A STRATEGY PAPER ON AUGMENTING EXPORT OF VALUE ADDED PRODUCTS FROM INDIA

IL&FS CLUSTER DEVELOPMENT INITIATIVE LIMITED

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Submitted to
Agricultural and Processed Food Exports Development Authority (APEDA)
2015

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Executive Summary

Food processing includes industries that use agriculture/allied sector outputs for manufacturing of edible products. The food-processing sector employs about 13 million persons directly and about 35 million persons indirectly. India's agricultural production base is quite strong but at the same time wastage of agricultural produce is massive. Processing is very low at around 2.20% in fruits and vegetables, 35% in milk, 21% in meat and 6% in poultry. Value addition is only to the tune of 20% Food processing sector contributed about 14% of manufacturing Gross Domestic Product. Based on Ministry of Food Processing Industries' classification, this sector includes dairy, fruits& vegetable processing, grain processing, meat & poultry processing, fisheries and consumer foods including packaged foods, beverages and packaged drinking water. India's share in world trade in respect of processed foods is only 1.6 percent and India was ranked 27th in 2006 in terms of trade performance of Processed Food Products.

Thus in the view of above, the need for defining what should be construed as Food Processing is necessary because of different classifications by various departments/organizations (Ministry of Statistics and Programme Implementation, DGCI&S, DIPP etc.) on what Food Processing includes. The Ministry of Food Processing Industries, Government of India includes under food processing industries, items pertaining to these two processes viz. (a) Manufactured Processes and (b) Other Value-Added Processes. If any raw product of agriculture, animal husbandry or fisheries is transformed through a process [involving employees, power, machines or money] in such a way that its original physical properties undergo a change and if the transformed product is edible and has commercial value, then it comes within the domain of Food Processing Industries and (b) Other Value-Added Processes: Hence, if there is significant value addition (increased shelf life, shelled and ready for consumption etc.) such produce also comes under food processing, even if it does not undergo manufacturing processes. The following types of food products are usually considered while categorizing food products in the Indian food processing industry: a) Meat and Edible Meat Offal b) Fish, Crustaceans, Molluscs, Aquatic Invertebrates c) Meat, Fish and Seafood Preparations d) Dairy Products, Eggs, Honey, and Animal Products e) Cereal, Flour, Starch, Milk Preparations and Products f) Vegetable, Fruit, Nut, etc Food Preparations g) Miscellaneous Edible Preparations. The study undertaken focuses only on processed food products which may fall under both the definitions as outlined above. Hence for the sake of simplicity, only the term "processed food products" has been used to in the report.

Meat and edible meat offal: In the meat and edible meat offal market, Brazil is the leading exporter with 10.83% of share in world export in 2006. India's rank in this market has gone up from 23rd in 2002 to 20th

in 2006. India's export earnings in the meat and edible meat offal market has grown at the rate of 27% per annum and its leading trade partners are Malaysia, Angola, Saudi Arabia, Philippines and Kuwait.

Meat Preparations: India's performance is excellent in this market and its export earning has grown at the rate of 73% during 2002-2006. As a result India is ranked 23rd, up 33 points from 56th in 2002. India faces tough competition from Brazil and other Asian countries like Thailand, Indonesia and Vietnam in this market. India's major trading partners are Japan, China, UAE, Italy and USA.

Dairy Products, Eggs, Honey, and Animal Products: In this segment**,** India's export earnings have grown by 25% per annum and its trade competitive rank has gone up from 40th in 2002 to 35th in the world market of Dairy Products, Eggs, Honey, and Animal Products. In comparison with 2002, India's competitiveness has improved over countries like Thailand, Indonesia, Mexico and Norway. India's leading trade partners in this market are UAE, Egypt, Germany, Bangladesh and Oman.

Vegetable Fats and Oils, Cleavage Products: In this sector, India has experienced a growth of about 21% in the world export market. The country's leading trade partners are China, Netherlands, USA, France and Japan in this Market and the export earnings from Chinese market has grown at a hopping rate of 142%. Though India has outperformed countries like Singapore, Australia as compared to 2002, the export performances of Tunisia China and Russian Federation improved significantly. As a result India's trade competitiveness rank has seen a marginal drop to 22nd from 21st in 2002.

Cereal, Flour, Starch, Milk Preparations and Products: In this segment, Germany, Italy, France, Belgium and USA are the global leaders in the export of Cereal, Flour, Starch, Milk Preparations and Products. India's competitiveness rank has gone up from 36th in 2002 to 34th and the export earnings from this market have grown by 22% per annum. .India's major trading partners are USA, UK, UAE, Nepal and Sri Lanka.

Vegetable, Fruit, Nut, etc. Food Preparations: In this segment, vegetable, fruit, nut, etc., Food Preparations market, China is the most export competitive nation. However it is encouraging to note that India's export earnings have grown by 33% and trade competitiveness rank has gone up from 39th in 2002 to 28th. In the vegetable, fruit, nut etc market India's leading trade partners are USA, Russian Federation, UK, Netherlands and Canada.

Miscellaneous Edible Preparations: India's export in miscellaneous edible preparations is growing at the rate of 13% and the trade competitiveness of the country has improved to 31st from 33rd in 2002. The products like extracts essence & concentrates of coffee and tea, yeast, sauces mixed condiments & mixed seasonings, soups, broths & preparations thereof, Ice cream and food preparations, are all included under this category.

Demand Patterns for Processed Food Products in India

In India, the organized sector in food processing is poised to grow in the coming years. This is primarily due to rising incomes and quality and brand consciousness. Products like Juices and Pulp Concentrates are likely to rise by around 25 per cent of the total production in the country till 2025. Currently around 10 per cent is processed. Similarly in processed meat products which take less time to cook, branded products like Venky's and Godrej's Real Chicken products are becoming popular. Similarly aerated soft drinks, alchoholic beverages are also expected to contribute a substantial proportion of the domestic consumption of processed food products. The confectionery segment which is around US $ 490 million is growing at a rate of 6 per cent per annum and the biscuit segment which is US $ 374 million is growing at a rate of 8 per cent per annum.

Recommendations

Infrastructure Development: There is need to improve physical infrastructure like access to road (rural connectivity), power supply etc. as poor and irregular power supply is seriously hampering the productivity and competitiveness of this sector. Lack of special infrastructure for the food-processing sector like warehouses and cold storages as well as specialized transport facility/vehicles result in spoilage of perishable raw materials. Priority should be given for construction of rural roads connecting villages to markets for strengthening the linkage between raw material supplier and Processing Units. The Logistic/transport system may be developed on Public-Private Partnership. Processing units need be given special assistance for building captive power plants and for use of non-conventional energy sources. Providing tax holidays for 5 years for construction of modern automated warehouses and cold chains may be considered to provide an impetus to this sector. Similar incentives may be considered for construction, integrated cold chains, Modernized Abattoir etc, under public-private partnership.

Research & Development & Technology Up gradation: R&D especially in key areas like product development, packaging, and food technology needs to be strengthened. Government should focus on sponsored research and provide special research grants to leading Agricultural Research Institutes/Universities and Technical Institutes. Laboratories should be provided with necessary infrastructure, upgraded machineries and trained staffs.The small-scale and unorganized sectors account for 75% of the total food processing industry. These firms like any other SMEs face the common problems of low productivity, lack of access to technology, credit and market. Promotion of Technology Up gradation in these unorganized units through local level associations may be undertaken. Incentives in terms of financial assistance for procurement of Machinery, Credit at special rates, technical advice on productivity improvement and selection of equipment & machinery may be provided to units to enhance the productivity and competitiveness of food processing industry. Special Financing Schemes may be

formulated for encouraging the budding entrepreneurs/new entrants in the food processing sector. Additional priority should be given to develop Indigenous Technology to reduce the dependence on imported machinery. Central Excise Tax may be reduced from 16% on locally manufactured Food processing equipment, plant and machinery etc.

Implementation of Quality Standards/ Certification: Maintaining quality/standard of food products for the international market is a challenge as raw materials are seasonal (e.g., fruits and vegetables) and heterogeneous (for example, size, age & weight of livestock, marine products etc) in nature. Further, use of chemicals/drugs (e.g., pesticides in agriculture and growth hormone in livestock breeding) is a matter of concern for the food processing units targeting international markets. As such awareness on quality standards needs to be created through seminars, newsletters and training programmes. Food Processing units should be encouraged to implement Standards such as ISO, HACCP etc. Training in GMP, GHP, HACCP may be imparted to industry personnel. Special Cells at regional/state level may be created that would work as facilitating centers for implementation of standards and getting certification

Cost & Availability of Raw Material: Regular availability of cheap raw material is important for ensuring competitiveness of the food processing industries. In Indian environment, Nature (e.g., monsoon, flood, or drought) plays a critical role in determining supply of raw material to the industry. The cost of raw material is also high due to higher transportation costs and wastage of raw materials during transportation. There is multiplicity of taxes at different stages of procurement, transportation and processing which further adds to the cost of raw materials and products. Promotion of reliable and strong supply chain network between raw material suppliers and processing units on PPP basis should be taken up. Cheap capital may be made available to service providers for investments in infrastructure, enabling them to extend longer credit periods to their clients and supplementing their working capital.

Export Marketing of Products: With the Indian food processing industry still at an incipient stage, there is limited market intelligence available with respect to raw material as well as potential market for processed food products. Major players do carry out market studies either in- house or by engaging market analysts before launching a new product or entering a new market, but the information is not available to small players. Additionally, inefficient and unreliable marketing/distribution networks are failing to promote Indian brands in the international markets. Even in the case of Indian food processors that are using world-class production processes and maintain high quality, it is often viewed as an unpredictable and unreliable source of food and agro products. Some immediate steps are needed towards brand building of Indian food products in foreign markets. Supply chain and distribution channels should

be strengthened and Indian food standards be reviewed and aligned with the international standards like Codex to the extent possible. The Government and the Export promotion councils may consider embarking on promotional campaign to promote high value added "Made in India" food products in developed markets.

Review of Labour Laws, Training & Skill Development: Small scale and unorganized food processing units generally employ semiskilled and unskilled rural workers on contract basis. To create better and favorable work environment in these units, there is need to review and simplify age old labour laws keeping in focus the needs of the food processing sector. The sector also faces acute shortage of skilled and quality manpower. The sector requires trained manpower (viz. entrepreneurs, managers, technologists, skilled workers) for continuous technology upgradation &diversification, marketing of food products and management of quality control systems. The workers/ supervisors are generally unaware of various food safety and quality requirements and lack competency or knowledge on Food processing/ packaging techniques. Hence apex organization like NSDC and Food Processing Sector Skill Council should continue its focus on the skill development and training in this sector.

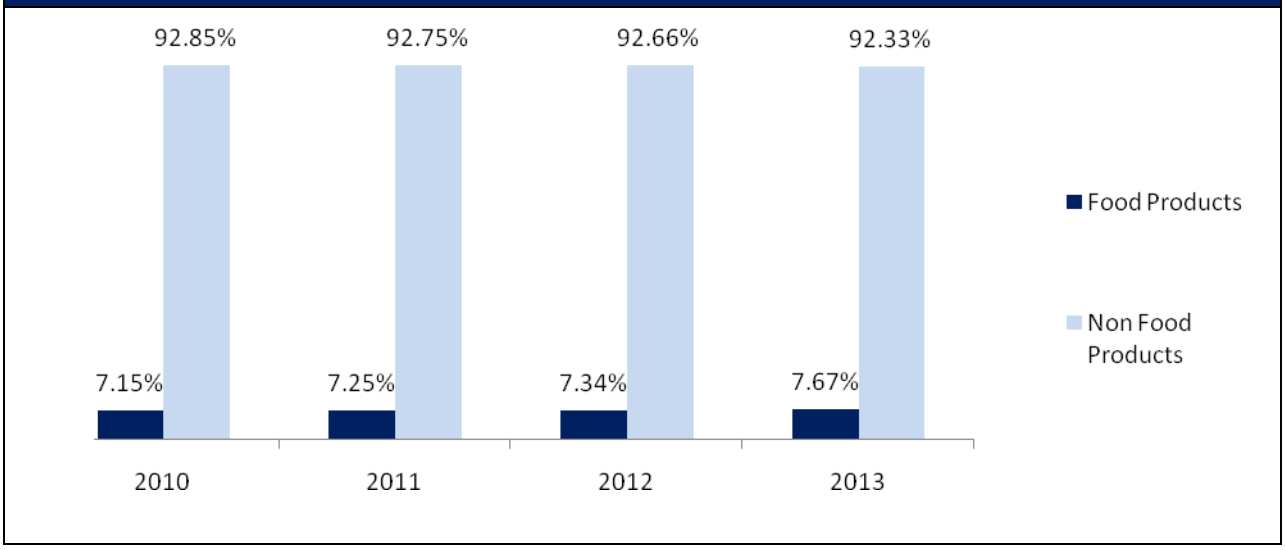
CHAPTER 1: INTRODUCTION

The Global Food Processing industry has experienced consistent demand as economies of every size continue to consume processed fruits and vegetable products and consumer spending increases as the world recovers from global the recession. Demand has grown particularly faster in developing economies as industrial growth has translated into greater urbanization, higher per capita incomes and expansion in the size of the middle class. As the global middle class category has grown, it has demanded larger quantities of higher quality and more-diverse food.

For developing countries, consumption and trade are shifting from basic staples towards higher value processed food products. In high-income countries, demand for value added products are increasing through processed consumer-ready products. The composition of world agricultural trade can be described in terms of changes in its major component parts. Total agricultural trade consists of food and non food commodities in both raw and processed forms. A useful classification of agricultural trade is a breakdown of agricultural trade into four components: bulk commodities, processed intermediate products, fresh horticultural products, and processed consumer goods. In recent times, the share of bulk has steadily dropped while the shares of non-bulk categories have remained steady or increased. Bulk commodities are no longer a valid indicator for measuring world agricultural trade growth. The share of intermediate processed commodities in total agricultural trade has not decreased as bulk commodities have. The slower trade growth for bulk does not by itself mean global demand for bulk commodities has slowed. The import demand for bulk commodities is partly satisfied with growth in intermediate processed products, which are essentially processed bulk commodities. Oilseeds processed into vegetable oil and meal can be subsequently traded, reducing demand for imported oilseeds. Grains fed to livestock ultimately produce a variety of meat and animal products sold in foreign markets, thereby curbing foreign import demand for grains. Fresh horticultural trade, consisting of products consumed without further processing, has kept pace with total agricultural trade, leaving its share nearly constant over this time period. Improvements in processing technology have played a role in expanding trade of fresh produce. The fastest growing category has been processed consumer goods. Factors driving trade growth in this product category are more complex than for other categories. Among major commodities there are dramatic differences in the rates of growth in trade. One recent phenomenon involves certain products entering international trade which previously was thought of as “non-tradeable.” This takes place as consumer preferences for foreign goods evolve and technology improves. Over the past 15 years many of the faster growing categories in trade are non-bulk packaged products, where consumers differentiate products carrying unique brands and labels. Pastry, prepared foods, and chocolates have grown in world trade by nearly 10 percent per year over the past 15 years. These alone account for more than $15 billion in world trade, a value exceeding the value of world wheat trade. Wine, a highly differentiated product,

has grown at a rate of 6 percent a year and is now $7.4 billion and likely will surpass trade in corn in value of trade. Growth in many of the processed intermediate products such as soybean oil, flour, and soybean meal has also exceeded growth rates for total agricultural trade (3.5 percent per annum). Import demand for these commodities originates (or is derived) from consumer's demand for finished processed food and livestock products. Trade in intermediate processed products depends on exporters having a comparative advantage over importers in performing milling/crushing activity required for bulk commodities. Exporting countries with larger home markets can take greater advantage of economies of scale, if they exist, as well as state-of the-art processing and processing technology. Wheat, corn, coffee, and cocoa beans account for most trade in bulk commodities. Bulk commodities are the slowest growing component of agricultural trade. Growth of these commodities has been less than 1 percent per year. An important factor in the changing structure of world agricultural trade is the dominant role developed countries have played. Most of the growth in consumer processed trade is attributable to developed country imports. Developed countries import a much greater share of processed consumer goods (consumer-ready goods) than developing countries, while the opposite is true for bulk commodities. In most cases, the developed countries' share of total imports of consumer goods increased, indicating faster import growth than developing countries. The following graph shows the percentage composition of food products in total merchandise exports in the period 2010-2013.

Share of Food and Non Food Exports during the period 2010-2013



The overall global trend in export of food products (including bulk commodities) is provided in the table below. The CAGR of the food exports has grown by 9 per cent during the period of 2010-2013.

Values are in USD Thousands

Product code (HS Code 2 Digit)	Product label	Exported value in 2010, US Dollar thousand	Exported value in 2011, US Dollar thousand	Exported value in 2012, US Dollar thousand	Exported value in 2013, US Dollar thousand
01	Live animals	18446392	21249611	22072338	22847915
02	Meat and edible meat offal	96791583	116621430	116893425	122183848
03	Aqua products	81860431	96099253	95595851	102737193
04	Dairy Products	70028551	83682298	81494731	92831369
05	Products of animal origin	7100547	8903159	9506416	10344780
07	Edible vegetables	56354524	62130325	57927749	65526306
08	Edible fruit, nuts, peel of citrus fruit, melons	75789824	87131061	91993453	95961580
09	Coffee, tea, mate and spices	36876428	51391527	47573004	44097993
10	Cereals	84353585	117228290	119991536	121529493
11	Milling products	14303166	18122558	18073584	18574178
12	Oil seeds	67893336	82220964	93452319	99508992
15	Fat based products etc.	81132041	110733390	106386990	98622935
16	Meat, fish and seafood food preparations	37262066	44597487	47028939	49087544
17	Sugars and sugar confectionery	44735324	53843447	52231706	50953628
18	Cocoa and cocoa preparations	38104162	43391599	43701175	45270140

19	Cereal, flour, starch, milk preparations and products	47911285	55881250	57931324	64107673
20	Vegetable, fruit, nut, etc food preparations	47581580	56622295	56786984	60516455
21	Miscellaneous edible preparations	47405502	55318239	56385811	62301564
22	Beverages, spirits and vinegar	86858059	104071442	106331168	110830926
24	Tobacco and manufactured tobacco substitutes	34683589	40121587	40899038	40836133

Key External Drivers: The key sensitivities affecting the performance of the Global Food Processing industry includes the following:

1. **Global consumer spending**

   Some types of processed fruit and vegetables, as well as juices, are considered discretionary purchases. As a result, an increase in consumer spending typically increases spending on such items.

2. **Global per capita income**

   As global per capita income increases, consumers are able to purchase more high-quality foods. For example, consumers with high incomes are able to purchase more expensive processed vegetable and fruit products, such as imported preserved vegetables that are not grown in one's home country. As a result, growth in global per capita income tends to increase demand for industry products.

3. **Global population**

   Processed food products throughout much of the world, and is becoming increasing popular with the increase of the global urban population, which has less access to processed food products than rural populations. As a result, demand for industry products tends to increase in line with growth in the world population.

4. **Current Performance**

The Global Food Processing industry includes all businesses that alter fresh food products to create a higher, valued-added food product for human consumption. Industry products include canned fruits and vegetables, fruit and vegetable juices, soups, sauces, processed meat products and dairy products, dehydrated fruits and vegetables. This industry does not include producers of nonfood fruit and vegetable products, nor does it include vegetable cooking oils or wine. The Global Food Processing industry has grown steadily over the past five years, as expansion of the world population (particularly growth in the world's urban population) and growth in global per capita income have spurred growth in global demand for food. In addition, the rising global health trend has increased consumer demand for higher-quality and more diverse fruit and vegetable products. Simultaneously, improvements in logistics and production processes have enabled the industry's larger multinational companies to increase their production and more efficiently distribute their products over geographically disparate markets. At the same time, while industry production is still concentrated in North America and Europe, where advanced fruit and vegetable processing has deep roots, the processed food infrastructure has been expanding in the developing world to meet its population's growing demand for industry products.

5. **Demand from developed economies**

Differences in food consumption patterns between developed and developing countries have had an effect on the Global Fruit and Vegetables Processing industry's performance in different parts of the world. In developed economies and many developing economies, consumption of processed fruit and vegetable products has long been the staple of a balanced diet. Consumption patterns vary between developed economies based on levels of commercialization in cities and cultural differences, but in general, processed fruit and vegetable consumption is much higher on a per capita basis in the developed world than it is in the under-developed world.

6. **Demand from the developing world**

Demand for processed food products has grown strongly in the developing world over the past five years, due to increasing industrialization and greater participation in world commerce. As the developing world's population has become more urbanized and incomes have risen, consumers are increasingly demanding premium branded products and greater diversity in their diets. This has led to an increase in demand for processed fruit and vegetable products as the developing world's population has increased its consumption of industry products and the ratio of processed to unprocessed food consumption has risen. Therefore, the majority of demand growth for industry products has come from the developing world over the past five years.

In the view of above, India is ideally poised to play an importance role in the global trade of value food products. India, with a large and diverse agriculture, is among the world's leading producers of agro products viz. cereals, milk, sugar, fruits and vegetables. Therefore, agro exports are a key area of focus. During 2013-14, export of agro products from India, including cotton, stood at USD 42.5 billion with a share of 13.6% in the total merchandise export from the country. The CAGR of agro exports during the period 2004-2014 has been 19%. The value added products comprised 18.2 per cent of total agricultural GDP in India. It is a matter of satisfaction that India's role in global export of agricultural products is steadily increasing. India has reached sixth place amongst the major exporters of agriculture products globally as per WTO trade data for2013. Our share in global exports of agriculture products which used to hover around 1- 1.5 % a few years ago has reached a respectable level of 2.7%. However, considering the large and diverse production base, there is immense potential which can be harnessed by further value addition to the agro produce. Government is seized of the factors that continue to impede the agro exports from the country. Structural imbalances leading to inconsistency in quality and lack of assured availability of raw materials on a regular basis are being addressed with the initiatives from various agencies both in the Central and State Governments. However, in view of the diversity in the ways in which agriculture production happens in different parts of our large country, a lot still needs to be done. In recent years, the factors influencing global trade in agro and food products have undergone a significant change. Through the multi lateral negotiations, the import duties have gone down considerably. The import duties are no longer considered as a major barrier to the international trade. The role of non-tariff barriers has increased progressively. There is need for addressing the issues relating to sanitary and phyto-sanitary measures for which adoption of global standards at all stages of supply chain would help us overcome these trade barriers. In view of multiplicity of stake holders in supply chain importance of backward linkages cannot be undermined.

Out of the USD 5.2 billion[1] export of processed agro products during 2013- 14, the major products like pulverized guargum (US$1683 million), wheat flour (US$135 million), groundnut kernels (US$500 million), mango pulp (US $ 130 million) etc. are largely primary processed items. Among the top ten products with substantial value addition, it is seen that in the area of biscuits & confectionery (US$170 million) and in Indian ethnic foods which come in the category of other food preparations not elsewhere specified (US$ 113 million) we have some presence in the global market. Undeniably, there is a huge scope to enhance the export of value added products and there is a need to increase our focus on value added items that can take us up in the global value chain of agro and food products. In view of the large

[1] ***A strategy Paper on augmenting export of Value Added Products from India Terms of Reference for the Study***

demand in domestic market for most of our agro produce, export of processed and value added products would be the key to further growth in agro exports from India. The consumption pattern of the household and people are experiencing a transition from homemade food to ready to eat food. Further, with the growth of the economy a shift is also seen in the food basket of cereals to a more varied and nutritious diet of fruit & vegetables, milk, fish, meat & poultry products. Thus, in this emerging economy with a large middle class of about 250 million, Indian foods processing Industry has a huge potential for growth and boost country's competitiveness for export growth as well.

Profile of Indian Food Processing Sector

Food processing is a large sector that covers activities such as agriculture, horticulture, plantation, animal husbandry and fisheries. It also includes other industries that use agriculture inputs for manufacturing of edible products. The food-processing sector employs about 13 million people directly and about 35 million people indirectly. In 2004-05, food processing sector contributed about 14% of manufacturing GDP with a value of Rs 2, 80,000 crores. Of this, the unorganized sector accounted for more than 70% of production in terms of volume and 50 % in terms of value. The Ministry of Food Processing, Government of India indicates the following segments within the Food Processing industry:

1. Dairy, fruits & vegetable processing
2. Grain processing
3. Meat & poultry processing
4. Fisheries and
5. Consumer foods including packaged foods, beverages and packaged drinking water

In India, the level of processing is the highest in the Dairy sector (35 %) i.e. 13% in the organized and 22% in the unorganized sector, followed by meat processing sector (21%), Marine Fisheries (10.7%) and Poultry (6%).

