosanitary Measures Document G/SPS/GEN/204/Rev.17 Dated 7 March 2017. Available at http://spsims.wto.org/en/OtherDocuments/Search?DoSearch=True&DocumentSymbol=G%2FSPS%2FGEN%2F204%2FRev.17&DistributionDateFrom=07%2F03%2F2017&DistributionDateTo=07%2F03%2F2017&SubmittingMembers=&SubmittingObservers=&SubmittingObserverOrganizations=&Secretariat=&DevelopmentStatus=&GeographicGroups=&Title=&Keywords=&DocumentTypes= (accessed on 12 April, 2017)

Committee on Sanitary and Phytosanitary Measures) and among them only 8 are raised by India against the EU. Given that Indian exports face a number of SPS barriers in the EU, India can raise more concerns in the WTO. Further, the status of 6 out of 8 concerns given as "not reported" (NR), which implies that the current status of the concerns (whether it has been addressed or not addressed) is not known. STC Number 374, which relates to the EU ban on mangoes and certain vegetables from India, was raised by India first in July 2014 and was subsequently raised 6 times between October 2014 and June 2016 and the status is still "not reported".[217] While this issue seems to have been resolved by implementing certain measures and procedures, it has to be reported to the WTO's SPS Committee.

Table 12.1: STCs Raised by India against the EU (either individually or with other WTO members) between 1995 and 2016

Year	STC Number	Description of Measure	Member Maintaining the Measure	Status*	Whether Discussed Again in 2016
1998	39	Maximum levels for certain contaminants (aflatoxins) in foodstuffs	EU	R	No
2001	96	Geographical BSE risk assessment	EU	R	No
2010	300	Regulation (EC) No. 1099/2009[218]	EU	NR	No
2010	306	Maximum residue levels of pesticides	EU	NR	No
2012	335	EU testing of pesticide residues	EU	NR	No
2014	374	EU ban on mangoes and certain vegetables from India	EU	NR	Yes
2014	378	EU withdrawal of equivalence for processed organic products	EU	NR	Yes
2016	412	EU MRLs for bitertanol, tebufenpyrad and chlormequat (G/SPS/N/EU/168)	EU	NR	No

Source: WTO Committee on Sanitary and Phytosanitary Measures Document G/SPS/GEN/204/Rev.17 Dated 7 March 2017. Available at http://spsims.wto.org/en/OtherDocuments/Search?DoSearch=True&DocumentSymbol=G%2FSPS%2FGEN%2F204%2FRev.17&DistributionDateFrom=07%2F03%2F2017&DistributionDateTo=07%2F03%2F2017&SubmittingMembers=&SubmittingObservers=&SubmittingObserverOrganizations=&Secretariat=&DevelopmentStatus=&GeographicGroups=&Title=&Keywords=&DocumentTypes= (accessed on 12 April, 2017)

*NR = Not Reported, R = Resolved.

The survey found that some cases may be raised in the WTO - for example, the lowering of MRL for ccc in grapes in 2016. However, for discussing the issue, India needs to collect scientific data on the MRL level of other countries, what proportion of the exports are likely to be impacted, the health-related repercussions of the chemicals, etc. Further, there is need for R&D to show that certain measures may not be based on scientific evidence. In the WTO, India may raise the issue with other exporting countries.

[217] Source: http://spsims.wto.org/en/SpecificTradeConcerns/View/374 (accessed on 12 April, 2017)

[218] Link to the regulation: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:303:0001:0030:EN:PDF (accessed on 12 April, 2017)

- ***Discuss the Issue Bilaterally by taking Buyers and their Association into Confidence:*** The survey showed that SPS issues are mostly discussed bilaterally with the importing country. Such discussions may be more beneficial if the EU buyers support it and if the restrictions imposed by the EU adversely impact them. There are instances, as in the case of tricyclazole for Basmati rice is a good example in this respect. In this case, certain relaxation of the time period of implementation of the measure has been given to Basmati rice growing countries (namely India and Pakistan) at the request of the European FBOs and other stakeholders.[219] Thus, working with EU buyers can help to reduce the SPS barrier.

- ***Sign Equivalence Agreements/MoUs:*** A number of studies pointed out that lack of mutual recognition of inspections and standards in cases of products such as peanuts and peanut products are a key SPS barrier (Das, 2008). This issue has also been raised in the survey. The WTO's SPS Agreement encourage member countries to recognise each other's conformity assessment systems based on international standards so that products certified in one country are accepted without the need for further inspection/testing by other countries through equivalence or MRA. Codex Alimentarius Commission also encourages such agreements with a view to avoid duplication of inspection and testing which can increase the cost of exports, and to ensure the health and safety concerns. The EU does enter into product specific MRA and such agreements are possible with countries that have strong export control system. India may sign product specific equivalence agreement with the EC.[220] The content of the agreement may include, among others, provision for retesting and appeal in case of product rejection.

  In this context, it is also important to note that APEDA is trying to negotiate product specific compliance with EU standards. Although it was successful in getting unilateral equivalence for certain commodities like organic fresh and processed products, it has recently lost the unilateral equivalence for export of processed organic products to the EU, in spite of setting up the organic standards for exports implemented.[221] This example also shows that unless there is a trade agreement, there is a risk that equivalence agreements and MoUs may be revoked by the trading partner. Thus, a trade agreement could provide more certainty to Indian exporters and processors compared to equivalence agreements.