Item	Processing in Organized Sector	Processing in Un-organized Sector	Total Processing
Fruits & Vegetables	01.20%	00.50%	01.70%
Dairy Products	13.00%	22.00%	35.00%
Meat	21.00%	--	21.00%
Poultry	06.00%	--	06.00%

Source: Report of the Task Force on Development of Cold Chain in India, Department of Agriculture & Cooperation,2010

OBJECTIVE OF THE STUDY

The objective of this study is as follows:

1. Analyzing the export trend of value added/processed agro products from India over last 5 years and identification of 10 value added/processed agro products with biggest export potential in view of the global demand and revealed comparative advantage (RCA) for India. It is needless to reiterate that the identification of products will be solely on the basis of export potential and a feasibility of scaling up Indian export in the global market
2. Analyzing factors for RCA for identified products and examine global market trends to arrive at export projections for these products over next 5 years. Do a comparative analysis of major exporting countries for the identified products and describe their competitive advantage vis-à-vis India
3. Identifying possible challenges for these products including gaps in production/availability of raw materials, technology used, productivity levels and quality standards
4. Suggesting an Action plan for meeting possible challenges to growth and export potential for these products including measures for ensuring availability of raw materials, induction of modern technology in both production and processing and meeting quality and safety standards of global market etc.
5. Suggesting a package of possible incentives by the Government Agencies, including fiscal concessions and creation of common infrastructure facilities, to implement the Action Plan to help and meet export projections for these products
6. Studying supply chain of identified products in some of the competing countries and suggesting model(s) for adoption by states in India
7. Studying sanitary and phyto-sanitary and other quality requirements of the target markets and need of infrastructure for growers and processors to address these requirements
8. Studying GSP and other preferential duties applicable for the export of identified value added/processed products in the target markets and suggestions for the government for taking up the issues with trade partners in RTAs/FTAs.

Methodology

The study has been undertaken mainly in to two phases. The first phase included the review of literature and data analysis. The data sources used are ITC, Geneva and APEDA. The data analysis was carried out for three segments of data which are explained as follows:

1. **Processed Food Trend Analysis of India during 2009-2014**
   In this, the data set for the period of 2009-2014 was analyzed in terms of Compound Annual Growth Rate (CAGR) and the average for the same product during the same duration. This was done both in terms of value and volume. 31 fastest growing value added product categories were identified.
2. **Processed Food Trend Analysis in the global context during 2009-2014**
   For this the top value added food products in the global context was analyzed in terms of value and product wise percentage share for 2014. This was further compared with India's trade in terms of value for the same period and each product's share in the total trade of India. This was further supplemented with the annual growth trend and India's share in world exports and rank as well for the particular product.
3. **Top 10 value added food products exports from India in terms of value in 2014**
   In this the analysis was carried out for the year 2014 to understand India's recent position in the exports of value added products. The percentage wise distribution of each product was derived from the total export basket of value added food products.

In the second phase discussion with concerned stakeholders in the food processing manufacturing sectors and other stake holders like APEDA, MoFPI were undertaken to gather a better understanding of the sector.

Identification of Major Trade Partners & Competing Countries

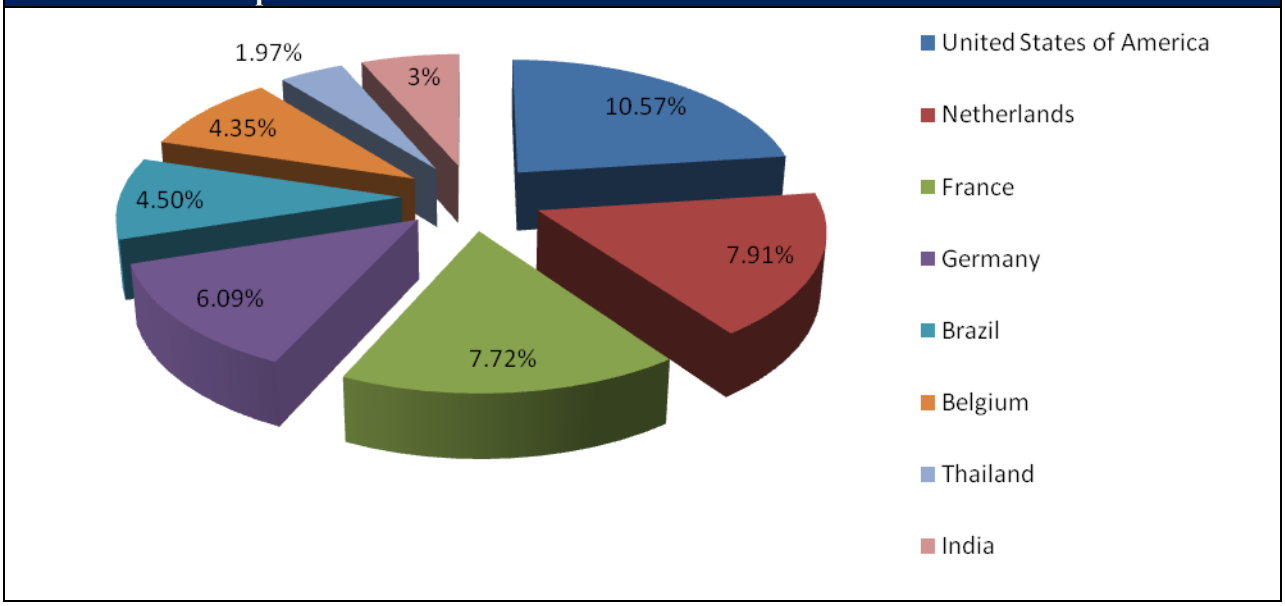
India's exports share in the world market for various processed food products is disintegrated among countries with whom India is trading. Then India's competitors in each market for each product are identified. The interactive market analysis tool developed by ITC, Geneva is used for this purpose as it uses the UNCTAD/WTO trade database for 184 countries.

CHAPTER 2: THE PROCESSED FOOD PRODUCTS SECTOR IN INDIA

The processed food industry is one of the largest in India. It is ranked fifth in terms of export, expected growth, production and consumption. As a matter of fact, increasing incomes are accompanied by changes to our food habits. Fuelled by large disposable incomes, a marked change is seen in the food consumption patterns. A significant part of this consumption change is enhanced by the processed food market, which accounts for at least 30 per cent of the food market. Industry sources claimed that the food processing industry would attract investments to the tune of $33 billion spread over ten years and get employment for a massive group of the currently employable group. The government, on its part, has formulated and implemented several plans and schemes to provide financial assistance, initially to set up food processing units and later to modernise as well. There is excellent support with regard to infrastructure, research and human resource development, in addition to other promotional aspects, to encourage the food processing industry.

This value addition in the food processing industry in India is around 20 percent to total food production. The Indian food industry is characterized by the small and unorganized sector that accounts for 75% of the total industry. Despite all the above facts, the food-processing sector is profitable for the emerging markets like India. India is one of the largest producers of raw material for the food processing industry in the world but the industry itself is not fully developed until now. The value addition in the Indian food-processing sector is very low as compared to other developed nations; with sector contributing 14% of manufacturing GDP with a share of Rupees 2, 80,000 crores. Of this, the unorganized sector contributes more than 70% of the production in terms of volume and 50% in terms of value. The foreign investment has been coming mostly for processing of mushrooms, manufacture of banana paste, fruit pulp and juice concentrate and in ventures like dehydration of fruits and vegetables and instantaneous freezing of fresh fruits and juice. The overall exports of agriculture and processed food products have touched US$ 11,023.79 million in the period April-September 2014. The exports of fruits and vegetables, both processed and fresh, have touched US$ 1,153.81 million, while animal products registered US$ 2,570.82 million in exports during the same period of 2014. Overall India shares around 3 per cent in the total exports of processed food in the global market.

India's share in Exports of Processed Food Products[2]



The processed food industry in India can be broadly classified as:

- Grain processing;
- Fruit, vegetable and dairy processing;
- Fisheries;
- Meat and poultry processing, and
- Packaged food

Grain processing

It refers to the processing of grains and grain flours that have been significantly modified from their natural composition. The modification process generally involves the mechanical removal of bran and germ, either through grinding or selective sifting. However, in case of some grains, the removal of fibre, coupled with fine grinding, results in a slightly higher availability of grain energy for use by the body. Primary milling of grains is the most important activity in the grain processing segment of the industry. However, primary milling adds little to shelf life, wastage control and value addition. Around 65 per cent of the rice produced is milled, mostly in modern rice mills. However, the sheller-cum-huller mills in operation give low recovery. Wheat is processed for flour, refined wheat flour, semolina and grits. Dal milling is the third-largest segment in the grain processing industry, and has approximately 11,000 mechanised mills in the organised segment. Indian rice, especially basmati rice, has gained international

[2] http://omicsonline.org/food-processing-industry-in-india-s-and-t-capability-skills-and-employment-opportunities-2157-7110.1000260.pdf

recognition, and is a premium export product. Branded grains and grain processing are now gaining popularity.

Fruit, vegetable and dairy processing

The fruit and vegetable processing industry is highly decentralised, and a large number of units are in the cottage or household and small-scale sector, having small capacities of up to 250 tonnes per annum. Since 2000, such segments as ready-to-serve beverages, fruit juices and pulps, dehydrated and frozen fruits and vegetable products, pickles, processed mushrooms and curried vegetables have shown significant growth, and units engaged in these are largely export-oriented. A significant thrust can be given to this sector by strengthening the linkages between farmers and processors. The weak linkage between farmers and markets, as well as, farmers and processing companies has brought about inefficiencies in the supply chain and encouraged the involvement of middlemen. The government of India's National Agriculture Policy envisages the participation of the private sector through contract farming and land leasing arrangements, which not only assures supply of raw material for processing units, but also a market for agriculture produce, accelerate technology transfer and capital inflow into the agriculture sector. The domestic industry is yet to change its preference in favour of processed foods. The consumption of value-added fruits and vegetables is low compared to the primary processed foods and fresh fruit and vegetables. The inclination towards processed foods is mostly visible in urban centres. India has one of the highest livestock populations in the world, accounting for about 50 per cent of its buffalo and 20 per cent of its cattle population, most of which are milch cows and milch buffalo.India's dairy industry is considered as one of the most successful development programmes in the post-Independence era. Dairy cooperatives account for the major share of the processed liquid milk marketed in India. Milk is processed and marketed by 170 milk producers' cooperative unions, which federate into 15 state cooperative milk marketing federations. Over the years, several brands have been created by cooperatives like the Gujarat Cooperative milk Marketing Federation (GCMMF), which markets its products as Amul; Vijaya (Andhra Pradesh); Verka (Punjab); Saras (Rajasthan); Nandini (Karnataka), Milma (Kerala) and Gokul (Kolhapur, Maharashtra).

Fisheries

India is the second-largest producer of fish in the world, contributing to 5.43 per cent of the global fish production. India is also a major producer of fish through aquaculture. It ranks second in the world after China. The total fish production during 2010-11 was at 8.42 million metric, tonnes with a contribution of 5.20 million metric tonnes from the inland sector and 3.22 million metric tonnes from the marine sector respectively. The processing of marine produce into canned and frozen forms is carried out almost

entirely for the export market. The infrastructure facilities for processing of marine products include 372 freezing units with a daily processing capacity of 10,320 tonnes and 504 frozen storage facilities with a capacity of 138,229.10 tonnes. Apart from these, there are 473 pre-processing centres and 236 other storages. Aquaculture is one of the fastest-growing food producing sectors in the world, with an annual growth of around seven per cent. India is the second-largest producer of fish, both overall and from aquaculture. Fish and fishery products would be mostly sourced from aquaculture and culture-based capture fisheries in reservoirs as capture fisheries' growth the world over is stagnant.

Meat and poultry processing

Today, India's free-ranging, steroid and fat-free meat is winning worldwide acceptance. About 40,000 veterinary centres and numerous research stations ensure that India's meat and poultry products meet the most stringent quality checks worldwide. The production of meat and meat products has shown an impressive growth. The total meat production in the country is four million tonnes, which includes beef, buffalo meat, mutton, goat meat, pork and poultry meat. However, only about one per cent of the total meat is converted into value-added products like sausages, ham bacon, luncheon meat, kababs and meatballs. The current level of exports of meat and meat products from India is $190 million, the major destinations being the countries in the Middle-East and South-East Asia.
The meat processing sector has attracted a total investment of $471.1 million in the last six years (i.e. since the initiation of the liberalisation process, including foreign direct investment [FDI] of $116.1 million).The poultry industry is among the fastest-growing sectors rising at a rate of eight per cent per year. The vertical integration of poultry production and marketing has lowered the costs of production, marketing margins and consumer prices of poultry meat. There are eight integrated poultry processing units in the country, which hold a significant share in the industry. While the production of agricultural crops has been rising at a rate of 1.5 to 2 per cent per annum the growth of eggs and broilers has been rising at a rate of eight to ten per cent per annum. As a result India is now the world's fifth-largest egg producer and the eighteenth-largest producer of broilers.

Factors driving the sector

The consumption patterns in India have been undergoing a visible shift. Earlier, the share of cereal products was the highest, followed by milk and milk products; vegetables, edible oil and meat products.
However, in recent years, the growth rates for fruit, vegetables, meat and dairy products have been higher than cereals and pulses. This shift, in turn, implies that there is also a need to diversify the food production base to match the changing consumption preferences.

The key aspects which need to be looked into are:

- Lack of adequate quality control;
- Supply chain inefficiency and middlemen's involvement;
- Increasing inventory carrying costs;
- Higher taxation;
- Higher packaging costs, and
- Cultural preference of fresh food

Significance of exports in the food processing sector

The food processing industry has strong backward linkages with rural economy, as all the raw material is produced by rural people. Hence, any growth in food processing industry, positive or negative will have a direct impact on economy of rural India. According to NABARD (2005-06), the share of agro-industry in village level rural industry in terms of number of enterprises, total employment and gross value added were 83 per cent, 78 per cent and 72 per cent respectively. Out of the agro processing sector in rural areas, the food processing industry is the second most important Industry, in terms of revenue generation. But there is a huge productivity gap because of the use of traditional technology in production.

CHAPTER 3: ANALYSIS OF THE EXPORT TREND OF VALUE ADDED PRODUCTS

Having developed an understanding of the domestic sector in the food processing industry, the key food products were further classified into the following three broad categories:

A. Processed Food derived from Animal products including dairy products: This included Buffalo meat, Sheep/Goat meat, other meat, processed meat, Poultry and dairy products mainly presented in Table 1. In this category a total of 40 major products were shortlisted based on the trade volume and value of the products.
B. Processed food products derived from fruits and vegetables: This included Cucumber and Gherkins (Prepared. & Preserved), Dried and Preserved Vegetables, Mango Pulp, Pulses and other processed fruits and vegetables presented in Table 2. In this category a total of 30 major products were shortlisted based on the trade volume and value of the products.
C. Other Processed Food Products which included Groundnuts, Guargum, Jaggery & Confectionery, Cocoa products, Cereal Preparations, Milled products and Alcoholic Beverages mainly presented in Table 3. In this category a total of 60 major products were shortlisted based on the trade volume and value of the products

Overall a trend analysis of 130 product categories was carried for the period of five preceding years 2009-2014. The trend analysis comprised of the following five parameters:

1. Compounded Annual Growth Rate for Volume in Metric Tons
2. Average Volume of Trade in Metric Tons
3. Compounded Annual Growth Rate for Value in percentage
4. Average Value of Trade in Metric Tons
5. Export Value per Metric Ton. The unit used here is Rupees Lakhs.

The above analysis enabled us to indentify the key food products which showed a substantial positive growth in each of the above mentioned categories.

A. Processed Food derived from Animal products including dairy products

In this category the following 8 food products showed major growth either/both in terms of value and volume based on the indentified parameters:

1. Fresh and Chilled Buffalo Meat
2. Frozen Buffalo Meat
3. Fresh/Frozen/Chilled Sheep/Goat Offals
4. Frozen offal swine meat
5. Extracts & Juices of meat
6. Fresh/Chilled/Frozen Fowl
7. Milk & Milk products
8. Yoghurt/Butter Milk/Curdled Milk/Cream

Table 1

SL No	Buffalo Meat		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
1	201	Fresh and Chilled Meat	9%	9603.85	42%	19226.24	2.00
2	202	Frozen Meat	31%	920671.52	47%	1382477.21	150%
3	206	Fresh/Chilled/Frozen Offals	68%	22430.49	110%	31738.04	141%
4	210	Offal	-100%	416.45	-100%	770.77	185%
	Sheep/Goat Meat		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
5	2041	Fresh/Chilled Lamb	-4%	1238.20	5%	2684.53	2.17
6	2042	Fresh/Chilled Sheep	-19%	13516.79	2%	29735.44	2.20
7	2043	Frozen Lamb	-49%	123.39	-38%	230.01	1.86
8	2044	Frozen Sheep	-18%	5504.13	-1%	11808.44	2.15
9	2045	Goat Meat	-25%	11998.15	-9%	24836.91	2.07
10	2068	Fresh/Frozen/Chilled Offals	40%	1133.54	14%	1100.69	0.97
	Other Meat		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
11	2064	Frozen offal swine meat	243%	49.35	144%	58.60	1.19
12	2031	Fresh/Chilled swine meat	-76%	59.18	-77%	71.07	1.20
13	2032	Other meat of swine meat	-52%	123.21	-38%	78.62	0.64
14	2063	Frozen Swine Meat	#DIV/0!	5.60	#DIV/0!	1.75	0.31
15	2089	Other Meat Offal Products	-83%	14.46	-80%	12.06	0.83
16	2091	Fresh/Chilled/Frozen/Salted in Brine Pig Fat	#DIV/0!	3.46	#DIV/0!	6.42	1.85
17	2101	Salted/Brine meat of Swine	-72%	333.10	-68%	356.46	1.07
18	1602	Prepared/Preserved parts of swine	-55%	0.75	-73%	6.54	8.69
	Processed Meat		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
19	1601	Sausages/Offals of other animals	-10%	194.69	10%	393.18	2.02
20	1602	Preparations/Preservations of Other animals	-7%	496.40	-18%	576.15	1.16
21	1603	Extracts & Juices of meat	57%	0.71	95%	6.11	8.63
	Animal Casings		CAGR	Average	CAGR	Average	Export Value per

	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		MT(Rs Lakhs)
22	504	Guts of Sheep/Goat	-35%	1140.72	-8%	2772.86	2.43
	Poultry		**CAGR**	**Average**	**CAGR**	**Average**	**Export Value per**
	HS Code	**Product Type**	**Quantity(MT)**		**Value(Rs. Lakhs)**		**MT(Rs Lakhs)**
23	1051	Live Birds	54%	381.80	69%	280.23	0.73
24	2071	Fresh/Chilled/Frozen Fowl	67%	4609.87	87%	3534.41	0.77
25	2072	Fresh/Chilled/Frozen Turkey	#DIV/0!	59.16	#DIV/0!	35.37	0.60
26	2073	Cut pieces Fresh/Chilled/Frozen Ducks, Geese or Guinea fowls	-100%	823.64	-100%	342.52	0.42
27	2074	Uncut pieces of Fresh/Chilled/Frozen Ducks, Geese or Guinea fowls	#DIV/0!	17.85	#DIV/0!	7.48	0.42
28	2075	Fresh/Chilled Offals	#DIV/0!	2.86	#DIV/0!	3.42	1.19
29	4070	Eggs	-20%	620282.53	-2%	21512.11	0.03
30	4081	Egg yolks/unshelled	3%	8462.39	14%	18360.92	2.17
31	505	Other parts/feather	3%	14383.96	20%	32917.88	2.29
	Dairy Products		**CAGR**	**Average**	**CAGR**	**Average**	**Export Value per**
	HS Code	**Product Type**	**Quantity(MT)**		**Value(Rs. Lakhs)**		**MT(Rs Lakhs)**
32	401	Milk and Cream product	7%	7131.71	11%	2405.12	0.34
33	402	Milk & Milk products	62%	49855.72	76%	90861.49	1.82
34	403	Yoghurt/Butter Milk/Curdled Milk/Cream	36%	273.80	92%	570.78	2.08
35	404	Whey Products	-33%	547.69	-23%	533.96	0.97
36	405	Butter/Butter Oil/Ghee	16%	8220.60	19%	19500.50	2.37
37	406	Cheese	5%	2872.10	13%	5541.90	1.93
	Natural Honey		**CAGR**	**Average**	**CAGR**	**Average**	**Export Value per**
	HS Code	**Product Type**	**Quantity(MT)**		**Value(Rs. Lakhs)**		**MT(Rs Lakhs)**
38	4090000	Natural Honey	21%	23907.62	32%	31401.93	1.31
	Egg Albumin		**CAGR**	**Average**	**CAGR**	**Average**	**Export Value per**
	HS Code	**Product Type**	**Quantity(MT)**		**Value(Rs. Lakhs)**		**MT(Rs Lakhs)**
39	3502	Albumin and its derivatives	15%	1507.61	36%	7052.02	4.68
	Caesin		**CAGR**	**Average**	**CAGR**	**Average**	**Export Value per**
	HS Code	**Product Type**	**Quantity(MT)**		**Value(Rs. Lakhs)**		**MT(Rs Lakhs)**
40	3501	Caesin	8%	8966.98	27%	36919.00	4.12

B. Processed food products derived from fruits and vegetables

In this category the following 6 food products showed major growth either/both in terms of value and volume based on the indentified parameters

1. Dried Vegetables
2. Berries, other fruits & nuts
3. Vegetables, Fruit, Nuts, Fruit-Peel & Other Parts of Plants, Preserved By Sugar (Drained, Glace Of Crystallized)

4. Squashes
5. Chickpeas (Garbanzos), Dried, Shelled, Whether Or Not Skinned/Split
6. Beans

Table 2

Sl No	Cucumber and Gherkins(Prepd. & Presvd)		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
1	20011000	Cucumbers & Gherkins, Prepared/Preserved By Vinegar/Acetic Acid	-1%	170039.62	10%	55033.73	0.32
2	7114000	Cucumbers & Gherkins, Provisionally Preserved	-13%	67663.94	-0.39%	21234.88	0.31
	Dried and Preserved Vegetables		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
3	7122	Dried Onions	9%	43158.18	21%	37640.05	0.87
4	7129	Dried Vegetables	45%	7312.17	68%	4593.73	5.87
5	7123	Dried Mushrooms and other fungi	47%	171.82	37%	6105.78	35.54
6	711	Provisionally preserved vegetables	-5%	3113.95	18%	2425.95	0.78
7	7115	Provisionally preserved mushrooms and other fungi	-4%	1169.46	14%	875.84	0.75
8	7112	Provisionally preserved olives	-100%	6.65	-100%	3.64	0.55
	Mango Pulp		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
9	8045040	Mango Pulp	-2%	165918.53	1%	71317.49	0.430
	Other processed fruits and vegetables		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
10	8111	Berries, other fruits&nuts	26%	18463.43	43%	10512.57	0.57
11	812	Provisionally preserved fruits and nuts	-49%	4859.084	-43%	1835.05	0.378
12	813	Dried fruits	3%	24472.71	17%	8757.14	0.36
13	8140000	Peel Of Citrus Fruit/Melons, Including Watermelons, Fresh/Frozen/Dried/Provisionally Preserved In Brine, In Sulpher Water Or In Other Preservative Solutions	-0.10%	156.88	23.81%	108.59	0.69
14	20019000	Other Edible Parts Of Plants Prepared Or Preserved By Vinegar/Acetic Acid	1.5%	39784.12	16%	21242.11	0.53
15	2002	Tomatoes (not prepared by vinegar)	16%	812.56	14%	403.038	0.496010141
16	2003	Mushrooms and truffles	-56%	9752.88	-3%	6828.978	0.70

17	2004	Vegetables (not prepared by vinegar)	5%	10022.922	24%	9011.16	0.90
18	2005	Unfrozen vegetables, bamboo shoots	-4%	18490.95	14%	13762.37	0.74
19	20060000	Vegetables, Fruit, Nuts, Fruit-Peel & Other Parts Of Plants, Preserved By Sugar (Drained, Glace Of Crystallised)	-51%	4969.66	49%	716.00	0.14
20	2007	Jams, jellies, mrmlds	12%	70586.22	22%	41805.22	0.59
21	20081	Prepared/Preserved Nuts	16%	16608.57	49%	17327.65	1.04
22	20089	Preserved/preapred fruits	6%	433.32	35%	330.73	0.76
23	200899	Squashes	83%	20443.172	94%	12192.346	0.59640187
24	2009	Fruit Juices	0%	11074.11	4%	5459.80	0.49
	Pulses		**CAGR**	**Average**	**CAGR**	**Average**	**Export Value per MT(Rs Lakhs)**
	HS Code	**Product Type**	**Quantity(MT)**		**Value(Rs. Lakhs)**		
25	7132000	Chickpeas (Garbanzos), Dried, Shelled, Whether Or Not Skinned/Split	37%	199718.43	44%	104047.63	0.52
26	7139	Tur and other leguminous vegetables (dried and shelled)	18%	3690.57	39%	1921.95	0.52
27	7135000	Broad Beans (Vicia Faba Var. Major) & Horse Beans (Vicia Faba Var. Equina, Vicia Faba Var Minor)	-45%	30.63	-32%	13.61	0.44
28	7134000	Lentils, Dried, Shelled, Whether Or Not Skinned/Split	5%	586.06	13%	335.74	0.57
29	7133	Beans	88%	1691.20	108%	1027.26	0.61
30	7131000	Peas (Pisum Sativum), Dried, Shelled, Whether Or Not Skinned/Split	4%	596.98	3%	207.27	0.35

C. Other Processed Food Products

In this category the following 17 food products showed major growth in terms of value and volume based on the indentified parameters:

1. Guargum Treated And Pulverised
2. Guargum Refined Split
3. Jaggery
4. Syrups
5. Confectionery
6. Cocoa Powder without SM
7. Cocoa Powder with SM

8. Cereal Pellets
9. Rolled/Flaked Cereals
10. Wheat Flour
11. Groats/Meal
12. Potato powder/flakes/granules
13. Starch
14. Soft drink concentrates
15. Blended Whisky
16. Gin
17. Vodka

Table 3

SL No	Groundnuts		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
1	1202	Seed Quality Nuts	#DIV/0!	250.24	#DIV/0!	175.98	0.70
2	12024	Shelled Nuts	#DIV/0!	101682.73	#DIV/0!	63578.73	0.63
3	12021	Seed Quality Shelled Nuts	-100%	8874.20	-100%	4118.48	0.46
4	12022	Ground-nuts kernal HPS/NES	-100%	419576.57	-100%	254204.47	0.61
	Guargum		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
5	13023230	Guargum Treated And Pulverised	28%	326966.79	82%	909595.51	2.78
6	13023220	Guargum Refined Split	27%	74155.76	75%	149243.30	2.01
7	13023210	Guar Meal	34%	74011.68	46%	13509.33	0.18
	Jaggery & Confectionery		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
8	1701	Jaggery	22%	44398.13	33%	12868.01	0.29
9	1702	Syrups	20%	98145.75	25%	28696.23	0.29
10	1704	Confectionery	19%	41436.46	28%	29821.12	0.72
	Cocoa products		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
11	1801	Cocoa Beans	-89%	331.20	-89%	544.84	1.65
12	1802	Cocoa waste	-100%	33.40	-100%	11.36	0.34
13	1803	Cocoa paste	36%	3127.52	43%	6667.90	2.13
14	1805	Cocoa Powder without SM	101%	109.48	107%	186.93	1.71
15	1806	Cocoa Powder with SM	30%	9373.82	68%	17881.78	1.91

	Cereal Preparations		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
16	1103	Cereal Pellets	70%	459.66	105%	222.71	0.48
17	1104	Rolled/Flaked Cereals	46%	5222.24	71%	1801.79	0.35
18	1109	Gluten	-50%	512.23	-44%	247.02	0.48
19	1901	Malt Products	7%	49048.48	24%	47142.65	0.96
20	1902	Pasta	11%	5388.28	24%	7969.40	1.48
21	1903	Tapioca	16%	1564.67	39%	778.24	0.50
22	19041	Roasted Cereal products	3%	16766.57	19%	9085.35	0.54
23	19042	Unroasted cereal products	1%	32850.00	15%	8964.74	0.27
24	19051	Breads and Wafers	30%	104338.38	43%	63600.26	0.61
25	19059	Pastries and Cakes	12%	58637.04	23%	46490.84	0.79
	Milled products		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
26	1101	Wheat Flour	78%	149624.02	83%	33426.46	0.22
27	1102	Rye/Corn Flour	-14%	24347.00	-2%	6172.25	0.25
28	1103	Groats/Meal	44%	57373.20	56%	6780.72	0.12
	Miscellenous products		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
29	1105	Potato powder/flakes/granules	47%	5772.55	74%	2074.41	0.36
30	1106	Flour products of Vegetables	17%	16018.88	36%	13267.87	0.83
31	1107	Malt products	20%	24786.45	18%	1875.40	0.08
32	1108	Starch	50%	3074.32	65%	24915.20	8.10
33	1517	Peanut Butter	-67%	1432.97	-60%	1353.08	0.94
34	2102	Yeast Product	-12%	1403.71	5%	1175.65	0.84
35	2103	Sauce product	-8%	9832.04	31%	12284.13	1.25
36	2104	Soups and Broths	-7%	12648.16	11%	2461.03	0.19
37	2105	Ice Cream without cocoa	6%	392.34	29%	492.75	1.26
38	2106	Protein concentrates	27%	12942.26	39%	7702.16	0.60
39	2106	Soft drink concentrates	-2%	17518.31	49%	7656.32	0.44
40	21069	Pan masala based products	24%	19714.95	6%	8070.47	0.41
41	21069080	Custard Powder	-10%	157.22	6%	165.37	1.05
42	2201	Water	-8%	961.86	6%	190.95	0.20
43	2202	Aerated water containing sugar	3%	10129.44	22%	4622.02	0.46
44	2209	Vinegar	-34%	10694.46	-32%	244.97	0.02
	Alchoholic Beverages		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
45	22030000	Beer Made From Malt	15%	31086.99	29%	13053.81	0.42
46	2204	Port Wine/Sherry	6%	1272.47	22%	2581.60	2.03

47	2205	Vermouth Wine	-30%	18.94	-23%	71.61	3.78
48	2206	Other Fermented Beverages like Cider, Perry etc.	-32%	208.52	-27%	137.26	0.66
49	2207	Spirits	74%	129832.79	86%	56624.57	0.44
50	22082	Brandy	37%	1011.24	41%	2442.31	2.42
51	22083	Bourbon	-43%	3486.67	-34%	8184.56	2.35
52	2208	Scotch	56%	724.50	31%	2201.73	3.04
53	NA	Blended Whisky	105%	2940.08	86%	8532.64	2.90
54	NA	Other whisky	25%	18937.73	30%	29996.88	1.58
55	NA	Rum	28%	2280.19	28%	2400.06	1.05
56	22084	Tafia	18%	108.60	-4%	229.12	2.11
57	NA	Gin	46%	394.50	55%	1239.03	3.14
58	22085	Vodka	83%	587.77	74%	1502.40	2.56
59	22089	Tequila	36%	22.97	15%	57.97	2.52
60	22082	Others	24%	3194.73	40%	13978.08	4.38

CHAPTER 4 GLOBAL MARKET TRENDS IN VALUE ADDED FOOD PRODUCTS

In the preceding chapter, a list of 31 major best performing products in the Indian food processing sector was identified. This chapter will focus on analysis the performance and trend in the global market with comparison to the Indian market for the value added food products.

The analysis was carried out on the following parameters:

1. Global export value for 2014 for each product
2. The product percentage share in Global export value share
3. Exported value for 2014 from India
4. The product percentage share in exported value from India
5. Annual growth of world imports between 2009-2014
6. India's share in world export in percentage
7. India's ranking in world exports

The major categories identified on the basis of the above defined parameters in the analyzing the global trend is as follows:

1. Fruits and Vegetable preparations
2. Meat Products
3. Dairy and Animal Products
4. Cereal Based Preparations
5. Fat Based products
6. Meat Preparations
7. Sugar and Confectionery
8. Cocoa based preparations
9. Miscellaneous Food Products
10. Alcohol Products

A total of 84 products were indentified and analyzed to assess the global trend and map India's position in these products. They are presented in the tabular format below.

For each of the above identified product categories, products having a substantial share in total global export value were identified. They are as follows:

1. Fruits and Vegetable preparations
    - Preserved fruits

- Prepared or preserved vegetables (excluding frozen)
- Prepared or preserved vegetables (including frozen)
- Fruit & vegetable juices, unfermented

2. Meat Products
    - Meat of bovine animals, frozen
    - Meat of bovine animals, fresh or chilled
    - Meat & edible offal of poultry meat
    - Meat of swine, fresh, chilled or frozen
3. Dairy and Animal Products
    - Milk and cream, concentrated or sweetened
    - Cheese and curd
    - Milk and cream, not concentrated nor sweetened
4. Cereal Based Preparations
    - Bread, biscuits, wafers, cakes and pastries
    - Malt extract; food preparations of flour, meal, starch or malt extract
5. Fat Based products
    - Safflower, sunflower/cotton-seed oil & fractions
    - Soya-bean oil & its fractions
    - Palm oil & its fraction
6. Meat Preparations
    - Prepared or preserved meat, meat offal or blood
    - Sausages and similar products, of meat, offal or blood
7. Sugar and Confectionery
    - Cane or beet sugar and chemically pure sucrose, in solid form
    - Sugars, pure lactose, artificial honey, caramel
    - Sugar confectionery (incl white choc), not containing cocoa
8. Cocoa based preparations
    - Chocolate and other food preparations containing cocoa
    - Cocoa beans, whole or broken, raw or roasted
9. Miscellaneous Food Products
    - Extracts essences & concentrates of coffee and tea
    - Other Food preparations
    - Sauces mixed condiments & mixed seasonings
10. Alcohol Products

- Spirits, liqueurs, other spirit beverages, alcoholic preparations
- Beer made from malt
- Non-alcoholic beverages (excl. water, fruit or vegetable juices)
- Wine of fresh grapes

The products in which India features in top 10 ranking in terms of value are as follows:

SL No	HS Code	Product Name	India's Rank in the category	Share(%) in Global Exports in 2014(Value)
1	1515	Fixed vegetable fats oils & their fractions	1	4%
2	202	Meat of bovine animals, frozen	2	18%
3	2001	Cucumbers, gherkins and onions preserved by vinegar	3	3%
4	1701	Cane or beet sugar and chemically pure sucrose, in solid form	5	63%
5	204	Meat of sheep or goats - fresh, chilled or frozen	7	5%
6	408	Birds' eggs dried	7	1%
7	1903	Tapioca and substitutes therefore prepared from starch	7	0.14%
8	2101	Extracts essences & concentrates of coffee and tea	8	13%
9	409	Natural honey	9	2%
10	2207	Ethyl alcohol & other spirits (if undenatured then higher than 80% by	10	8%
11	402	Milk and cream, concentrated or sweetened	10	26%
12	1508	Ground-nut oil its fractions	10	0.36%

		GLOBAL		INDIA		TRADE INDICATORS		
Code	**Product label**	**Global Export Value 2014(USD Thousand)**	**Product % share**	**Exported value 2014(USD thousand) from India**	**Product % share**	**Annual growth of world exports between 2009-2013[3] (%, p.a.)**	**India's Share in world exports (%)**	**Ranking in world exports**
Fruit and Vegetable Food Preparations								
2001	Cucumbers, gherkins and onions preserved by vinegar	1941804	3%	171201	37%	4	8.8	3
2007	Jams,fruit jellies & marmalades	3132172	5%	113632	25%	11	3.6	8
2008	Preserved fruits	13454237	22%	101694	22%	10	0.8	25
2005	Prepared or preserved vegetables nes (excl. frozen)	10467227	17%	33498	7%	6	0.3	36
2004	Prepared or preserved vegetables nes (incl. frozen)	7601518	13%	24916	5%	9	0.3	19
2003	Mushrooms & truffles, prepared or preserved	1325421	2%	6668	1%	5	0.5	11
2009	Fruit & vegetable juices, unfermented	16772409	28%	6400	1%	8	0	75
2006	Sugar preserved fruits and nuts	749931	1%	1968	0%	8	0.3	20
2002	Tomatoes prepared or preserved	4769858	8%	1048	0%	3	0	58
Total		**60214577**	**100%**	**461025**	**100%**			

		GLOBAL		INDIA				
Code	**Product label**	**Global Export Value 2014(USD Thousand)**	**Product % share**	**Exported value 2014(USD thousand) from India**	**Product % share**	**Annual growth of world exports between 2009-2013 (%, p.a.)**	**India's Share in world exports (%)**	**Ranking in world exports**
Meat Products								
202	Meat of bovine animals, frozen	21565686	18%	4410954	92%	14	20.5	2
206	Edible offal of red meat	6923242	6%	154952	3%	15	2.2	14
204	Meat of sheep or goats - fresh, chilled or frozen	6363872	5%	120995	3%	7	1.9	7
201	Meat of bovine animals, fresh or chilled	21505322	18%	75598	2%	6	0.4	25

[3] Data for 2014 is not available for this indicator

207	Meat & edible offal of poultry meat	27069015	22%	7646	0%	9	0	53
210	Meat & edible meat offal	5129177	4%	132	0%	4	0	69
203	Meat of swine, fresh, chilled or frozen	30869751	26%	87	0%	7	0	62
208	Meat and edible meat offal nes	887727	1%	16	0%	1	0	74
Total		**120313792**	**100%**	**4770380**	**100%**			

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Dairy and Animal Products								
402	Milk and cream, concentrated or sweetened	24357362	26%	510055	70%	17	2.1	10
409	Natural honey	2056753	2%	75718	10%	11	3.7	9
408	Birds' eggs dried	1133936	1%	48654	7%	9	4.3	7
405	Butter and other fats and oils derived from milk	8262075	9%	42859	6%	13	0.5	19
407	Birds' eggs in shell	4256704	5%	30596	4%	10	0.7	21
406	Cheese and curd	32054879	35%	14314	2%	9	0	52
401	Milk and cream, not concentrated nor sweetened	9205599	10%	4420	1%	10	0	61
403	Buttermilk and yogurt	4793740	5%	3134	0%	7	0.1	57
404	Whey and natural milk products nes	5789284	6%	578	0%	23	0	56
410	Edible products of animal origin, nes	383197	0%	69	0%	9	0	35
Total		**92293529**	**100%**	**730397**	**100%**			

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Cereal Based Preparation								
1905	Bread, biscuits, wafers, cakes and	30314138	47%	301061	61%	9	1	24

	pastries							
1901	Malt extract; food preparations of flour, meal, starch or malt extract	18591293	29%	127481	26%	14	0.7	22
1904	Breakfast cereals & cereal bars	5884198	9%	39718	8%	5	0.7	26
1902	Pasta & couscous	8946433	14%	19713	4%	8	0.2	48
1903	Tapioca and substitutes therefore prepared from starch	89342	0.14%	3214	1%	14	3.6	7
Total		**63825404**	**100%**	**491187**	**100%**			

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Fat based products								
1515	Fixed vegetable fats&oils & their fractions	3911908	4%	806340	82%	13	20.6	1
1516	Animal or veg fats, oils&fract, hydrogenated	5531075	6%	68814	7%	9	1.2	13
1504	Fish/marine mammal,fat,oils&their fractions	1898990	2%	39881	4%	13	2.1	11
1518	Animal or vegetable fats & oils chemically modified; inedible mixtures	1957459	2%	30517	3%	21	1.6	15
1513	Coconut (copra),palm kernel/babassu oil & their fractions	4693020	5%	15134	2%	7	0.3	16
1508	Ground-nut	349567	0.36%	5540	1%	9	1.6	10

	oil&its fractions							
1514	Rape,colza or mustard oil & their fractions	8617818	9%	5479	1%	17	0.1	38
1505	Wool grease and fatty substances derived therefrom (including lanolin)	308255	0%	3840	0%	21	1.2	16
1512	Safflower,sunflower/cotton-seed oil&fractions	10228251	10%	2786	0%	19	0	56
1521	Vegetable waxes, beeswax & other insect waxes	364268	0%	2078	0%	16	0.6	19
1517	Margarine	6229050	6%	1743	0%	9	0	71
1507	Soya-bean oil&its fractions	10425309	11%	948	0%	8	0	60
1520	Glycerol (glycerine)	514071	1%	481	0%	40	0.1	35
1522	Degras and residues	154014	0%	339	0%	7	0.2	31
1509	Olive oil and its fractions	6661619	7%	127	0%	7	0	66
1511	Palm oil & its fraction	33462823	34%	99	0%	14	0	92
1510	Other oils from olives	424997	0%	19	0%	14	0	50
1502	Bovine,sheep& goat fats	1506222	2%	18	0%	-2	0	57
1501	Lard and other pig &poultry fat	982777	1%	17	0%	8	0	41
Total		**98221493**	**100%**	**984200**	**100%**			

Code	Product label	Global Export Value 2014(USD	Product % share	Exported value 2014(USD thousand)	Product % share	Annual growth of world exports between	India's Share in world	Ranking in world exports

		Thousand)		from India		2009-2013 (%, p.a.)	exports (%)	
Meat Preparations								
1602	Prepared or preserved meat, meat offal or blood, nes	15605127	32%	680	1%	9	0	80
1601	Sausages and similar products, of meat, offal or blood	5202289	11%	593	1%	9	0	70
1603	Extracts & juices of meat, fish, crustaceans & molluscs	209857	0%	373	0%	4	0.2	28
Total		**21017273**	**100%**	**1646**	**100%**			

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Sugar and Confectionery								
1701	Cane or beet sugar and chemically pure sucrose, in solid form	31578498	63%	966029	83%	9	3.1	5
1702	Sugars,nes,incl chem pure lactose etc; artif honey; caramel	6207909	12%	86282	7%	15	1.4	14
1704	Sugar confectionery (incl white choc), not containing cocoa	10935943	22%	76023	7%	8	0.7	34
1703	Molasses resulting from the extraction or refining of sugar	1059271	2%	33341	3%	8	3.1	13
Total		**49781621**	**100%**	**1161675**	**100%**			

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Cocoa Based Preparations								
180690	Chocolate and other food preparations containing cocoa	26022852	58%	62409	75%	12	0.5	28

	nes							
180400	Cocoa butter, fat and oil	3568115	8%	17580	21%	-6	0.5	21
180610	Cocoa powder, containing added sugar or other sweetening matter	NA	0%	789	1%	8	0.2	40
180631	Choc&food prep cntg cocoa in blocks,slabs/bars,filld,not exceedg 2 kg	NA	0%	758	1%	10	0	69
180620	Chocolate&other food preparations containg cocoa weighg more than 2 kg	NA	0%	494	1%	8	0	63
180500	Cocoa powder, not containing added sugar or other sweetening matter	2569802	6%	411	0%	17	0	48
180632	Choc &food prep cntg cocoa in blocks,slabs/bars,not filld,not over 2 kg	NA	0%	229	0%	10	0	78
180100	Cocoa beans, whole or broken, raw or roasted	10275329	23%	193	0%	4	0	57
180320	Cocoa paste wholly or partly defatted	2503097	6%	4	0%	17	0	40
180310	Cocoa paste not defatted	NA	0%	3	0%	6	0	61
180200	Cocoa shells, husks, skins and other cocoa waste	207464	0%		0%	-2	NA	NA
Total		**45146659**	**100%**	**82870**	**100%**			

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Miscellaneous Food Products								
2101	Extracts essences & concentrates of coffee and tea	8322502	13%	338142	60%	11	4.1	8
2106	Other Food preparations	34082765	55%	184696	33%	9	0.5	34
2103	Sauces mixed condiments & mixed seasonings	10833219	18%	35886	6%	8	0.3	45
2104	Soups, broths & preparations thereof	3250894	5%	4396	1%	6	0.1	59
2102	Yeast	1935132	3%	2980	1%	8	0.2	50
2105	Ice cream	3326009	5%	1424	0%	5	0	63

Total	**61750521**	**100%**	**567524**	**100%**	

Code	Product label	Global Export Value 2014(USD Thousand)	Product % share	Exported value 2014(USD thousand) from India	Product % share	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
Alcohol Products								
2207	Ethyl alcohol & other spirits (if undenatured then higher than 80% by	8661646	8%	194629	44%	19	2.2	10
2208	Spirits, liqueurs, other spirit beverages, alcoholic preparations	30259905	27%	188596	43%	10	0.6	22
2203	Beer made from malt	13442794	12%	34547	8%	6	0.3	36
2202	Non-alcoholic beverages (excl. water, fruit or vegetable juices)	17620130	16%	12134	3%	9	0.1	72
2204	Wine of fresh grapes	34551231	31%	7673	2%	7	0	52
2209	Vinegar and substitutes for vinegar	597702	1%	274	0%	13	0	53
2201	Mineral & aerated waters	3246957	3%	268	0%	6	0	88
2206	Fermented beverages, nes	1465388	1%	61	0%	17	0	82
2205	Vermouth&other grape wine flavoured with plants or aromatic substances	568780	1%	54	0%	5	0	59
Total		**110414533**	**100%**	**438236**	**100%**			

CHAPTER 5: THE FOCUS VALUE ADDED PRODUCTS

The preceding chapter has focused on analyzing the global trends in value added food products and the products in which India was performing well. The criteria for judging India's performance was the its individual ranking in the product in world trade in terms of value. However one of the key purposes of the study is also to indentify the future products in which India should focus. This is based on the understanding that in a market where India is already performing well or has major share of the market does provide possibilities further expansion. Whatever expansion would happen would depend on the natural growth of the market. The assumption here being India would maintain its market position. The key officials at APEDA have also expressed their concern in focusing on ethnic Indian products. IL&FS Clusters held discussion with its food processing industry associates to understand the future of such products. In this context, IL&FS Clusters had also attended a brainstorming session focusing on exports of value added food products from India organized by APEDA in collaboration with CII.

In this analysis, the same set of 84 identified products in the previous chapter was taken. The parameters for carrying out the analysis were as follows:

1. Exported value 2013 (in Rs. Crore) from India
2. As % of total India's exports
3. Annual growth of world exports in the period of 2009-2014 (%, p.a.)
4. India's Share in world exports (%)
5. Ranking in world exports

From the above analysis, the following products emerged as top ranked in terms of comprising of total exports from India in value (Rs Crore):

Sl No.	Product	Exported value 2013 (in Rs. Crore) from India	As % of total India's exports	Annual growth of world imports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
1	Meat of bovine animals, frozen	26465.724	45%	14	20.5	2
2	Cane or beet sugar and chemically pure sucrose, in solid form	5796.174	10%	9	3.1	5
3	Fixed vegetable fats&oils & their fractions	4838.04	8%	13	20.6	1
4	Milk and cream, concentrated or sweetened	3060.33	5%	17	2.1	10
5	Extracts essences & concentrates	2028.852	3%	11	4.1	8

	of coffee and tea					
6	Bread, biscuits, wafers, cakes and pastries	1806.366	3%	9	1	24
7	Ethyl alcohol & other spirits (if undenatured then higher than 80% by	1167.774	2%	19	2.2	10
8	Spirits, liqueurs, other spirit beverages, alcoholic preparations	1131.576	2%	10	0.6	22
9	Other Food preparations	1108.176	2%	9	0.5	34
10	Cucumbers, gherkins and onions preserved by vinegar	1027.206	2%	4	8.8	3
11	Edible offal of red meat	929.712	2%	15	2.2	14
12	Malt extract; food preparations of flour, meal, starch or malt extract	764.886	1%	14	0.7	22
13	Meat of sheep or goats - fresh, chilled or frozen	725.97	1%	7	1.9	7
14	Jams,fruit jellies & marmalades	681.792	1%	11	3.6	8
15	Preserved fruits	610.164	1%	10	0.8	25
16	Sugars,nes,incl chem pure lactose etc; artif honey; caramel	517.692	1%	15	1.4	14
18	Sugar confectionery (incl white choc), not containing cocoa	456.138	1%	8	0.7	34
19	Natural honey	454.308	1%	11	3.7	9

The above mentioned products comprise around 91 per cent of the total value added food products exported from India in terms of value.