  The case of withdrawal of equivalence for organic products has been raised by India in the WTO since the year 2014. The EU continues to maintain that this concern of India is not within the scope of the WTO's SPS Agreement as organic is not a food safety issue and the US supported this view. The WTO Secretariat noted that there was no WTO legal interpretation addressing organic products. Analysing this case in the WTO, the WTO experts and APEDA pointed out that as an emerging country it is extremely difficult for India to get "unilateral equivalence" for exports of organic produce in the future.[222] The

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219 Source: https://ec.europa.eu/food/sites/food/files/plant/docs/sc_phyto_20161128_ppr_sum.pdf (accessed on 12 April, 2017)

220 Also see http://www.fao.org/docrep/meeting/008/y5871e/y5871e0m.htm (accessed on 10 April, 2017)

221 Source: http://spsims.wto.org/en/SpecificTradeConcerns/View/378 (accessed on 12 April, 2017)

222 Source: WTO Committee on Sanitary and Phytosanitary Measures Document G/SPS/GEN/204/Rev.17 Dated 7 March 2017. Available at http://spsims.wto.org/en/OtherDocuments/Search?DoSearch=True&DocumentSymbol=G%2FSPS%2FGE

European companies want to export to and import from India, for which they will prefer "mutual" recognition of each other's conformity assessment systems or standards.

- ***Need for a Strong Food Control and Certification Mechanism:*** An EIC report[223] to the FAO points out that there is need to have a strong food control and certification system for both exports and imports. This is especially relevant in the context of the fact that India is trying to develop as an agro-processing base and become a key player in global food production network and value chain. The report highlights that there is need for accreditation of certifying bodies as per the international standards, improving the testing facilities in laboratories and identifying the areas that need to be addressed (for example, veterinary drug residue) and where they can be addressed (the issue of veterinary drug residues needs to be addressed at the farm level as it is difficult to control it in the processing units). The EC audits discussed in different case studies and this chapter also highlight the gaps in official inspection and testing procedures which need to be addressed.

  A number of studies[224] highlight that multiple regulations and regulating agencies not only make the export process cumbersome, it leads to wastage of national resources, lack of clarity in the procedures and lack of accountability. This issue needs to be examined. The exporters also pointed out that the exact processes should be laid down on the websites of the different agencies and a consolidated document should be created for key products that are exported if multiple agencies are involved. In this context, India can have business friendly export processes as is designed by countries like Australia for milk products exports to the EU. Same is also applicable to products such as peanuts and peanut products, where role of different agencies may be specified since it has changed recently. In this context, India may also examine the EU system of a single comprehensive risk management body and how it works to resolve issues such as aflatoxin contamination. India can also look at the case of countries such as Argentina.

  There is need for smooth flow of information between export regulating agencies and customs in case of change of standard practices. The case studies show that customs sometimes do not have updated information on different requirements for exports to different markets. All specifications, inspection and testing methods may be documented and made available on a common website.

- ***Need for Active Participation in International Standards Setting Organisation:*** India has been actively participating in the standard setting process of the international standards setting bodies. However, due to the prevalence of dual standards - a higher standard for exports to meet the importing country requirements and a lower standards for imports and the domestic market to meet the domestic concerns of small farmers etc. - somewhat

N%2F204%2FRev.17&DistributionDateFrom=07%2F03%2F2017&DistributionDateTo=07%2F03%2F2017&SubmittingMembers=&SubmittingObservers=&SubmittingObserverOrganizations=&Secretariat=&DevelopmentStatus=&GeographicGroups=&Title=&Keywords=&DocumentTypes= (accessed on 12 April, 2017)

223 http://www.fao.org/docrep/meeting/008/y5871e/y5871e0m.htm (accessed on 10 April, 2017)

224 See EIC report at FAO (http://www.fao.org/docrep/meeting/008/y5871e/y5871e0m.htm (accessed on 10 April, 2017) and Das, 2008.

weakens India's position in such negotiations. The Codex Trust Fund was launched in 2003 to help developed countries such as India to transit into the standards laid down by Codex Alimentarius. While India has aligned its own SPS standards to international standards such as Codex Alimentarius, food safety standards in most developed countries and a number of developing countries are far higher than the international standards. Further, India needs to actively push for international standards for certain food products like ethnic sweets.

- ***Knowledge Sharing and Collaboration with the EU:*** The case studies identified specific areas where there is need for knowledge sharing and collaboration with the EU. The EU-India CITD programme has helped to establish co-operation and to increase capacity of key beneficiaries, but there is possibilities of further co-operation and capacity improvement. For example, in spite of several years of knowledge sharing under the EU-India CITD programme, it is a matter of concern that the EU has found the Indian official inspection processes to be "unsatisfactory". There is need for discussions to understand where there are gaps in knowledge sharing.

To conclude, in spite of the issues that stakeholders may face, the report found that there is strong willingness among Indian exporters, processors and farmers to meet EU standards. The case studies of mangoes and fresh grapes reflect success stories; efforts were made by the government agencies, farmers and exporters to adhere to the EU norms to be able to export to them. The EU is a crucial market for India and all stakeholders (including exporters, farmers, processors, supply chain agents) have accepted that they have to meet EU export requirements and they are willing to do so, at least in the case of certain product categories such as table grapes, Alphonso mangoes and Basmati rice.

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