Sl No.	Code	Product label	Exported value 2014 (USD thousand) from India	Exported value 2014 (in Rs. Crore) from India	As % of total India's exports	Annual growth of world exports between 2009-2013 (%, p.a.)	India's Share in world exports (%)	Ranking in world exports
1	202	Meat of bovine animals, frozen	4410954	26465.72	44.99%	14	20.5	2
2	1701	Cane or beet sugar and chemically pure sucrose, in solid form	966029	5796.17	9.85%	9	3.1	5
3	1515	Fixed vegetable fats &oils & their fractions	806340	4838.04	8.22%	13	20.6	1
4	402	Milk and cream,	510055	3060.33	5.20%	17	2.1	10

		concentrated or sweetened						
5	2101	Extracts essences & concentrates of coffee and tea	338142	2028.85	3.45%	11	4.1	8
6	1905	Bread, biscuits, wafers, cakes and pastries	301061	1806.37	3.07%	9	1	24
7	2207	Ethyl alcohol & other spirits (if under natured then higher than 80% by	194629	1167.77	1.99%	19	2.2	10
8	2208	Spirits, liqueurs, other spirit beverages, alcoholic preparations	188596	1131.58	1.92%	10	0.6	22
9	2106	Other Food preparations	184696	1108.18	1.88%	9	0.5	34
10	2001	Cucumbers, gherkins and onions preserved by vinegar	171201	1027.21	1.75%	4	8.8	3
11	206	Edible offal of red meat	154952	929.71	1.58%	15	2.2	14
12	1901	Malt extract; food preparations of flour, meal, starch or malt extract	127481	764.89	1.30%	14	0.7	22
13	204	Meat of sheep or goats - fresh, chilled or frozen	120995	725.97	1.23%	7	1.9	7
14	2007	Jams, fruit jellies & marmalades	113632	681.79	1.16%	11	3.6	8
15	2008	Preserved	101694	610.16	1.04%	10	0.8	25

		fruits						
16	1702	Sugars,nes,incl chem pure lactose etc; artif honey; caramel	86282	517.69	0.88%	15	1.4	14
17	1605	Crustaceans & molluscs, prepared/preserved	79520	477.12	0.81%	7	0.8	18
18	1704	Sugar confectionery (incl white choc), not containing cocoa	76023	456.14	0.78%	8	0.7	34
19	409	Natural honey	75718	454.31	0.77%	11	3.7	9
20	201	Meat of bovine animals, fresh or chilled	75598	453.59	0.77%	6	0.4	25
21	1516	Animal or veg fats, oils& fract, hydrogenated	68814	412.88	0.70%	9	1.2	13
22	180690	Chocolate and other food preparations containing cocoa nes	62409	374.45	0.64%	12	0.5	28
23	408	Birds' eggs dried	48654	291.92	0.50%	9	4.3	7
24	405	Butter and other fats and oils derived from milk	42859	257.15	0.44%	13	0.5	19
25	1504	Fish/marine mammal,fat,oils&their fractions	39881	239.29	0.41%	13	2.1	11
26	1904	Breakfast cereals & cereal bars	39718	238.31	0.41%	5	0.7	26
27	2103	Sauces mixed condiments & mixed	35886	215.32	0.37%	8	0.3	45

		seasonings						
28	1604	Prepared/preserved fish & caviar	35437	212.62	0.36%	11	0.2	42
29	2203	Beer made from malt	34547	207.28	0.35%	6	0.3	36
30	2005	Prepared or preserved vegetables nes (excl. frozen)	33498	200.99	0.34%	6	0.3	36
31	1703	Molasses resulting from the extraction or refining of sugar	33341	200.05	0.34%	8	3.1	13
32	407	Birds' eggs in shell	30596	183.58	0.31%	10	0.7	21
33	1518	Animal or vegetable fats & oils chemically modified; inedible mixtures	30517	183.10	0.31%	21	1.6	15
34	2004	Prepared or preserved vegetables nes (incl. frozen)	24916	149.50	0.25%	9	0.3	19
35	1902	Pasta & couscous	19713	118.28	0.20%	8	0.2	48
36	180400	Cocoa butter, fat and oil	17580	105.48	0.18%	-6	0.5	21
37	1513	Coconut (copra),palm kernel/babassu oil & their fractions	15134	90.80	0.15%	7	0.3	16
38	406	Cheese and curd	14314	85.88	0.15%	9	0	52
39	2202	Non-alcoholic beverages (excl. water, fruit or vegetable juices and mi	12134	72.80	0.12%	9	0.1	72

40	2204	Wine of fresh grapes	7673	46.04	0.08%	7	0	52
41	207	Meat&edible offal of poltry meat	7646	45.88	0.08%	9	0	53
42	2003	Mushrooms&truffles, prepared or preserved	6668	40.01	0.07%	5	0.5	11
43	2009	Fruit & vegetable juices, unfermented	6400	38.40	0.07%	8	0	75
44	1508	Ground-nut oil&its fractions	5540	33.24	0.06%	9	1.6	10
45	1514	Rape,colza or mustard oil & their fractions	5479	32.87	0.06%	17	0.1	38
46	401	Milk and cream, not concentrated nor sweetened	4420	26.52	0.05%	10	0	61
47	2104	Soups, broths & preparations thereof	4396	26.38	0.04%	6	0.1	59
48	1505	Wool grease and fatty substances derived therefrom (including lanolin)	3840	23.04	0.04%	21	1.2	16
49	1903	Tapioca and substitutes therefore prepared from starch	3214	19.28	0.03%	14	3.6	7
50	403	Buttermilk and yogurt	3134	18.80	0.03%	7	0.1	57
51	2102	Yeast	2980	17.88	0.03%	8	0.2	50
52	1512	Safflower,sunflower/cotton-seed oil&fractions	2786	16.72	0.03%	19	0	56

53	1521	Vegetable waxes, beeswax & other insect waxes	2078	12.47	0.02%	16	0.6	19
54	2006	Sugar preserved fruits and nuts	1968	11.81	0.02%	8	0.3	20
55	1517	Margarine	1743	10.46	0.02%	9	0	71
56	2105	Ice cream	1424	8.54	0.01%	5	0	63
57	2002	Tomatoes prepared or preserved	1048	6.29	0.01%	3	0	58
58	1507	Soya-bean oil&its fractions	948	5.69	0.01%	8	0	60
59	180610	Cocoa powder, containing added sugar or other sweetening matter	789	4.73	0.01%	8	0.2	40
60	180631	Chocolate &food preparation containing cocoa in blocks,s labs/bars, filled,not exceeding 2 kg	758	4.55	0.01%	10	0	69
61	1602	Prepared or preserved meat, meat offal or blood, nes	680	4.08	0.01%	9	0	80
62	1601	Sausages and similar products, of meat, offal or blood	593	3.56	0.01%	9	0	70
63	404	Whey and natural milk products nes	578	3.47	0.01%	23	0	56

64	180620	Chocolate&other food preparations containg cocoa weighg more than 2 kg	494	2.96	0.01%	8	0	63
65	1520	Glycerol (glycerine)	481	2.89	0.00%	40	0.1	35
66	180500	Cocoa powder, not containing added sugar or other sweetening matter	411	2.47	0.00%	17	0	48
67	1603	Extracts&juices of meat,fish, crustaceans & molluscs	373	2.24	0.00%	4	0.2	28
68	1522	Degras and residues	339	2.03	0.00%	7	0.2	31
69	2209	Vinegar and substitutes for vinegar	274	1.64	0.00%	13	0	53
70	2201	Mineral & aerated waters	268	1.61	0.00%	6	0	88
71	180632	Choc&food prep cntg cocoa in blocks,slabs/bars,not filld,not over 2 kg	229	1.37	0.00%	10	0	78
72	180100	Cocoa beans, whole or broken, raw or roasted	193	1.16	0.00%	4	0	57
73	210	Meat & edible meat offal	132	0.79	0.00%	4	0	69
74	1509	Olive oil and its fractions	127	0.76	0.00%	7	0	66
75	1511	Palm oil & its fraction	99	0.59	0.00%	14	0	92

76	203	Meat of swine, fresh, chilled or frozen	87	0.52	0.00%	7	0	62
77	410	Edible products of animal origin, nes	69	0.41	0.00%	9	0	35
78	2206	Fermented beverages, nes	61	0.37	0.00%	17	0	82
79	2205	Vermouth other grape wine flavoured with plants or aromatic substances	54	0.32	0.00%	5	0	59
80	1510	Other oils from olives	19	0.11	0.00%	14	0	50
81	1502	Bovine,sheep &goat fats	18	0.11	0.00%	-2	0	57
82	1501	Lard and other pig&poultry fat	17	0.10	0.00%	8	0	41
83	208	Meat and edible meat offal nes	16	0.10	0.00%	1	0	74
84	180320	Cocoa paste wholly or partly defatted	4	0.02	0.00%	17	0	40

For the final selection, the following three parameters were grouped together to identify the potential and future products:

1. Processed Food Trend Analysis of India during 2009-2014
2. Processed Food Trend Analysis Globally during 2009-2014
3. Top 10 value added food products exports from India in terms of value in 2014

They are explained briefly below:

4. **Processed Food Trend Analysis of India during 2009-2014**
   In this, the data set for the period of 2009-2014 was analyzed in terms of Compound Annual Growth Rate (CAGR) and the average for the same product during the same duration. This was

done both in terms of value and volume. 32 fastest growing value added product categories were identified.

The summary table is provided below.

SL No	All Products		CAGR	Average	CAGR	Average	Export Value per MT(Rs Lakhs)
	HS Code	Product Type	Quantity(MT)		Value(Rs. Lakhs)		
1	201	Fresh and Chilled Buffalo Meat	9%	9603.85	42%	19226.24	2.00
2	202	Frozen Meat	31%	920671.52	47%	1382477.21	1.50
3	2068	Fresh/Frozen/Chilled Offals	40%	1133.54	14%	1100.69	0.97
4	2064	Frozen offal swine meat	243%	49.35	144%	58.60	1.19
5	1603	Extracts & Juices of meat	57%	0.71	95%	6.11	8.63
6	1051	Live Birds	54%	381.80	69%	280.23	0.73
7	2071	Fresh/Chilled/Forzen Fowl	67%	4609.87	87%	3534.41	0.77
8	402	Milk & Milk products	62%	49855.72	76%	90861.49	1.82
9	403	Yoghurt/Butter Milk/Curdled Milk/Cream	36%	273.80	92%	570.78	2.08
4	7129	Dried Vegetables	45%	7312.17	68%	4593.73	5.87
10	8111	Berries, other fruits & nuts	26%	18463.43	43%	10512.57	0.57
11	2006 0000	Vegetables, Fruit, Nuts, Fruit-Peel & Other Parts Of Plants, Preserved By Sugar	-51%	4969.66	49%	716.00	0.14
12	200899	Squashes	83%	20443.2	94%	12192.35	0.60
13	7132 000	Chickpeas	37%	199718.43	44%	104047.63	0.52
14	7133	Beans	88%	1691.20	108%	1027.26	0.61
15	130232 30	Guargum Treated And Pulverised	28%	326966.79	82%	909595.51	2.78
16	130232 20	Guargum Refined Split	27%	74155.76	75%	149243.30	2.01
17	1701	Jaggery	22%	44398.13	33%	12868.01	0.29
18	1702	Syrups	20%	98145.75	25%	28696.23	0.29
19	1704	Confectionery	19%	41436.46	28%	29821.12	0.72

20	1805	Cocoa Powder without SM	101%	109.48	107%	186.93	1.71
21	1806	Cocoa Powder with SM	30%	9373.82	68%	17881.78	1.91
22	1103	Cereal Pellets	70%	459.66	105%	222.71	0.48
23	1104	Rolled/Flaked Cereals	46%	5222.24	71%	1801.79	0.35
24	1101	Wheat Flour	78%	149624.02	83%	33426.46	0.22
25	1103	Groats/Meal	44%	57373.20	56%	6780.72	0.12
26	1105	Potato powder/flakes/granules	47%	5772.55	74%	2074.41	0.36
27	1108	Starch	50%	3074.32	65%	24915.20	8.10
28	2106	Soft drink concentrates	-2%	17518.31	49%	7656.32	0.44
29	NA	Blended Whisky	105%	2940.08	86%	8532.64	2.90
30	NA	Gin	46%	394.50	55%	1239.03	3.14
31	22085	Vodka	83%	587.77	74%	1502.40	2.56

5. Processed Food Trend Analysis in the global context during 2009-2014

For this the top value added food products in the global context was analyzed in terms of value and product wise percentage share for 2014. This was further compared with India's trade in terms of value for the same period and each product's share in the total trade of India. This was further supplemented with the annual growth trend and India's share in world exports and rank as well for the particular product.

The summary table is provided below.

SL. No.	HS Code	Product Name	India's Rank in the category	Share(%) in Global Exports in 2014(Value)
1	1515	Fixed vegetable fats oils & their fractions	1	4%
2	202	Meat of bovine animals, frozen	2	18%
3	2001	Cucumbers, gherkins and onions preserved by vinegar	3	3%
4	1701	Cane or beet sugar and chemically pure sucrose, in solid form	5	63%

5	204	Meat of sheep or goats - fresh, chilled or frozen	7	5%
6	408	Birds' eggs dried	7	1%
7	1903	Tapioca and substitutes therefore prepared from starch	7	0.14%
8	2101	Extracts essences & concentrates of coffee and tea	8	13%
9	409	Natural honey	9	2%
10	2207	Ethyl alcohol & other spirits (if undenatured then higher than 80% by	10	8%
11	402	Milk and cream, concentrated or sweetened	10	26%
12	1508	Ground-nut oil its fractions	10	0.36%

6. Top 10 value added food products exports from India in terms of value in 2014

In this the analysis was carried out for the year 2014 to understand India's recent position in the exports of value added products. The percentage wise distribution of each product was derived from the total export basket of value added food products.

The summary table is provided below.

Sl No	Product Name	Exported value 2014 (in USD thousand) from India	As % of total India's exports	India's Share in world exports (%)
1	Meat of bovine animals, frozen	4410954	44.99%	20.5
2	Cane or beet sugar and chemically pure sucrose, in solid form	966029	9.85%	3.1
3	Fixed vegetable fats &oils & their fractions	806340	8.22%	20.6
4	Milk and cream, concentrated or sweetened	510055	5.20%	2.1

5	Extracts essences & concentrates of coffee and tea	338142	3.45%	4.1
6	Bread, biscuits, wafers, cakes and pastries	301061	3.07%	1
7	Ethyl alcohol & other spirits (if under natured then higher than 80% by	194629	1.99%	2.2
8	Spirits, liqueurs, other spirit beverages, alcoholic preparations	188596	1.92%	0.6
9	Other Food preparations	184696	1.88%	0.5
10	Cucumbers, gherkins and onions preserved by vinegar	171201	1.75%	8.8

On the basis of above analysis, the following potential and future products are having been identified for the study. A detailed discussion with APEDA and industry stakeholders was undertaken in this regard. The suggestions provided by the panel were taken into consideration while finalizing the list of products.

1. **POTENTIAL PRODUCTS**
   - i. Biscuits
   - ii. Dehydrated Onions and Garlic
   - iii. Fruit Juices & Concentrates
   - iv. Tapioca and Maize Starch
   - v. Frozen Peas and Vegetables
   - vi. Dried Potatoes(flakes, pellets, powder)
   - vii. Ethnic Food products & Papad
   - viii. Wine of Fresh Grapes
   - ix. Jam, Jellies and Marmalades
   - x. Confectionery(non-cocoa based)
   - xi. Sauces and Condiments

The overall metrics of the selected products are provided in the following table.

HS CODE	PRODUCT NAME	CAGR (%) EXPORTS FROM INDIA (2009-2014)	PRODUCT (%)SHARE GLOBALLY In 2014	ANNUAL GROWTH OF WORLD EXPORTS (%)	INDIA'S SHARE IN WORLD EXPORTS (%)
Cereal Preparations					
190590	Biscuits	33%	47%	8%	1%
Processed Fruit and Vegetable					
712200	Dehydrated Onions and Garlic	45%	3%	15%	37%
200990	Fruit Juices & Concentrates	4%	28%	8%	1%
110520	Dried Potatoes(flakes, pellets, powder)	80%	17%	6%	7%
190300	Tapioca and Maize Starch	39%	0.14%	14%	3.6%
710210	Frozen Peas and Vegetables	3%	13%	9%	5%
Other Processed Food					
210690	Ethnic Food products (other food preparations) including papad	23%	4%	6%	54%
170490	Confectionery(non-cocoa based)	28%	22%	8%	0.7%
210320	Sauces and Condiments	3%	18%	8%	0.3%
220421	Wine of Fresh Grapes	5%	31%	7%	2%
200799	Jam, Jellies and Marmalades	22%	5%	11%	4%

Source: http://www.trademap.org/Product_SelProductCountry.aspx

The competing countries for each of the above products are provided in the following table. Here, it may be noted here that in case of European Union countries particularly Germany, France, Italy and countries like United Kingdom, USA, they act as large importers as well as re-exporters.

Product Name	Competing Countries
Biscuits	Germany, Belgium, France, Italy, United States of America, Canada, Netherlands, United Kingdom, Poland, Turkey, Spain, Mexico, Austria, Sweden, Malaysia, Denmark, China, Czech Republic, Russian Federation, Ukraine, Thailand
Ready to Eat Ethnic Food Products including Papad(Other food preparations)	USA, Netherlands, Germany, France, China, United Kingdom, Belgium, Italy, Thailand, Denmark
Dehydrated Onions and Garlic	China, USA, Egypt, France, Spain, Poland, Hungary,United Kingdom, Netherlands, Germany
Fruit Juices &Concentration	Brazil, Netherlands, USA, Belgium, China, Germany, Spain, Poland, Italy, Thailand
Wine of Fresh Grapes	France, Italy, Spain, Chile, Australia, USA, Germany, New Zealand
Dried Potato products	Netherlands, Germany, USA, Belgium, Denmark, Poland, France, Canada, Egypt, UK, UAE
Jam, Jellies and Marmalades	France, Germany, Turkey, Belgium, Italy, Chile, Spain
Confectionary (Sugar Based)	Germany, Belgium, China, Netherlands, Mexico, Spain, USA, Canada, Turkey, Coloumbia, Poland, UK, France, Russian Federation, Italy, Switzerland, Korea, Indonesia, Sweden, Ireland, Slovakia, Hungary, Vietnam, Austria, Malaysia
Sauces and Condiments	USA, Netherlands, Germany, China, Italy, Thailand, Beligium, UK, Spain, France,Poland, Japan, Canada, Mexico, Austria, Korea, Malaysia
Tapioca and Maize Starch	China, Thailand, France, Indonesia

Source: http://www.trademap.org/Product_SelProductCountry.aspx

2. PRICE COMPETITIVENESS[4]

The price competitiveness for the above products is presented in the following table. The methodology adopted for arriving at the price competitiveness is as follows:

1. Calculating the global import price realization per metric ton: This has been arrived at by dividing the total imported value by the imported volume
2. Calculating India's export price realization per metric ton: This has been arrived at dividing the total exported value by the exported volume

[4] ITC Trademap

Product Name	Global Unit Price Realization(USD/MT)	India's Unit Price Realization(USD/ MT)	Difference In %	Target Countries
Biscuits	2827	724	74%	Angola, Australia, Benin, Bhutan, Burkina Faso, Cameroon, Canada, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Dominican Republic, Gambia, Ghana, Guinea, Haiti, Israel, Kenya, Kuwait, Madagascar, Malaysia, Mozambique, Namibia, Nepal, New Zealand, Oman, Qatar, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, South Africa, Sudan (North + South), Tanzania, United Republic of, Togo, Uganda, United Arab Emirates, United Kingdom, United States of America, Yemen
Dehydrated Onions and Garlic	4929	2087	58%	Australia, Belgium, Brazil, Bulgaria, Cameroon, Canada, China, Côte d'Ivoire, Denmark, Finland, France, Germany, Greece, Israel, Italy, Latvia, Lithuania, Mexico, Nepal, Netherlands, New Zealand, Nigeria, Norway, Philippines, Poland, Russian Federation, Saudi Arabia, Senegal, Slovenia, South Africa, Spain, Sweden, Switzerland, Ukraine, United Arab Emirates, United Kingdom, United

				States of America
Fruit Juices & Concentrates	1242	1498	-21%	Australia, Bangladesh, Bhutan, Brazil, Cambodia, Canada, Denmark, France, Germany, Italy, Japan, Jordan, Korea, Republic of, Kuwait, Malaysia, Maldives, Mauritius, Nepal, Netherlands, New Zealand, Russian Federation, Saudi Arabia, Seychelles, Singapore, Sri Lanka, United Arab Emirates, United Kingdom, United States of America, Uzbekistan
Tapioca and Maize Starch	1183	992	16%	Australia, Bahrain, Finland, Kuwait, Nepal, Netherlands, New Zealand, Oman, Qatar, Saudi Arabia, Tanzania, United Arab Emirates, United Kingdom, United States of America
Frozen Peas & Vegetables	1089	730	33%	Algeria, Australia, Bahrain, Belgium, Canada, Egypt, Germany, Iran, Islamic Republic of, Japan, Kuwait, Malaysia, Mauritius, Oman, Pakistan, Qatar, Russian Federation, Saudi Arabia, South Africa, Sri Lanka, United Arab Emirates, United Kingdom, United States of America
Dried Potatoes(flakes, pellets, powder)	1324	616	53%	Australia, Canada, Hong Kong, China, Indonesia, Iran, Islamic Republic of, Japan, Korea, Democratic People's Republic of, Madagascar, Malaysia, Mauritius, Nepal, New Zealand, Nigeria, Oman, Singapore, Somalia, Thailand, United Arab Emirates, United Kingdom, United States

				of America
Ethnic Food products including papad(other food preparations category)	4962	2701	46%	Afghanistan, Australia, Bangladesh, Canada, Germany, Hong Kong, China, Indonesia, Japan, Kenya, Korea, Republic of, Malaysia, Nepal, Netherlands, New Zealand, Nigeria, Oman, Philippines, Qatar, Romania, Saudi Arabia, Singapore, South Africa, Spain, Sri Lanka, Taipei, Chinese, Turkey, United Arab Emirates, United Kingdom, United States of America
Wine of Fresh Grapes	3167	16322	-415%	Angola, Benin, Bhutan, China, France, Ghana, Hong Kong, China, Indonesia, Italy, Japan, Maldives, Nepal, Netherlands, Nigeria, Singapore, Spain, Sri Lanka, Tanzania, United Republic of, United Arab Emirates, United Kingdom, United States of America, Viet Nam
Jam, Jellies and Marmalades	1944	970	50%	Algeria, Australia, Belgium, Canada, China, Denmark, Egypt, France, Germany, Indonesia, Iran, Japan, Kenya, Korea, Republic of, Kuwait, Malaysia, Nepal, Netherlands, Russian Federation, Saudi Arabia, Spain, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States of America, Yemen
Confectionery(non-cocoa based)	3170	1410	56%	Angola, Australia, Benin, Bhutan, Burkina Faso, Cameroon, Canada, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Gambia,

				Ghana, Guinea, Haiti, Israel, Kenya, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mozambique, Namibia, Nepal, Netherlands, Niger, Nigeria, Philippines, Senegal, Sierra Leone, Singapore, Sri Lanka, Tanzania, United Republic of, Togo, Uganda, United Arab Emirates, United States of America
Sauces and Condiments	2235	2251	-1%	Australia, Bahrain, Bangladesh, Canada, Egypt, Germany, Hong Kong, China, Jordan, Kuwait, Malaysia, Nepal, New Zealand, Nigeria, Oman, Philippines, Qatar, Saudi Arabia, Singapore, South Africa, Sri Lanka, Thailand, United Arab Emirates, United Kingdom, United States of America

Source: http://www.trademap.org/Product_SelProductCountry.aspx

3. EXPORT PROJECTIONS

The export projections have been carried out till year 2020. The methodology adopted is forecasting has been derived by allocating weight ages to the following three parameters:

a. CAGR in terms of exports from India
b. Product Share in global processed food trade
c. Annual Growth Rate in exports globally

The weight ages has been allocated after considerable deliberations and secondary research. It has been taken into consideration that the exports of processed food for the year 2014-15 have been around Rs. 31,000 crore. The overall exports for the food products from India have been growing at a CAGR of around 20% for the last 10 years. Hence, the future projections have been analysed based on the probable market space that may be available for the exports and thus have been estimated judiciously. Thus the maximum weightage has been provided from the category of "Annual Growth Rate in exports globally". The base year for the projections has been taken as 2014.

Product Name	CAGR in terms of exports from India	Product Share Globally	Annual Growth in world Exports of Processed Food	Export Value in 2014 in US $ Million	Projected 2015 in US $ Million	Projected 2016 in US $ Million	Projected 2017 in US $ Million	Projected 2018 in US $ Million	Projected 2019 in US $ Million	Projected 2020 in US $ Million
Biscuits	33%	47%	9%	188.25	258.09	353.83	485.05	664.91	911.45	1249.38
Dehydrated Onions and Garlic	45%	3%	15%	84.98	129.54	197.45	300.93	458.65	698.99	1065.27
Ethnic Food Products including Papad (Other Food Preparations)	23%	4%	6%	104.13	130.71	164.07	205.94	258.49	324.44	407.22
Fruit Juices and Concentrates	4%	28%	8%	6.86	7.35	7.87	8.43	9.02	9.65	10.33
Tapioca & Maize Starch	39%	0.14%	14%	76.80	111.86	162.92	237.27	345.53	503.18	732.75
Frozen Peas and Vegetables	3%	13%	9%	48.37	51.36	54.53	57.89	61.46	65.25	69.27
Dried Potato Products	80%	17%	6%	2.85	3.43	6.40	11.85	21.86	40.24	74.01
Wine of Fresh Grapes	5%	13%	7%	6.88	7.41	7.97	8.58	9.24	9.94	10.69
Jam, Jellies and Marmalades	22%	5%	11%	110.43	139.78	176.93	223.95	283.45	358.76	454.07
Confectionery(non-cocoa based)	28%	22%	8%	76.86	101.09	132.95	174.84	229.91	302.33	397.54
Sauces and Condiments	3%	18%	8%	36.41	38.54	40.78	43.16	45.68	48.34	51.16
Total				**742.81**	**979.14**	**1305.68**	**1757.87**	**2388.18**	**3272.57**	**4521.69**

Data Source: APEDA, ITC Trademap
Weight ages:
CAGR in terms of exports from India: 33%
Product Share Globally: 33%
Annual Growth in world Exports of Processed Food: 34%

Mathematical Formula used for Forecasting:[{ Value of Base Year x (Weight Assigned x CAGR in terms of exports from India) + (Weight Assigned x Global Product Share) + (Annual Growth in world Exports of Processed Food x Weight Assigned)}+ Value of Base Year] x [1+ CAGR in terms of exports from India].

4. COUNTRY WISE EXPORT POTENTIAL

The export potential for the above products by year 2020 has been summarized in the following table for 91 countries. The methodology for determining the export is potential was based on the individual products share in the target countries total food imports. The data is based on ITC TradeMap which has been used throughout the report for inferring various parameters. The following table provides the country wise, product wise breakup till year 2020.

Sl. No.	Importers	Biscuits	Ethnic Food(Including Papad)	Dehydrated Onions and Garlic	Fruit Juices and Concentrates	Tapioca and Maize Starch	Wine of Fresh Grapes	Frozen Peas and Vegetables	Dried Potato	Jam, Jellies and Marmalades	Confectionery	Sauces and Condiments
1	Afghanistan	0.00	3.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Algeria	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	5.92	0.00	0.00
3	Angola	107.50	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	33.59	0.00
4	Australia	36.29	31.59	13.85	0.10	13.90	0.00	3.13	5.01	4.57	3.10	5.52
5	Bahrain	0.00	0.00	0.00	0.00	7.77	0.00	0.69	0.00	0.00	0.00	0.55
6	Bangladesh	0.00	40.51	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.56
7	Belgium	0.00	0.00	51.09	0.00	0.00	0.00	3.06	0.00	3.50	0.00	0.00
8	Benin	9.75	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	23.65	0.00
9	Bhutan	35.90	0.00	0.00	0.61	0.00	0.23	0.00	0.00	0.00	2.97	0.00
10	Burkina Faso	12.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.20	0.00
11	Brazil	0.00	0.00	49.36	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Bulgaria	0.00	0.00	7.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	Cambodia	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	Cameroon	22.39	0.00	16.22	0.00	0.00	0.00	0.00	0.00	0.00	24.09	0.00
15	Canada	29.41	25.89	23.56	0.36	0.00	0.00	2.92	0.92	6.00	2.20	1.10

16	Congo	40.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.91	0.00
17	Côte d'Ivoire	15.16	0.00	15.76	0.00	0.00	0.00	0.00	0.00	0.00	2.82	0.00
18	China	0.00	3.17	6.47	0.00	0.00	0.06	0.00	0.00	18.41	0.00	0.82
19	Democratic Republic of the Congo	9.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32	0.00
20	Denmark	0.00	0.00	6.00	0.15	0.00	0.00	0.00	0.00	4.18	0.00	0.00
21	Dominican Republic	14.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	Egypt	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	3.46	0.00	1.88
23	Finland	0.00	0.00	8.51	0.00	4.50	0.00	0.00	0.00	0.00	0.00	0.00
24	France	0.00	0.00	40.44	0.06	0.00	0.67	0.00	0.00	9.28	0.00	0.00
25	Germany	0.00	3.26	200.77	0.15	0.00	0.00	0.64	0.00	8.93	0.00	0.29
26	Greece	0.00	0.00	8.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	Gambia	10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.18	0.00
28	Ghana	18.22	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	10.87	0.00
29	Guinea	23.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.04	0.00
30	Haiti	70.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.57	0.00
31	Hong Kong	0.00	2.45	0.00	0.00	0.00	0.18	0.00	1.53	0.00	0.00	0.00
32	Indonesia	0.00	2.52	0.00	0.00	0.00	0.18	0.00	1.77	5.45	0.00	0.00
33	Israel	8.04	0.00	16.65	0.00	0.00	0.00	0.00	0.00	0.00	2.52	0.00
34	Italy	0.00	0.00	16.09	0.22	0.00	0.05	0.00	0.00	0.00	0.00	0.00
35	Iran	0.00	0.00	0.00	0.00	0.00	0.00	0.44	4.93	38.64	0.00	0.00
36	Latvia	0.00	0.00	6.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	Lithuiana	0.00	0.00	26.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	Japan	0.00	2.39	0.00	0.34	0.00	0.59	0.39	1.16	36.53	0.00	0.00
39	Jordan	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.45
40	Kenya	26.04	4.94	0.00	0.00	0.00	0.00	0.00	0.00	4.34	7.01	0.00
41	Korea, Republic of	0.00	6.71	0.00	0.25	0.00	0.00	0.00	0.46	7.95	0.00	0.00
42	Kuwait	9.87	0.00	0.00	0.32	10.63	0.00	1.41	0.00	4.02	0.00	1.52

43	Madagascar	8.64	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	3.45	0.00
44	Malawi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.21	0.00
45	Malaysia	21.77	9.13	0.00	0.51	0.00	0.00	0.50	8.17	2.77	4.96	1.26
46	Mali	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00
47	Maldives	0.00	0.00	0.00	0.06	0.00	0.73	0.00	0.00	0.00	0.00	0.00
48	Mauritius	0.00	0.00	0.00	0.12	0.00	0.00	0.49	1.27	0.00	0.00	0.00
49	Mauritiana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.49	0.00
50	Mexico	0.00	0.00	9.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	Mozambique	13.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.16	0.00
52	Namibia	18.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13	0.00
53	Nepal	56.85	39.51	17.33	0.58	179.10	0.16	0.00	1.33	4.32	50.08	2.37
54	Netherlands	0.00	4.19	33.80	1.45	56.43	0.43	0.00	0.00	112.18	11.30	0.00
55	New Zealand	8.15	5.02	11.89	0.09	4.09	0.00	0.00	1.52	0.00	0.00	0.32
56	Niger	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.64	0.00
57	Nigeria	0.00	3.98	15.09	0.00	0.00	0.60	0.00	0.58	0.00	20.17	8.64
58	Norway	0.00	0.00	5.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	Oman	12.13	2.45	0.00	0.00	34.35	0.00	1.59	1.40	0.00	0.00	0.73
60	Pakistan	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00
61	Phillippines	0.00	7.96	6.74	0.00	0.00	0.00	0.00	0.00	0.00	4.33	0.63
62	Poland	0.00	0.00	39.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
63	Qatar	11.03	3.23	0.00	0.00	58.47	0.00	0.69	0.00	0.00	0.00	0.85
64	Rwanda	7.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	Romania	0.00	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	Russia	0.00	0.00	64.72	0.09	0.00	0.00	5.18	0.00	8.61	0.00	0.00
67	Saudi Arabia	20.38	24.12	9.91	0.45	121.85	0.00	15.77	0.00	48.46	0.00	1.87
68	Senegal	15.96	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	7.79	0.00
69	Slovenia	0.00	0.00	9.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	Sierra Leone	9.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00
71	Seychelles	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00

72	Singapore	17.68	9.45	0.00	0.39	0.00	0.08	0.00	1.70	0.00	4.07	0.98
73	South Africa	10.05	2.96	42.60	0.00	0.00	0.00	0.71	0.00	0.00	0.00	0.27
74	Sudan (North + South)	27.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	Somalia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.74	0.00	0.00	0.00
76	Spain	0.00	2.40	31.11	0.00	0.00	0.26	0.00	0.00	3.00	0.00	0.00
77	Sri Lanka	0.00	9.93	0.00	0.06	0.00	0.98	3.21	0.00	0.00	3.39	0.57
78	Sweden	0.00	0.00	12.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	Switzerland	30.80	0.00	25.54	0.00	5.72	0.06	0.00	0.00	0.00	13.01	0.00
80	Tanzania, United Republic of	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	0.00	0.00	1.34
81	Thailand	0.00	3.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	Turkey	22.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.37	0.00
83	Togo	53.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.52	4.26	0.00
84	Uganda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.69	0.00	0.00
85	Ukraine	78.26	35.06	10.33	0.38	132.48	1.90	6.54	6.86	23.75	36.95	6.35
86	United Arab Emirates	130.82	19.54	10.62	1.81	41.30	0.75	9.86	3.88	39.35	0.00	5.71
87	United Kingdom	161.41	95.86	97.37	1.21	62.15	0.31	9.76	6.58	38.11	10.80	6.60
88	United States of America	0.00	0.00	89.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	Uzbekistan	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00
90	Vietnam	13.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.16	0.00	0.00
91	Yemen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

All Values are in US $ Million

CHAPTER 6: ANALYSIS OF THE INDENTIFIED VALUE ADDED PRODUCTS

This chapter focuses on the identified value added food products in terms of production/raw material availability, productivity, technology and quality standards. The technological adoptions suggested for certain products may be also applicable for other products, for example retort packaging.

In terms of production, for the assessed raw materials the following table showcases India's strength in terms of production:

Sl No	Production	Production(MTs)	Rank	Lead Country
1	Wheat	95,850,000	3	EU-27, China
2	Onions	8178300	2	China
3	Garlic	12,59,000	1	India
4	Fruits	74,878,000,000,000	2	China
5	Vegetables	121,015,200	2	China
6	Maize	23,500,000	7	USA
7	Cassava	8,746,500	10	Nigeria
8	Potato	45,343,600	2	China
9	Grapes	2,267,680	9	China
10	Tomatoes	18,227,000	2	China
11	Spices	1,525,000	1	India
12	Blakgram(Pulses)	1,900,000	1	India

Source: APEDA, Knoema, FAOSTAT, US Department of Agriculture

Sl No	Products	Primary Raw Material	Productivity in India(MT/Ha)	Benchmark productivity(MT/Ha)	Difference
1	Biscuits	Wheat	2.67	2.72	-2%
2	Dehydrated Onions and Garlic	Onions	14.2	22	-35%
		Garlic	5.69	23.53	-76%
3	Fruit Juices & Concentrates	Fruits	11.7	16.1	-27%
4	Tapioca and Maize Starch	Cassava	34.37	14.21	142%
		Maize	2.43	9.6	-75%
5	Frozen Peas and Vegetables	Peas	9.1	5.08	79%
		Vegetables	13.17	19.18	-31%
6	Dried Potatoes(flakes, pellets, powder)	Potato	22.72	38.59	-41%
7	Wine of Fresh Grapes	Grapes*seedless	10	6.5	35%
9	Sauces and Condiments	Tomatoes	30	40	-25%
		Ginger	15	0	NA

		Chilli	1.5	3	-50%
		Turmeric	4	0	NA
		Cardamom	1.3	0	NA
		Coriander	0.65	0	NA
10	Papad	Blackgram*	0.5	4.5	-89%

Source: US Global Agriculture Information Network(GAIN) reports, ICRISAT
****http://farmer.gov.in/imagedefault/pestanddiseasescrops/pulses.pdf***

IMPROVING PRODUCTIVITY

Sl No	Product	Measures to be taken
1	Wheat	1. Germplasm improvement: Introduction of hybrid seeds which are better yielding 2. Introduction of conservation agriculture
2	Onions	1. Introduction of better quality seeds in onions 2. Change in cultivation technique from flat bed system to raised bed system so as to enable drip irrigation for optimum irrigation
3	Garlic	1. Seed Improvement 2. Reduce storage losses
4	Fruits	1. Improving the quality of planting materials through introduction of tissue culture labs and germplasm improvement
5	Maize	1. Introduce Single Cross Hybrid Seeds (SCH). USA has the highest productivity when compared with the global average of 5.5 MT/hectare due to 85 per cent of the area under BT-SCH and remaining 15 per cent under SCH seeds backed by temperate climate and long duration crop. The yield in EU nations is as high as 6.6 MT/hectare due to 100 per cent area under SCH. In India, Andhra Pradesh has the highest yield followed by Tamil Nadu due to majority of the area being covered under Single Cross Hybrids (SCH)
6	Vegetables	1. Introduction of High Yielding Varieties
7	Potato	1. Potato requires a well-drained, well-aerated, porous soil with pH of 5 to 6, hence adoption of drip irrigation and fertigation needs to be done by the farmers.
8	Tomatoes	1. Adoption of plastic mulching, drip irrigation& fertigation techniques by farmers
9	Pulses (Blackgram)	1. Introduce varieties like CO6 and Vamban 6 and seed drilling cultivation practices

In the next section, the study will discuss on the technological requirements for the products. They are as follows:

Biscuits

In India a conventional and easy process is followed for biscuit manufacturing. Wheat flour along with other ingredients is mixed with water and dough is prepared. Then it is kept at a normal room temperature for about couple of hours to allow proper fermentation. Then it is placed in biscuit molding trays and these trays are placed in oven for baking. After requisite baking, trays are taken out, cooled and biscuits are packed. However to be competitive in the global market, it is imperative that India standardizes it

manufacturing process. The top exporting placed countries in this segment follows highly standardized production lines according to different product types. This is explained below.

There is a need of installing different product lines by product type. The different product types are as follows:

i. **Hard biscuit/cracker production lines:** The process route for the production of hard biscuits or crackers starts with the dough-making. This is followed by the dough lamination and gauge rolling. After that, the products pass through a rotating cutting machine. The next stage involves an SNK tunnel oven or a suitable oven combination. Finally, the products are conveyed to the packaging machines via a cooling conveyor and stacking unit.

ii. **Soft biscuit production lines**: The process route for producing soft biscuits starts with making the doughs. This is followed by dough feeding, dough moulding and placing the dough strip on a steel belt. The next stage involves an SNK tunnel oven. Finally, the biscuits are conveyed to the packaging machines via a cooling conveyor and stacking unit.

iii. **Pretzels and lye bath articles production lines:** The process route for producing lye bath articles is started by portioning the filling mass volume and the extrusion process. Cutting groups or biscuit molding machine comprise the following step. The final topping of the products is carried out in the lye bath which incorporates a salt applicator and a cutting machine. The next stage is an SNK tunnel oven.

iv. **Rusk production lines**: The process route for producing rusk starts with making the doughs. This is followed by dough feed and moulding steps. The dough is proofed and baked in tin moulds. Once baking has been concluded, the bread bars are released from their moulds, cooled and then cut to slices. The slices are toasted in a second baking process and conveyed to the packaging.

Ready to Eat Ethnic Indian Food products, Frozen

Whereas the segment has shown promising growth, the Indian exporters have to follow strict quality parameters to exploit overseas markets. The primary challenge is in the technology used for such products in which Retort Packaging

Retort Packaging

The water RETORT is an equipment or sterilization module through which steam (at 130 degree centigrade for 25 minutes) is applied on food products packed in retort pouches. The retorts use water or steam / air combination as processing medium to heat the container/packages. Compressed air or additional steam is introduced during the processing cycle to provide the overpressure (any pressure

supplied to the retort in excess of that which can be normally achieved under steam at any given retort temperature). Overpressure is important in preventing package damage or loss of seal integrity (like bursting), during the heating process. Retort pouches is a flexible packaging material that basically consist of laminates or bounded layers of different packaging films of Polyster- Nylon-Aluminium-polypropylene that can withstand high process temperature & pressure. Their most important feature is that, they are made of heat resistant plastics unlike the usual flexible pouches. This makes the retort pouches unique which are suitable for the processing of food contents at temperatures around 120 degrees Celsius.

Advantages of Retort Packaging

1. Pouch laminates permits less chance to overcook during the retorting thus products having better color, texture & less nutrients loss.
2. It requires less energy for sterilization.
3. It requires less disposal & storage space.
4. Low oxygen & moisture permeability.
5. Shelf stable for longer time & requires no refrigeration.
6. Sun light barrier, light weight, easy to open.

Papad

About 95% of the production of papad in the country is prepared at household level or in cottage scale, by traditional method using rolling pin for rolling the dough. This is time consuming and laborious. CFTRI has developed a simple inexpensive leg/hand operated press to make about 500 papads/hour from dal flour dough. The thickness of the papads can be altered in the machine by adjusting the clearance between the discs. Being leg/hand operated it is simple and easy to operate. This machine can be adopted for cottage scale production of papads. Raw materials required for papad making are locally available in rural areas. Urad dal, any pulse flour, salt, farinaceous material and spice mix are required. The papad industry has a good scope for marketing. Papads are exported to 42 countries from India. The preparation of papad consists of dough making using pulse flour (preferably urad dhal), salt, carbonates, farinaceous material and water. The dough is kneaded made into small balls and pressed into 1 mm thickness using the above papad press. The pressed circular shaped papad is dried to 14-15% moisture level. The above process can easily be done at village level as it involves low investment. One can have 2 papad presses for having a working capacity of 50 kg/day. The following technological requirements are necessary for papad making:

a. **Dough Machine (Floor Kneading Machine):** Adequate quantity of water is added in flour of pulses, common salt, spices and sodium bicarbonate and homogenous mixing is done to obtain dough. This machine would consist of heavy-duty stainless steel body with multi-purpose arms. Heavy-duty gears are providing to take the full load and to avoid damage to the mixer arms.

b. **Dough Sheeter with rotary die cutting unit:** Dough sheeter consists of a heavy- duty frame with gauging rollers driven with gearbox arrangement. The distance between the gauging rollers are adjustable depending on the desired thickness of the Papad, mathiya, cholafali.

c. **Rotary cutting unit of Papad Making Machine:** A rotary cutting unit is fitted on a roller for smooth and accurate cutting of Papad as per the desired sizes.

d. **Continuous Dryer for Papad:** An electric or LPG or CNG or Diesel continuous drier is used to dry the Papad.

Dehydrated Onions and Garlic

Dried onion products are produced in several forms: flaked, minced, chopped and powdered. Dried onions are used as flavor additives in wide varieties of food formulations such as comminuted meats, sauces, soups, salad dressings, pickles and pickle relishes. The technique of drying is probably the oldest method of food preservation practiced by mankind for the extension of food shelf life. The use of artificial drying to preserve agricultural commodities is expanding, creating a need for more rapid drying techniques and methods that reduce the large amount of energy required in drying processes. New and innovative techniques that increase drying rates and enhance dried onion quality are receiving considerable attention. The major quality problems faced during onion drying are loss of flavor, discoloration and poor rehydration characteristics of the dried onions. Onion flavor and color are generally perceived as important quality attributes. Quality changes during the drying process are influenced by drying temperatures. The volatile compounds responsible for the aroma and flavor of onions exhibit low boiling points and, accordingly, are often lost during high temperature drying. The process of manufacturing of dehydrated onions is shown below:

Activities	Explanation
	The fresh onions are pilled and then washed with medicated water containing 10 ppm chlorine.
	Washed onions then sent for cutting through conveyer belt.
	The onion chips are loaded on the Stainless Steel Dryer Belts through conveyer belt system. The automatic dryer belts ensure the required dehydration without affecting the taste of the onion.
	The material after the first round of drying are sent for binary dryers to reduce the moisture content.
	After the binary dryers the material goes to air conditioned rooms where in it is passed through huller machine to grade the material by size i.e. flakes, powder, chips etc.
	The final product is then passed through Auto Sortex .....

	.....and Metal Detector to ensure desired quality product.
	The material is then sealed in air tight bags to preserve it properly. Secondary packing of corrugated boxes is provided on buyer's request.

Fruit Juices &Concentrates

India ranks 2nd in terms of fruit production globally. However, the cost of inflation severely harms the fruit juice sector and also the potential for exports. This has primarily happened because of high wastage and lack of adequate storage technologies. India also lacks behind in terms of packaging technology, primarily for juices. North America and Europe are the two largest juice markets. While recent years have seen a decline in North American consumption of 100 % juices, the European market shows a steady increase and sales volumes in both regions are now at some 11 billion liters per year. Most fruit based beverages are sensitive to oxidation, which results in losses of vitamins and unfavourable changes in taste and colour. The rate of oxidation, and thus quality degradation, is not only determined by the gas barrier properties of the container itself, but by the total oxygen exposure. As a result, it has been seen that PET bottle packaging provides a number of advantages in terms of quality which in turn reduces the oxidation process. The following technologies are now introduced in PET bottling methods to enhancing the taste and quality of fruit juices and concentrates.

1. The first technology is Glaskin, a proprietary technology that coats the inside of blown PET bottles with a thin crystal-clear glass-like layer of silicon oxide (SiOx) and is said to provide superb gas-barrier characteristics and flavor retention performance. In customer shelf-life tests Glaskin coating has shown excellent oxygen and carbon dioxide barrier properties, and, because it is inert in contact with food, the potential for scalping and flavor absorption are reduced. Customer shelf-life requirements, depending on products and countries, have ranged from four to 12 months.
2. Over-Injected Barrier Layer: The other new product, Sealica, is also a proprietary technology, using a patented injection overlay process to injection-mold a high-barrier polymer layer onto

PET preforms. The proprietary barrier material is a thermoplastic epoxy resin, supplied through a strategic alliance between Tetra Pak and The Dow Chemical Co. Dow will sell the barrier material under the trademark BLOX Resins. The single over-injected barrier layer on PET preforms can be varied in thickness to give the final bottle more or less barrier potential, based on individual customer needs. Sealica technology uses specialized equipment and processes to first injection-mold a PET preform and then, on the same platen, over-inject a single layer of the proprietary barrier material, BLOX.

Wine of Fresh Grapes

India's expanding wine industry is in the midst of a vital transition. Last year, the country's wine production hit a record 17 million liters, with export sales rising 36 percent year-on-year to reach US$4.4 million in the first 7 months. With a rapidly growing export sector, expanding domestic consumer market and increasing industry support in major wine-producing States, the Indian wine industry has potential to be a global market competitor.

Bottling Technology[5]

In the entire process of wine bottling the segment of filling is the most important subject. When filling wine several quality parameters are important to be controlled in order to make sure your wine is well bottled and packaged. The main parameters are:

1. Dissolved oxygen pick-up (DO)
2. Fill-height accuracy and
3. Cork placement

As a first step, bottles are cleaned either with water or dry, compressed, sterile air. On a rotary rinser bottles are turned 180 degrees and a nozzle enters the neck to either spray water or air into the bottle. In the second step on the rinser, the bottle is sprayed with an inert gas such as nitrogen or argon to reduce the amount of oxygen in the bottle. This process is used mainly with conventional filling technologies which do not offer specific air/gas management as part of the filling process. After the bottle enters the filler from the rinser a centering bell seals the bottle. The filler program now initiates multiple process steps performed through the electro-pneumatically controlled valve. As a first step a vacuum is pulled on the bottle which extracts the ambient air or air/nitrogen mix through a separate channel of the filling valve to the outside environment; then the bottle is filled with inert gas. This is an advanced step compared to conventional filling systems which fill either against ambient air or an air/nitrogen mix from sparging at the rinser. The fact that the air is discharged to the environment is also very important; older technologies

[5] **http://www.peregrinemobilebottling.com/PMB_-_Latest_Developments_in_Wine_Filling_Technologies.pdf**

actually vented the air from the bottle into the filler bowl which resulted into increased DO pick-up values. The end of the filling process is determined by the contact of the wine with the vent tube. Once the wine channel is closed a short settling phase sets in. In order to achieve highest tolerances in fill level accuracy a fill-level correction process is applied. This effectively uses pressurized inert gas – applied to the headspace – to push excess product back into the bowl. With this step an accurate fill level is achieved which also results in product savings. After the bottle is released from the filling valve it is conveyed to either the corker or capper. Headspace management after the filling process is of utmost importance. Pulling a vacuum may potentially result in a contamination issue at the corker if at times wine is sucked into the vacuum system. As an alternative process headspace flushing with inert gas is also a high-quality solution. With a fill-height corrected application and a well placed cork the headspace pressure will be well controlled. Using this scenario no vacuum is pulled at the corker. Screw cap applications are a little more involved since the headspace volume is bigger than with cork applications. Ideally you want to remove the air or air / nitrogen gas mix which resides in the headspace. This is done by dosing liquid nitrogen to the headspace of the bottle. A liquid nitrogen dosing equipment is located close to the location where the bottle leaves the filler valve. Liquid nitrogen needs a certain amount of time to react and push the air out of the headspace; you will actually see a nitrogen "fog" or "smoke" develop in the headspace slightly coming out of the bottle if the dosage is correct. Therefore, a specifically determined amount is dosed into the bottle headspace. The liquid nitrogen reaction happens while the bottle is conveyed to the capper. Since the caps themselves are hollow they do carry air. If you place them on the bottle most of the air actually escapes in the process of pushing the cap onto the bottle; however, to avoid any residual air a nitrogen gas purging of the cap may be applied.

Frozen Peas and Vegetables

IQF technology makes the freezing process very fast, decreasing the size of ice crystals formed inside fruit tissue thus reducing cell structure damage. In this process, a flow of air is blown at a very low temperature that makes every piece of fruit float in the air getting individually frozen rapidly. The vegetables are also frozen in air blast tunnel (chamber freeze) in which cold air at –40 degree C is rapidly moved around the product giving it a cryogenic shock and freezing it instantly. IQF also improves freshness, taste and nutritional characteristics of fruits in comparison with a slow freezing process. This quick freezing technology let us enjoy the taste of seasonal fruits during the whole year.

Potato products

An important feature of realizing higher yields and returns in potato flakes industry is the separation of lumps before the product goes for drying. Leading potato flakes exporting countries like Germany and European countries use separators in the production line of flake products which increases the yield. The cooked product gets mashed and separated with the separator before the clean mash goes onto the drum dryer. With this new process step a significant yield improvement is achieved. Indian manufacturers must adopt such technologies to realize more returns in the export markets.

Jam, Jellies and Marmalades[6]

Making fruit pastes with a high percentage of sugar concentration is a traditional way of naturally preserving and storing fruit. A high concentration of sugar slows the generation of microorganisms, and the boiling process pasteurizes the fruit - extending its shelf life. Jam, Squash, Jellies, Marmalade and Fruit Paste factories require complex operations. Strict quality control and regulations are enforced and need to be adhered to for the product to be distributed to the mass market. Fruit pulps and other fruit side products resulting from the production of juices can be used for Jam, Squash, Jellies, Marmalade making. Manufacturers of Jam, Squash, Jellies and Marmalade usually buy fruit concentrates in industrial packages. There are some but few that produce them straight from fresh fruit processing. As a general rule the process consists of boiling fresh and/or pre-cooked fruits or pulp with a high concentration of sugar and pectin. Citric acid can also be added to further preserve the product and extend its shelf life. A high percentage of water has to be evaporated to form the highly concentrated paste, and ingredients have to be mixed rigorously in the mixing units before being pasteurized and then filled and packed. Hot filling technology is most commonly used for packaging of jam, jellies and marmalades around the world. The same technology is used in India too.

However, fruit spreads that limit added sugars are becoming especially popular. The most promising trend that is being observed is sugar-free jam sweetened with xylitol. One way to cut down on sugar is to use a slow-simmering technique to jell preserves instead of pectin. Since pectin sets preserves quickly, while they still contain a lot of water, more sugar is needed to sweeten the end result.

Confectionary (Sugar Based)[7]

The primary challenge of the sugar confectionery industry is to maintain the product's stability. Particularly, the Indian sugar confectionery industry is hampered by multiple factors like the following:

Environment

[6] ***https://www.specialtyfood.com/news/article/flavorful-world-fruit-spreads/***

[7] ***Source:http://www.confectionerynews.com/Ingredients/Sour-flavors-and-sweet-spicy-mixes-the-vogue-for-candy-and-gum-says-Leatherhead***

The environment, especially a problem in hotter climates, has a significant impact on the stability of confectionery products. In regions such as Asia and Latin America, the control of air humidity and temperature during manufacturing and storage is essential to maintaining high standards of finished products. In hard boiled candies, exposure to high temperatures and moisture can significantly impact the product's stability by speeding up sugar inversion, resulting in a sticky surface that is unacceptable to discerning consumers. Similarly, acid sanded jellies and gums attract moisture from their surroundings, which is accelerated at increased temperatures and humidity. This hygroscopicity results in a 'wet' appearance with impaired visual appeal, as well as acid migrating (from the exterior) into the candy. As a result the jellies or gums lose their instant sour taste effect and the acid may even impact the quality of the candy base.

Packaging

Package design and construction play a significant role in determining the shelf life of confectionery products. The right selection of packaging material, for example, is imperative to ensure an effective barrier against moisture in the environment. If the barrier is too weak, moisture from the environment will easily migrate into the candies. At the same time, seal integrity is of equal importance in creating an inert barrier and is usually determined by the effectiveness of the technologies used to create the packaging.

Achieving the desired sourness

In confectionery, sourness has always been used as a basic taste component to offset the otherwise intense sweetness of sugar. As a result, acidulants, particularly citric acid, are widely used across the industry to improve flavor profiles. A leading research organization. Mintel analysed the following flavors for the confectionery industry

1. Strawberry
2. Mixtures of sweet and spicy flavors such as orange and chilli, cinnamon and orange, salted caramel and chocolate chilli
3. Sour flavored chews like Grape, Apple, Lemon and Lime

Sauces and Condiments[8]

Condiment sauces are an important part of traditional multi cuisine as it adds extra taste and flavor to the dishes. Growing consumer interest towards different taste preferences and changing eating habits are increasing the demand for condiment sauces. Globally, Asia Pacific led the condiments sauces market followed by North America. Busy lifestyle and spurt in the number of working population is fueling the demand for condiment sauces in the U.S., Japan, China, Germany and Brazil among other countries.

[8] ***http://www.prnewswire.com/news-releases/condiment-sauces-market---global-industry-analysis-size-share-growth-trends-and-forecast-2014---2020-300032943.html***

Preparing different multi cuisine food at home has increased the usage of condiments sauces globally. The global condiments sauces market has been segmented by five types of condiments sauces such as chili/hot sauce, brown sauce, mustard sauce, tomato ketchup and soy based sauces. By country, the market is segmented into the U.S. and others under North America; Germany, Italy and France under Europe; India, China and others under Asia Pacific; and Brazil, Saudi Arabia and others under RoW. U.S., Japan, China and Germany dominate the market for condiments sauces and are expected to maintain its dominance over the forecast period. Mexico, Egypt, Turkey, South Africa and Poland among others are the major emerging countries for condiment sauces. Tomato ketchup and soy based sauces are preferred over other sauces in the U.S. Consumers in the U.S. show strong preference for tomato based products and soy sauces owing to its essential usage in multi cuisine food preparation. In Germany, tomato ketchup and mustard sauce is leading the market for condiments sauces. Mustard sauce is preferred over other sauces in France due to its unique taste and color, whereas tomato ketchup is dominating the UK condiments sauces market. Soy based sauces are leading the condiment sauces market in Japan and China across the Asian countries. Homemade food consumption is increasing due to active lifestyle and so the food manufacturers are introducing a variety of soy sauce to help consumers have an exotic dining experience at home. Growing health concerns is one of the main factors the consumers are shifting towards products like superior quality condiments sauces as it contains less salt and sugar. Keeping in mind the ongoing trend, manufacturers are introducing new range of sauces in the market to meet the consumer demand. In Brazil and Saudi Arabia, tomato based sauces are dominating the condiments sauces market. Changing eating habits and taste preferences are boosting the demand for condiments sauces in these countries. Increasing number of fast food chains and growing working population has a positive impact on the food industry. Rising demand for fast food and snacks have increased the consumption of condiments sauces.

Technology Requirements[9]

With packaging increasingly becoming a important feature for consumerism as well as maintaining quality standards, hence in the sauces and condiments category too its importance cannot be ignored. The current technology which needs to be emphasized upon is flexible pouch packaging. The high oxygen barrier film is ideal for packaging products with extended shelf-life requirements such as tomato based sauces. It would provide the food processors higher productivity and greater flexibility. With this packaging system, the fluid products are filled in pouches of various sizes, ranging from 2.5 to 7.5 litres, resolving many capacity problems. A fitment option turns the flexible pouch into part of an easy-to-use, manual dispensing system ideal for condiments. Flexible pouches also have greater shipping and storage efficiencies, virtually 100% product yield; no dangerous, jagged edges, and less solid waste volume.

[9] ***http://cryovac.com/AP/JP/pdf/HEINZ%20INCREASES%20QUALITY%20AND%20SERVICE.pdf***

Tapioca and Maize Starch[10]

India's position in this category is 7th. India controls 34 per cent of the total global trade in starch. In India Tapioca and Maize starch is produces in subsequent quantities. In terms of production technology, India uses the Wet Mill Starch production for Corn/Maize starch which is the technology used by leading manufacturers in USA and China. However, Tapioca starch also commands a substantial demand in the US and European countries. In India, Tapioca starch manufacturers' uses non-mechanized technology which results in non-export compliant. It is in this sector which needs a substantial focus. The production method is called as Modified Starch production technology which can be used for other tuber based starch production. The technology which is needed to be introduced in this segment is as follows:

1. Rasping: Rasping (grating) is the first step in the starch extraction process. The goal is to open all the root cells and release all starch granules. The slurry (rasping) obtained can be considered as a mixture of pulp (cell walls), fruit juice, and starch. On modern high-speed machines, rasping is a one-pass operation only.
2. Use of Sulphite: The cell juice is rich in sugar and protein. When opening the cells, the juice is instantly exposed to air and reacts with the oxygen, forming coloured components adhering to the starch. Food grade sulphur dioxide gas or sodium bisulphite solution has to be added. The reduction potential of the sulphite prevents discoloration. Sufficient sulphite has to be added to turn the juice and pulp light yellow.
3. Extraction: Powerful flushing is needed to release the starch granules from the cells - the cells are torn apart in the rasper and form a filtering mat retaining the starch. The starch is flushed out and leaves the extraction sieves along with the fruit juice. The cell walls (pulp) can be concentrated further on dewatering sieves to a drip-dry pulp with 12 - 15 % dry matter.
4. Refining: The concentrated crude starch milk is washed with fresh process water in order to remove residual fruit juice and impurities. With hydrocyclones it is feasible to reduce fibre and juice to low levels with a minimum of fresh water. To save rinsing water the wash is done counter currently - i.e. the incoming fresh water is used on the very last step and the overflow is reused for dilution on the previous step, and so on.
5. Cleaning in Place: Cleaning in Place is done with caustic and hypochlorite as cleaning agents. Caustic is a powerful agent for removal of the protein build-up on the interior walls and the hypochlorite is an efficient germ killer

[10] ***Journal of Scientific and Industrial Research, Volume 58***

6. Drying and Sifting: The purified starch milk is dewatered on a continuous rotating vacuum filter or a batch operated peeler centrifuge. The moist dewatered starch is dried in a flash dryer with hot air.

CHAPTER 7 COMMON INFRASTRUCTURAL REQUIREMENTS

A key requirement for the export of processed food products would be having an access to support infrastructures such as cold storages, warehouses, specialized transport equipments to ensure a proper management of these products and hence to increase their shelf life. In a report by Department of Commerce, Ministry of Commerce & Industry, Government of India which analyzed the Transaction Costs involved in exports from India, the following key points emerged:

1. Number of Days taken to Export: Considering the fact that processed foods are highly time sensitive, it is imperative that common infrastructures like Inland Container Depots, Container Freight Stations (CFS) are conveniently located for speedier exports of the products.

Locations	Time Taken(Days)
Ahmedabad	15
Mumbai	15
Kolkata	20
Ludhiana	22
Jaipur	23
Chennai	25
New Delhi	25
Hyderabad	25

2. Cost of exporting a container: Along with time, it is also important to analyze the cost of exports for exports. The following table presents the cost of exporting a container from primary port locations in India.

Locations	US $ per container
Ahmedabad	1000
Mumbai	1000
Kolkata	700
Ludhiana	1200
Jaipur	1400
Chennai	450
New Delhi	1200
Hyderabad	1100

It has been observed that on an average the cost of export of a container from India is around US$ 945 which is quite higher than major competing countries. The following major parameters were identified for exports:

1. Document Preparation

2. Customs clearance and technical control
3. Ports and terminal handling
4. Inland transportation and handling

Activities	Cost(US $)	Contribution	Days	Contribution
Document Preparation	350	37%	8	47%
Customs clearance and technical control	120	13%	2	12%
Ports and terminal handling	175	19%	3	18%
Inland transportation and handling	300	32%	4	24%
Total	945		17	

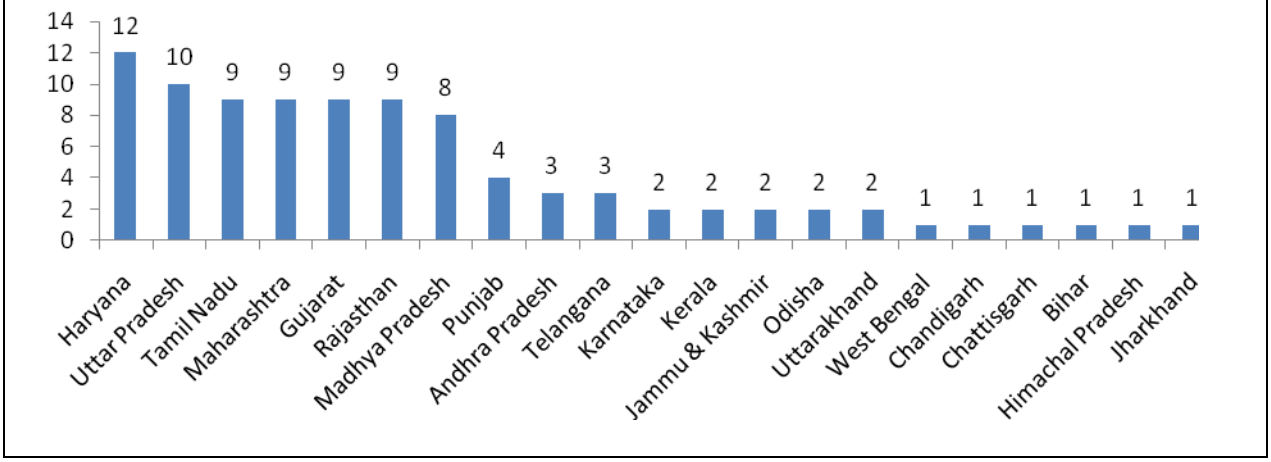
Source: Task Force on Transaction Cost in Exports, Department of Commerce, Ministry of Commerce & Industry, Govt. of India

It can be summarily observed that Inland transportation and handling and Ports and terminal handling constitute for 51 per cent and 42 per cent for Costs expenditure and Number of Days spent for exports respectively.

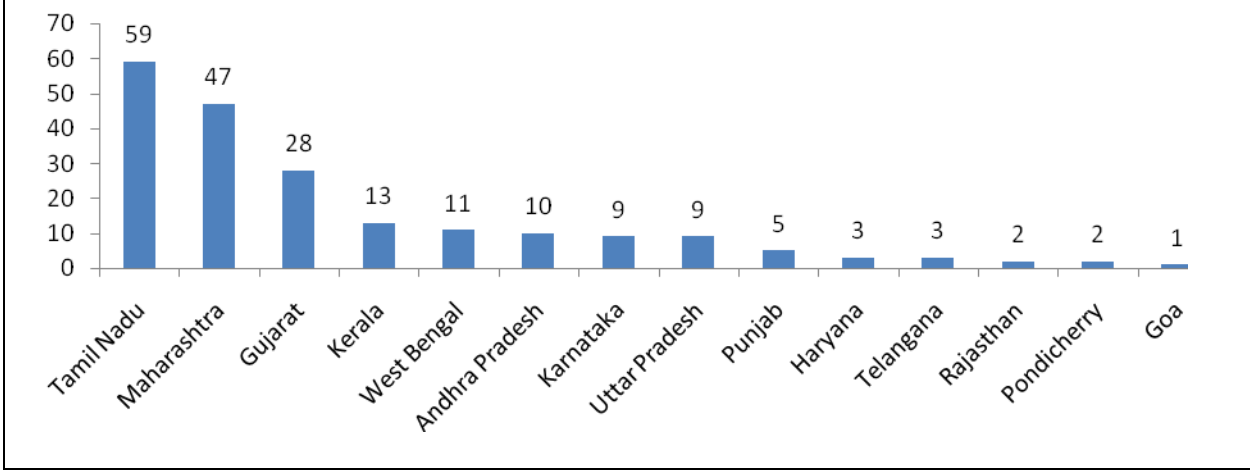
Inland Transportation and Handling: Inland transportation and handling involves the following supply chain components in the system:

- Inland Container Depots/Container Freight Stations: At present there are 92 inland container depots in India spread across 21 states. In terms of Container Freight Stations (CFC), there are 202 CFCs spread across 14 states in India.

State Wise ICDs in India



State Wise CFCs in India



- Reefer vehicles for perishable goods: In a National Conclave on Refrigerated Vehicle held by National Center for Cold Chain Development (NCCD) in 2013, it was estimated that there are around 7000 refeer vehicles in India with a total annual capacity of 20 million to 30 million metric tonnes. This may be enhanced for improving the supply chain and maintaining quality standards especially for products derived for fruits and vegetables.
- Perishable cargo centers: In terms of perishable cargo centers, India currently possesses perishable cargo centers at four airports namely Delhi, Mumbai, Chennai and Bangalore. In addition to these, the Ministry of Railways, Govt. of India has recently developed a perishable cargo center in New Delhi. Such infrastructures also may be enhanced.

Port and Terminal Handling: There are 14 major ports in India along with around 200 small and minor ports. The cargo wise traffic handling volume for 2014-15 has been provided in the below table:

	Other Cargo	Coal	Fertilizer	Iron Ore	P.O.L	Container Cargo
EASTERN ZONE						
Kolkata Dock System	40%	1%	1%	1%	4%	53%
Haldia Dock Complex	13%	19%	2%	20%	43%	5%
Paradip	12%	54%	6%	3%	25%	0%
SOUTHERN ZONE						
Visakhapatnam	33%	15%	4%	14%	25%	8%
Kamarajar (Ennore)	9%	81%	0%	0%	11%	0%
Chennai	17%	0%	1%	0%	24%	57%
Tuticorin	35%	22%	7%	0%	3%	33%
V.O. Chidambaranar	33%	27%	5%	0%	2%	34%
Cochin	8%	0%	2%	0%	65%	24%
New Mangalore	6%	22%	2%	4%	63%	3%

WESTERN ZONE						
Mormugao	29%	58%	2%	5%	4%	2%
Mumbai	32%	8%	1%	0%	59%	1%
J.N.P.T.	4%	0%	0%	0%	7%	89%
Kandla	23%	11%	5%	1%	60%	0%

Source: http://ipa.nic.in/

Since the identified products are processed products which would require containerized way of exports it would be important to analyze the container cargo traffic handled at each of these ports. Lower level of container cargo traffic could imply lack of adequate infrastructural facilities in these ports which could be improved.

From the above analysis, the above ports can be targeted for this:

1. Haldia
2. Paradip
3. Ennore
4. Vishakhapatnam
5. New Mangalore
6. Mormugao and
7. Kandla

Mumbai Port is mostly used for Bulk Cargo nowadays.

The raw materials for the focused products are primarily of the following types:

1. Wheat
2. Onions
3. Garlic
4. Horticulture(Fruits, Vegetables, Spices)
5. Maize
6. Pulses(blackgram)

Upon undertaking a mapping of the primary source of availability of the raw materials, the following states emerge as the leading producers in India:

Wheat	Uttar Pradesh, Haryana, Madhya Pradesh, Punjab
Onions	Maharashtra, Karnataka, Gujarat, Bihar, Madhya Pradesh, Andhra Pradesh, Rajasthan, Haryana
Garlic	Madhya Pradesh , Gujarat, Rajasthan, Odisha, Uttar Pradesh, Maharashtra, Punjab & Haryana
Horticulture(Fruits, Vegetables, Spices)	West Bengal, Uttar Pradesh, Maharashtra Tamil Nadu, Gujarat, Madhya Pradesh, Karnataka, Bihar, Andhra Pradesh, Odisha, Kerala, Telangana, Chhattisgarh, Haryana, Assam, Punjab, Jharkhand, Jammu & Kashmir

Maize	Uttar Pradesh, Madhya Pradesh, Rajasthan, Andhra Pradesh, Bihar, Tamil Nadu, Karnataka, Maharashtra
Pulses(Blackgram)	Maharashtra, Uttar Pradesh, Andhra Pradesh, Orissa, Tamilnadu, Rajasthan, Chhattisgarh and Madhya Pradesh

The above mentioned states comprises of around 95 per cent of the total production in the country for the aforementioned raw materials.

		ICDs	CFS	Target Ports
NORTHERN INDIA				
Uttar Pradesh	Wheat, Garlic, Horticulture, Maize	32	11	NA
Haryana	Wheat, Onions, Garlic, Horticulture			
Punjab	Wheat, Garlic, Horticulture, Blackgram			
CENTRAL INDIA				
Madhya Pradesh	Wheat, Onions, Garlic, Horticulture, Maize	9	NA	NA
Chhattisgarh	Horticulture			
SOUTHERN INDIA				
Karnataka	Onions, Horticulture, Maize	19	96	Ennore, Vishakhapatnam, New Mangalore
Andhra Pradesh	Onions, Horticulture, Maize			
Kerala	Horticulture(spices)			
Tamil Nadu	Horticulture, Maize			
WESTERN INDIA				
Gujarat	Onions, Garlic, Horticulture	27	76	Mormugao, Kandla and Mumbai
Maharashtra	Onions, Garlic, Horticulture, Maize			
Rajasthan	Onions, Garlic, Maize			
EASTERN/NORTH EASTERN INDIA				
Bihar	Onions, Horticulture, Maize	5	11	Haldia, Paradip
Odisha	Garlic, Horticulture			
Assam	Horticulture			
West Bengal	Horticulture			

Therefore the focus zone for Inland Container Depots can be the following:

- Eastern Zone: Bihar, Odisha, Assam and West Bengal
- Central India: Madhya Pradesh and Chattisgarh

Similarly, the focus zones for Container Freight Stations can be the following:

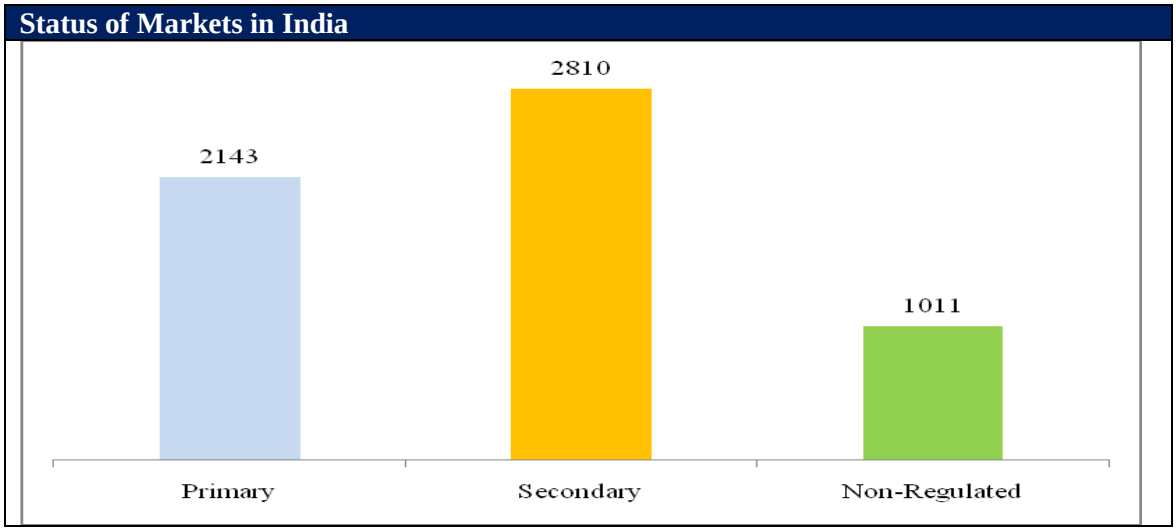
- Central India: Madhya Pradesh and Chattisgarh
- Northern India: Uttar Pradesh, Haryana and Punjab

- Eastern India: Bihar, Odisha, Assam and West Bengal

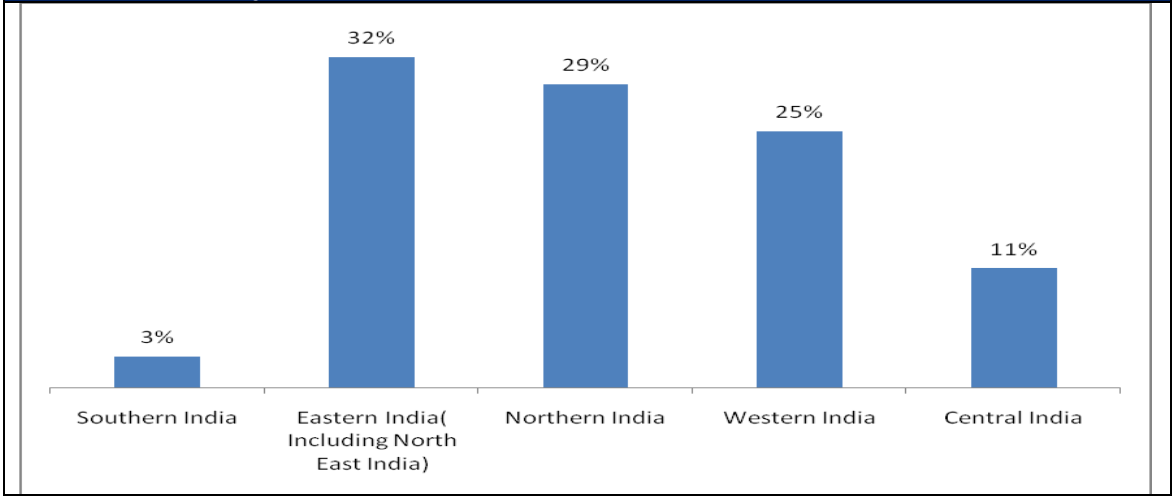
ADDITIONAL CORE COMMON INFRASTRUCTURE

In addition to the basic infrastructure requirement as discussed above, supporting infrastructure would also needed to be adequately positioned and enhanced to support the food processing units. This is an important component in maintaining the quality standard of the product. They can be as follows:

1. Primary, Secondary & Non-Regulated Markets: Establishment of primary and secondary & non-regulated markets in the identified clusters can lead to proper supply of raw materials to the processors. As per the Directory of Wholesale Agricultural Produce Assembling Markets in India, there are around 2143 Primary markets, 2810 Secondary Markets and 1011 Non-regulated markets. An analysis of the exiting market places available in India is provided in the below figure:



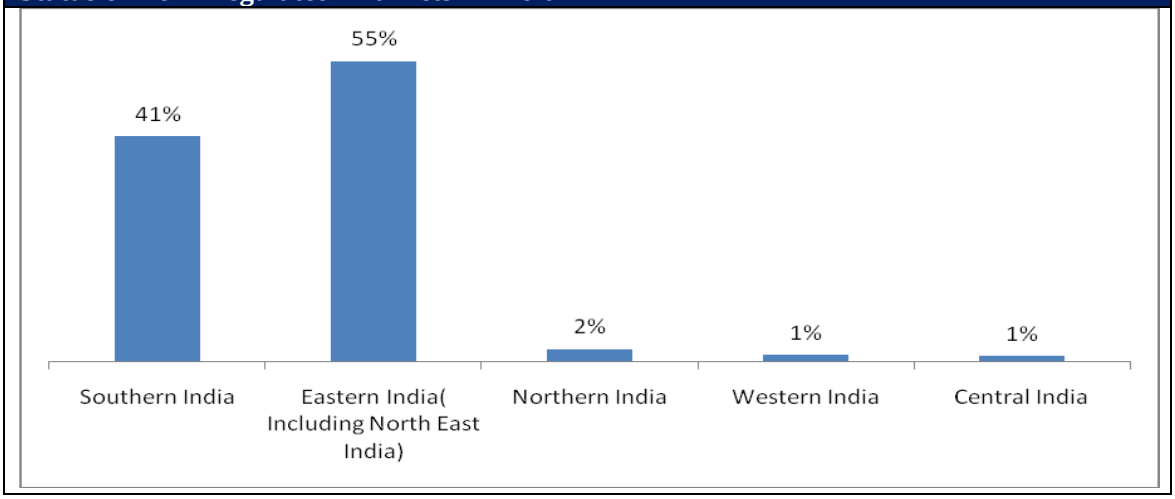
Status of Secondary Markets in India



Focus may be thus directed towards creation of Secondary Markets in the Southern and Central Indian region. They are as follows:

1. **Southern India**
    a. Karnataka
    b. Andhra Pradesh
    c. Kerala
    d. Tamil Nadu
2. **Central India**
    a. Madhya Pradesh
    b. Chhattisgarh

Status of Non- Regulated Markets in India



Focus may be thus directed towards creation of Non-regulated Markets in the Northern, Western and Central Indian region. They are as follows:

1. **Northern India**
    a. Uttar Pradesh

b. Haryana
c. Punjab

2. **Western India**
   a. Gujarat
   b. Maharashtra
   c. Rajasthan
3. **Central India**
   c. Madhya Pradesh
   d. Chhattisgarh

2. Cold Storages: Cold Storage are also an important component in helping maintain the quality of fruits and vegetables as well as for processed foods such as Wine of Fresh Grapes, Jam, jellies & Marmalades, Fruit Juices and Concentrates etc. It is estimated that there is around 30.1 million metric tonnes of cold storage space available in India. Currently India has around 6889 cold storage across India. The following figure provides a landscape view of cold storage in different states in India.

Zonal Distribution of Cold Storage in India

Source: farmer.gov.in

3. Dry Warehouses: In terms of Dry Warehouse, there are around 433 in India. Dry warehouses are also an important component in maintaining and preventing spoilage of grains, pulses particularly wheat, blackgram etc. They are also useful in storage of processed foods which require ambient condition for storage albeit in hygienic condition. It is estimated that there are 120 million metric tonnes of dry warehousing capacity available in India. The following figure provides a landscape view of dry warehouses in different states in India.

Zonal Distribution of Dry warehouses in India

Source: Annual Report, Warehousing Development and Regulatory Authority

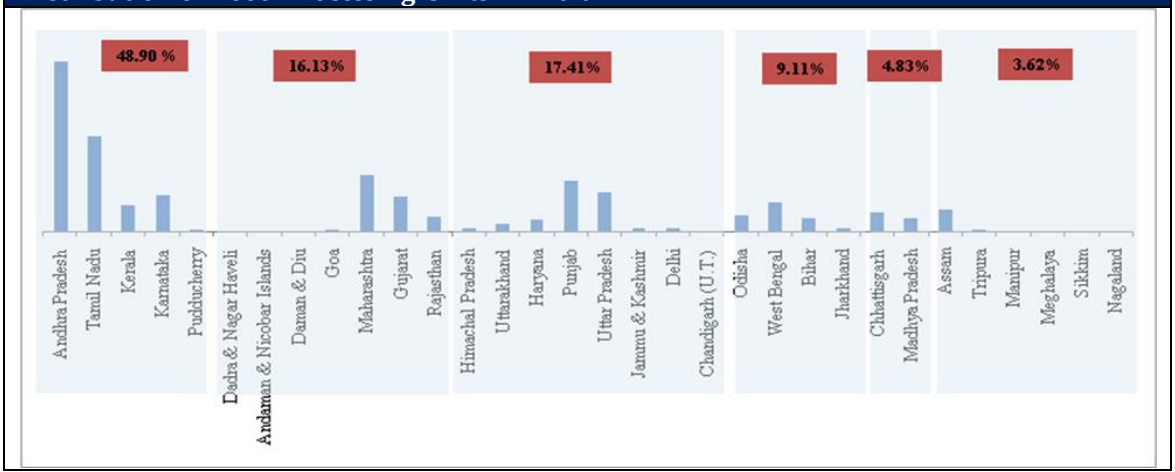
4. Apart from the above mentioned support infrastructure, a key component of export enabling support infrastructure is also the Quality testing labs. Exports of processed food requires adherence to strict quality controls by the processors which needs to verified and certified by FSAAI notified laboratories. Currently, there are around 62 FSSAI notified laboratories in India. The following figure provides a landscape view of the presence of the testing labs in different locations in India.

FSSAI Notified NABL Accredited Food Testing Laboratories in India

5. Common Processing facilities: The Ministry of Food Processing Industries, Govt. of India has provided a significant thrust in improving the food processing environment in India. The flagship schemes being implemented by the Ministry is Scheme for Mega Food Parks in which around 39 Mega Food Parks are in various stages of implementation throughout the country. Apart from this, another Centrally Sponsored Scheme like National Mission on Food Processing was also being promoted by the Ministry which has been recently de-linked. The following figures a

landscape view of the presence of food processing units in the country. It can be seen that the major concentration of units is in Southern India at around 48.90 per cent. It is followed by Northern India which is at 17.41 per cent, Western India at 16.13 per cent and Eastern (including North Eastern India) at around 13 per cent. The processing capability in Central India is very low at 4.83%. In this view it may advisable to focus on promotion of food processing units in the Central region primarily with limited focus in the Northern, Western and Eastern region.

Distribution of Food Processing Units in India



Source: Annual Survey of Industries

It is clear from the above that the focus on food processing units may be directed towards the following states:

Name of States	Units focusing on
Odisha	Garlic, Horticulture(Mango, Guava, Citrus, Sapota, Papaya)
West Bengal	Horticulture(Mango, Pineapple, Banana, Papaya, Tomato, Cabbage, Cauliflower, Peas, Brinjal)
Bihar	Onions, Horticulture(Mango, Litchi, Guava, Beans, Okra), Maize
Jharkhand	Litchi, Aonla, Mango, Strawberry, Custard apple, Jackfruit, Guava, Tamarind, Pea, French bean, Tomato, Cauliflower, Cucumber, Okra, Cucurbits Pointed gourd, Beans, Chilli, Early potato, Coriander leaves
Chhattisgarh	Mango, Guava, Lime, Litchi
Madhya Pradesh	Wheat, Onions, Garlic, Horticulture (Orange, Banana, Papaya, Guava), Maize
Assam*(Including North East)	Horticulture(Pine apple, Banana ,Assam lemon, Tomato, Cabbage, Cauliflower)

The following table presents the consolidated analysis for the supporting common infrastructures.

NORTHERN INDIA		Food Processing Units	Secondary Market	Non-Regulated market	Cold Storage	Dry Warehouses	Quality Testing laboratorial
Uttar Pradesh	Wheat, Garlic, Horticulture, Maize	17.41%	29%	2%	47.41%	16.63%	29%
Haryana	Wheat, Onions, Garlic, Horticulture						
Punjab	Wheat, Garlic, Horticulture, Blackgram						
CENTRAL INDIA							
Madhya Pradesh	Wheat, Onions, Garlic, Horticulture, Maize	4.83%	11%	1%	5.07%	11.78%	5%
Chhattisgarh	Horticulture						
SOUTHERN INDIA							
Karnataka	Onions, Horticulture, Maize	48.90%	3%	41%	13.88%	33.26%	27%
Andhra Pradesh	Onions, Horticulture, Maize						
Kerala	Horticulture(spices)						
Tamil Nadu	Horticulture, Maize						
WESTERN INDIA							
Gujarat	Onions, Garlic, Horticulture	16.13%	25%	1%	18.62%	36.49%	31%
Maharashtra	Onions, Garlic, Horticulture, Maize						
Rajasthan	Onions, Garlic, Maize						
EASTERN/NORTH EASTERN INDIA							
Bihar	Onions, Horticulture, Maize	13%	32%	55%	~15%	1.85%	8%
Odisha	Garlic, Horticulture						
Assam	Horticulture						
West Bengal	Horticulture						

From the above analysis, we can observe the following:

1. Secondary & Non-Regulated Markets: The following states may be considered for enhancing the presence of Secondary Markets: i) Karnataka ii) Andhra Pradesh iii) Kerala iv) Tamil Nadu v) Madhya Pradesh vi) Chhattisgarh.

   In addition to the above, the following markets may be considered for Non-regulated markets:

   i) Madhya Pradesh ii) Chattisgarh iii) Karnataka iv) Andhra Pradesh v) Kerala vi) Tamil Nadu vii) Bihar viii) Odisha ix) Assam and x) West Bengal
2. Cold Storage: Incase of cold storage, around 48 per cent of the cold storages are located in Northern India. A significant amount of thrust is required in central India which houses on 5 per cent.
3. Dry Warehouses: Central and Northern India being major grains, pulses and maize producing areas need significant focus for development of dry warehouses. Although the Eastern and Northeastern region lacks dry warehousing capacity, it may be analysed that this region is primary known for horticulture based crops except for the states of Bihar and Odisha. Hence, focus should be directed in the states of Bihar and Odisha for development of dry warehouses.

   Quality testing labs: presence of quality testing laboratories is necessary for food processors to have a quick access for certification and certification purposes. However the central and Eastern/North Eastern region lacks such facilities which can prove to impediments for facilitating exports. Therefore the following may be focused on for developing such facilities: Madhya Pradesh, Chattisgarh, Bihar, Odisha, Assam, and West Bengal.

CHAPTER 8 SUCCESSFUL MODELS SUPPLY CHAIN

This chapter will focus on understanding successful supply chain models in competing countries. For this, the study has identified the following case studies:

They are explained below.

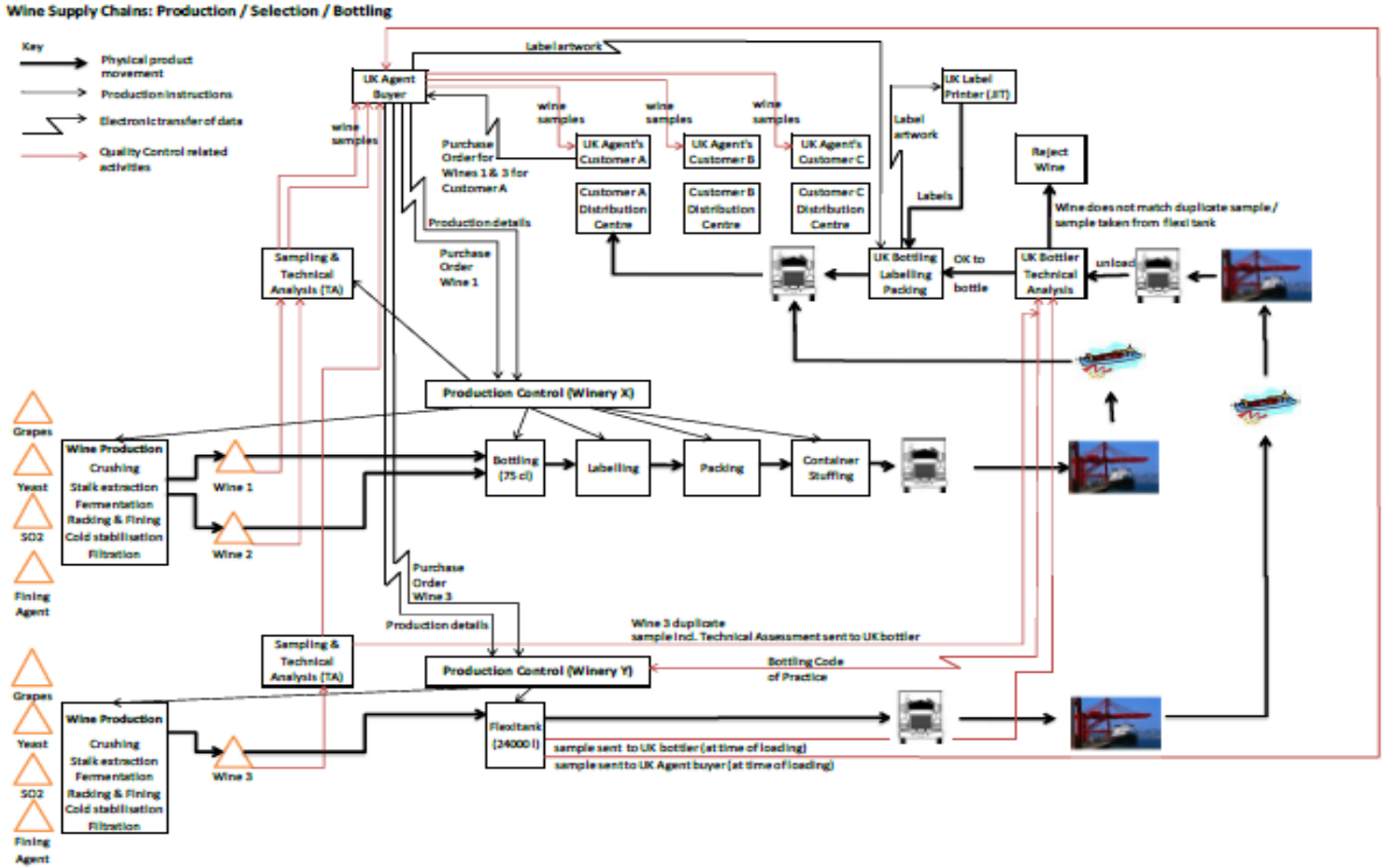
1. A Case Study of Wine Supply Chain between Chile and the UK

Chilean Wine Supply Chains: Production / Selection / Bottling

There are three main types of stakeholders in the wine supply chains. The first is the wine producers, labelled Winery X and Winery Y; the second is the UK Agent Buyer, which in this case represents Thierry's Wine Services; and the third type of key stakeholder is Thierry's customers, labelled UK Agent's Customer A, B and C. These are Thierry's main customers and include the main supermarkets in the UK. The process begins with production of wine by winery X and winery Y in Chile. Winery X produces wine 1 and wine 2 from their raw materials being grapes, yeast, sulphur dioxide and a fining agent. Winery Y produces wine 3 from similar ingredients. Once the wines have been made and stabilised, the UK Agent Buyer will ask both wineries to arrange for a technical analysis to be made of their wines. This typically includes the alcohol level, colour, haze, pH, obscuration, sugar (grams per litre) and methanol (in ppm). This technical analysis is sent to the UK Agent Buyer together with samples of the wines for tasting, by courier. Wine samples sent from Chile take seven days to arrive in the UK as they go via Germany with the international courier company DHL. The UK Agent Buyer will arrange from time to time to show new wines to their customers either at major wine events, such as the London Wine Trade Fair, or on an individual basis. The customers' wine buyers have the opportunity to taste the wines at the events and if they are interested, will then request that further samples be sent to their offices for further tasting. In our example, samples of all three wines have been sent to three of the UK Agent Buyer's customers and Customer A has issued a purchase order to the UK Agent Buyer for wines 1 and 3 following the negotiation of the price and volume (which is not dealt with here). The UK Agent Buyer then issues purchase orders to winery X and winery Y together with the production details, which include the volume and shipment dates. In the case of winery X, the production details include the artwork for the label design and specifically the contents of the back label, much of which is a requirement under UK law. The supply chain for winery X is relatively straight forward as the wine is bottled, labelled, packed and palletised in the winery prior to be being loaded into a 40 foot container and being

despatched by truck to the container terminal at the port of Valparaiso. However, the supply chain for winery Y is more complex as the winery does not have a bottling plant. Instead, the wine is loaded into a 20 foot container which contains a 24,000 litre single-use flexitank with the purpose of shipping it to the UK bottler. Prior to loading, winery Y will have agreed with the UK bottler a series of quality measures under the terms of the UK bottler's code of practice. These measures are designed to ensure that the wine which arrives at the UK bottler is in the same state and of the same quality as originally intended by the winemaker and reflect the sample originally sent by the winery to the UK Agent Buyer and its customers. At the time of loading the flexitank, a further sample of the wine is taken and one sample is sent by courier to the UK bottler and another to the UK Agent Buyer. Once wine 3 arrives at the UK bottler's in its flexitank, the UK bottler will taste the wine against the sample sent when the flexitank was loaded and conduct a further technical analysis, all before the flexitank is discharged into the care of the UK bottler. This is to ensure that the wine received is that intended for receipt and that its quality has not been affected in any way since it left the winery. In the rare event that the wine does not match the duplicate sample sent by the winery, it will be rejected. However, once the quality control procedures have been complied with, the wine from the flexitank will be discharged in to the UK bottler's tanks and will be bottled in just four hours. Thereafter, the bottles are labelled, according to the artwork sent by the UK Agent Buyer and printed by the bottler's local printer on a JIT basis. The labelled bottles are then boxed, palleted and shipped to customer A's distribution centre.

A Schematic representation of the Chilean Wine Supply Chain Model

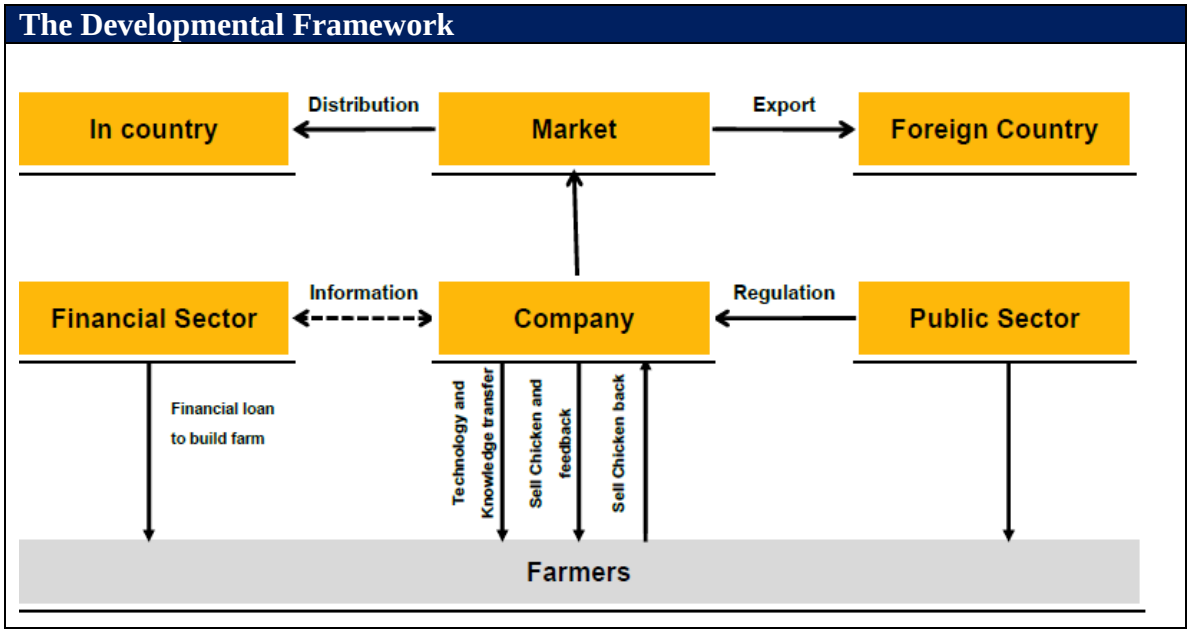


2. Supply Chain Management: Enhancing World Food Security and trade facility. Case study of Thai Poultry Industry[11]

Thailand started exporting chickens to world market in 1973. However gradually by 2004, exports of cooked poultry meat increased gradually in place of live poultry meat. Japan was the lead importing country from Thailand. This led to the Thai poultry incorporating the following changes:

a. Because of the different culture of consumption, Japan importers needed to teach Thai producers to match Japanese style.
b. And because the huge trade volume has increased year by year, has lead to enlargement of capacity building.
c. Thai producers have had to import high technology machines to improve their production

The Thai poultry industry incorporated Contract Farming Model to ensure a stable supply chain.



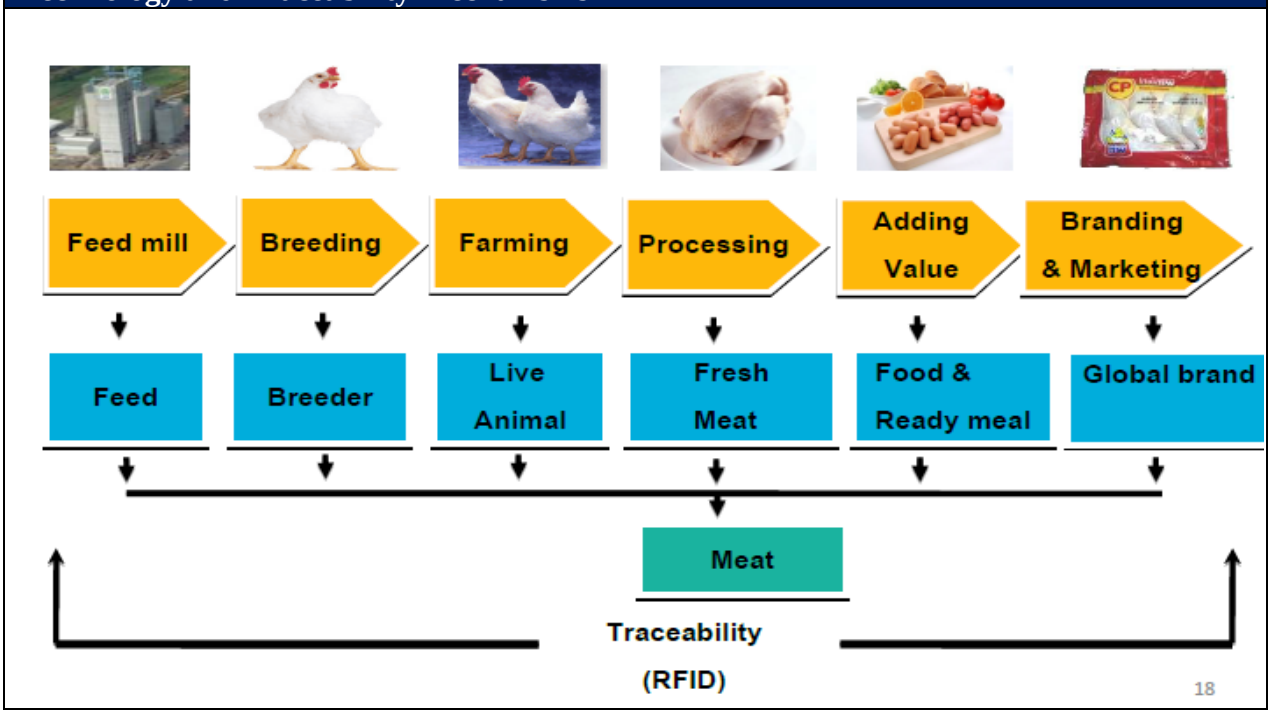
Finally the Thai poultry industry evolved the PPPP-4Ps model which is known as the Small Private – Large Private – Public – Partnership model.

[11] **Supply Chain Management: Enhancing World Food Security and trade facility. Case study of Thai Poultry Industry, CP Food and FAPP**

Before	After
	

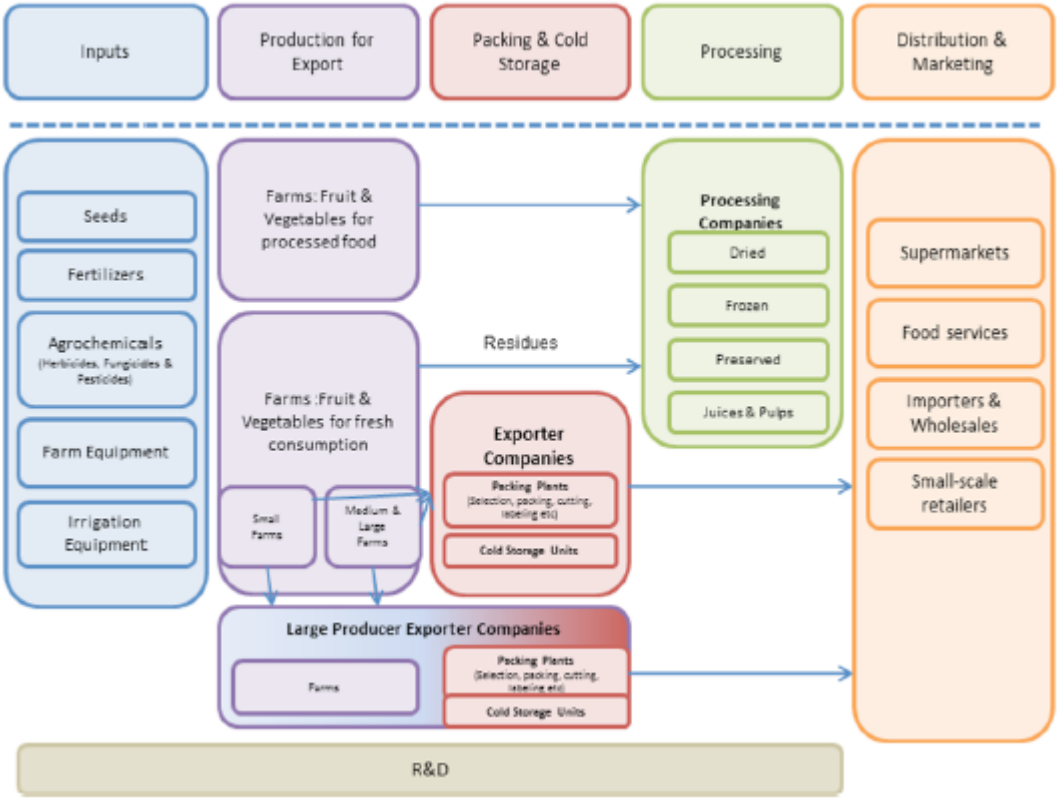
Around 1993, Thailand faced strict competition from China. This led the Thai poultry industry to incorporate technology into the system. As a result, Thailand became the largest cooked chicken meat exporter globally by 2011. Along with Thailand also introduced Traceability and RFID mechanisms which enabled further trade facilitation.

Technology and Traceability Mechanisms



The Fruit & Vegetable Supply chain

The processed vegetables supply chain is presented in Figure 1. This supply chain includes several segments: inputs, production, packing and storage, processing and distribution and marketing. The most important inputs for production in this industry are seeds, fertilizers, agrochemicals (herbicides, fungicides and pesticides), farm equipment, and irrigation equipment. Logistics and transportation fulfill key supporting functions, while government regulatory bodies are required to approve the sanitary and phytosanitary conditions of outbound products. Due to the fragile and perishable nature of the product, a high degree of coordination between the different actors along the chain is required. This ensures that the perishable product reaches its destination in good condition. Cold storage units are used throughout the chain to keep the produce fresh, and both air and sea freighting supported by the cold chain are key elements to ensure timely delivery.



Following this, the key segment of the supply chain for developing countries, production for export, is divided between production for fresh consumption and production for processed fruit and vegetables. In some cases, the fresh fruit and vegetables that are not accepted for sale as fresh produce are used as inputs for the processing stage, but in other cases, such as orange juice or preserved peaches, a specific variety and grade quality is required and production occurs separately. Production is organized in small, medium, and large farms that supply exporter companies and/or producer-exporter companies that own farms, but they may also supplement their supply by buying from other farms. Industry associations often play important supporting roles at this stage in disseminating information about new products, processes and best practices. The next segment is packing and cold storage.

Processed fruit and vegetables include dried, frozen, and preserved produce, as well as juices and pulps. Processing plants purchase fruits and vegetable inputs from the producers. These firms may export their products under their own brand, as well as under the buyer's brand. The last stage of the supply chain before consumption is distribution and marketing. In this final stage, the produce is distributed to different channels including supermarkets, small-scale retailers, wholesalers, and food services.

Supply Chain Analysis – Fruit juices & concentrate

United States Of America

International trade in the fresh fruits sector is characterized by the reduced degree of concentration of supply, with a multitude of medium-sized firms providing the fruit, although there is a certain trend towards concentration of producer groups as a response to buyers consolidation.

There is also an important presence of cooperatives in this sector, which favor the obtention of better prices and conditions, improve negotiating power and coordination of activities of growers. Some examples of cooperatives in the citrus fruits sector are Sunkist in the United States and Anecoop in Spain, which is a union of cooperatives.

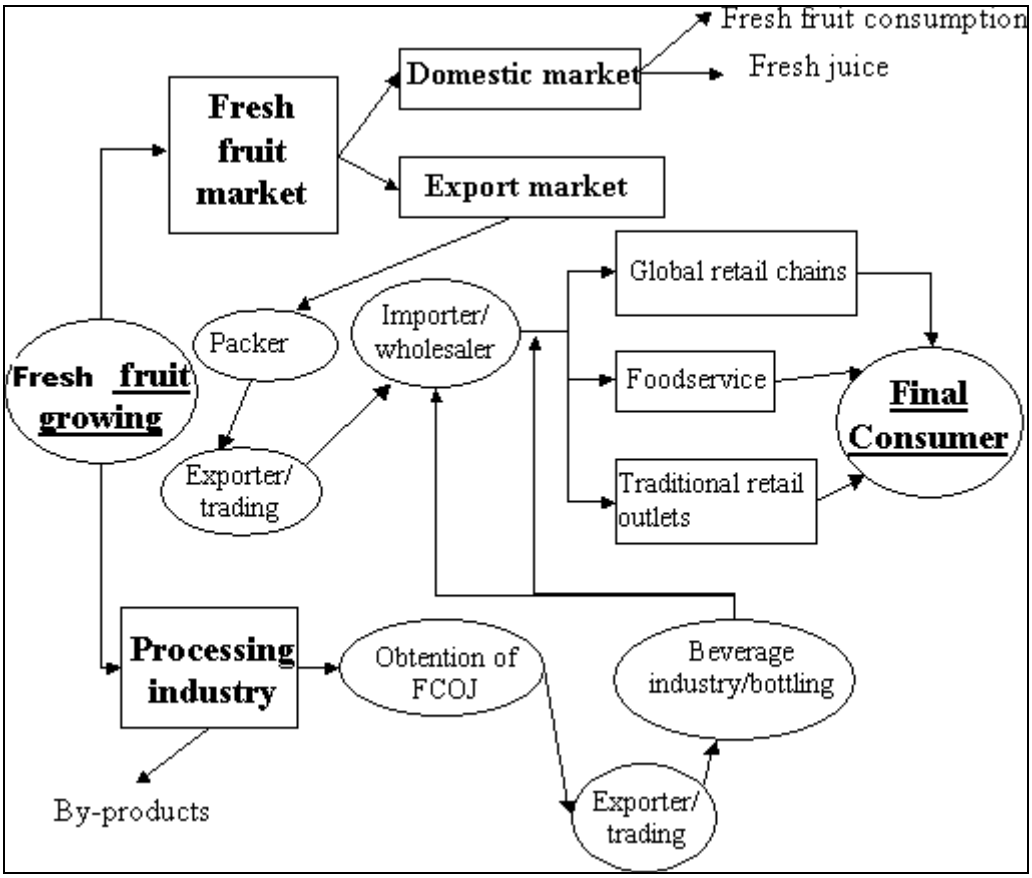
As a part of supply chain, fruit sold for the fresh market is hauled to packinghouses where it is graded and packed, then shipped to terminal points for distribution to retailers such as grocery stores. Culled fruit not meeting grade for the fresh market is sold to processors. Produce for the processed market is transported to processing plants for juice extraction. Bulk juice is moved to concentrate plants for evaporation and freezing into frozen concentrate or to canning plants for retail packaging. Bulk frozen concentrate juice is sold to plants outside State for reconstituting and packaging.

State processors also import orange juice concentrate from Brazil, Mexico, Caribbean basin countries, and other citrus producing states in the United States. Retail packaged citrus juice products may be exported to distributors outside the state or sold to wholesalers and then to retailers for sale to consumers under a nationally advertised brand or private grocery chain label. As products change form and move through market channels, value is added from labor, capital and management.

The industry is linked to input supply businesses that provide fertilizers, chemicals, grove care services, packaging materials, transportation, etc, and labor for citrus production and processing is provided by state residents.

The export market is more important for fresh fruits from USA than for juice, particularly in the case of grapefruit.

A simplified representation of the fruit Juice Supply chain, identifying the major agents in the chain (although, given the vertical integration existing in the orange juice sector, a company may be present at different stages), is shown in the following chart:



There are two kinds of orange juice processors:

- Bulk processors, who produce most of the world´s orange juice, and
- Marketing processors, who sell the packaged juice under their own brand name and often purchase additional juice from bulk processors. The beverage industry buys the FCOJ in order to add water and transform, bottle and market it.

These bottlers have to undergo a process of mergers and acquisitions, where juice companies are becoming part of major multinational beverage companies. This is leading to increasing concentration in the sector. In the United States of America the market share of the three biggest multinational companies was nearly 47%.

The most significant distribution channel for orange juice, as well as for fruit juices and produce in general, are the global retail chains (supermarkets and hypermarkets), that account for more than 80% of total orange juice sold in Western Europe.

Global retail chains are playing an increasing role in the distribution of produce in developed countries, mainly in the EU and USA. This tendency is also developing in Latin America and Asia. Increasing concentration and consolidation in retail chains, as well as their global expansion, has improved their position and augmented their buying power in the market

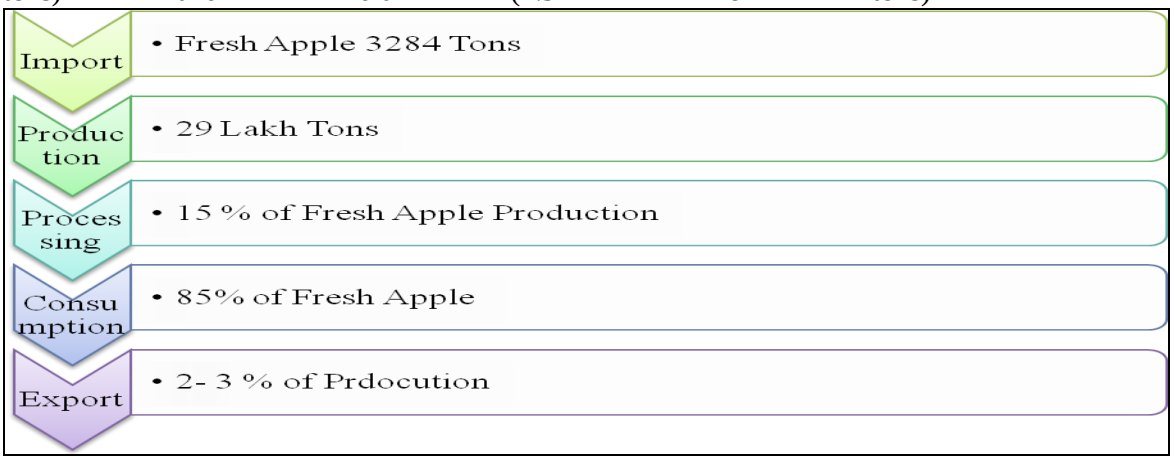
It allows them to influence the marketing chain in order to better control it, imposing more stringent requirements when determining conditions of production and distribution. Supermarkets demand higher quantities, better qualities and lower prices. This downstream shift of power in the produce marketing chain is leading to increased vertical coordination, mainly through supply chain management practices used by the retail chains, such as category management. Supermarkets tend to build long-term relationships with preferred suppliers in order to guarantee continuous supply at the required levels of quality.

European Countries

A large part of the preserved fruit and vegetables used in the EU food industry is imported, often as ingredients. These products are then repacked or processed for export. The trade of preserved fruit and vegetables is pan-European and the trade channels in the different EU countries do not differ greatly. Preserved fruit and vegetables can reach their final destination by passing through different trade channels. The selection of the trade channel and the trade partner depends on the requirements of the final customer, usually the food processing industry. By selecting one specific channel and trade partner, other trade partners are often automatically included.

Turkey

Apples have traditionally been the most economically significant deciduous fruit crop for Turkey. Turkey is the fourth largest producer of apples in the world after China (36 million tons), United States (4 million tons) and India (2.9 million tons) in 2011.



Import, production, processing and export of apples in turkey (2012)

While assessing the supply chain it has been found that in Turkey fresh deciduous apples are traditionally sold domestically, but recently there is a trend of increasing export through private traders and specialized marketing firms.

The recent growth of the export market is caused by a government regulation in 2003 allowing entrepreneurs to establish wholesale fresh vegetable and fruit trading places, in the past parties were not allowed to sell their produce before it was recorded in the local municipal market place

.

In each growing region in Turkey there are a number of cooperatives but none of them is remarkably large and their budgets are usually limited; they help small-scale growers market their products

domestically and do not have any overseas marketing activities. However, some of the juice companies started producing their own fruits, although this is just at the beginning period.

In the deciduous fruit chain a few large commercial orchards were established in recent years which use better quality seedlings and newer technology.

New varieties that are in high demand in importing countries are grown in these orchards. Most of the production is exported and there is an increasing trend of establishing new orchards specifically for exported-oriented production as it is more profitable.

There have been many initiatives taken by the private players itself to promote the production; for instance GlobalGAP is the worldwide standard for good agricultural practices, sets voluntary standards for safe and sustainable agricultural production worldwide and more and more producers, suppliers and buyers are harmonizing their standards to match GlobalGAP. The organization began in 1997 as EUREPGAP, an initiative by European retailers in reaction to consumers' growing concerns regarding product sustainability and safety.

GlobalGAP has a standard on fruits and vegetables covering soil, management, substrates, pre-harvest controls for plant protection product application, organic fertilizer application, pre-harvest check, harvesting, final produce packaging at points of harvest, produce handling covering hygiene, sanitary facilities, packaging and storage areas, quality control, pest control, post-harvesting washing, and postharvest treatment

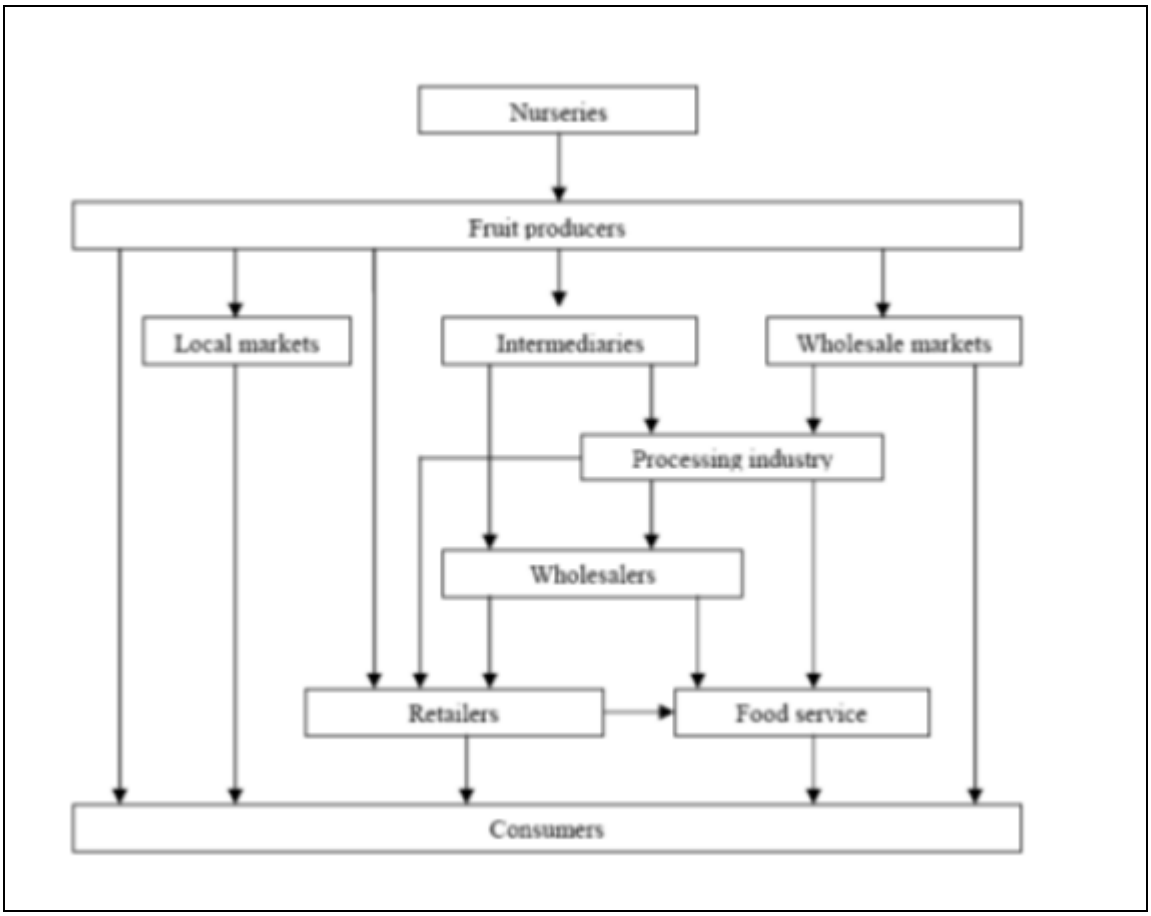
For successful commercial marketing, this would be an important area of attention which has been found lacking in Turkey. The fundamental cause of marketing problems is that in general producers are not organized. Issues like selecting and buying certain varieties, acquiring and applying new growing techniques in the orchards, buying and applying inputs, quality control, packaging and labelling should be organized by farmer groups to reduce cost and capture a bigger share of apple market value. This could be done by founding a federation, cooperative or union.

Poland

Poland is the biggest apple producer in Europe. During the last 10 years the production of these international apple varieties has increased due to their export potential. About a third of Polish apple production is exported in its fresh state, about half is processed and around 20% is consumed fresh domestically.

While studying it has been found that apples that are selected for processing are often of inferior quality; it is the rest product of fresh apple production. Farmers, thus, receive a lower price for it. Prices for apples to be processed are in fact declining, whereas the sales prices charged by the processing industry are actually increasing.

Analysis says that Polish apple production is largely small-scale (two thirds of the farmers have less than five hectare). Small farmers supply local consumers or local markets directly, but the majority of their produce is sold to intermediaries. Larger farmers generally have direct links with wholesalers. Intermediaries and wholesalers supply to the processing industry. The flow of fresh production that goes through intermediaries eventually all ends up with wholesalers. These wholesalers supply domestic and international retailers and food service points.



One of the main strengths of the Polish apple sector is the low cost of labour compared to its European counterparts. An important element in this is the extensive use of large numbers of mainly Belarusian and Ukrainian migrants that work in the Polish apple sector for low wages.

However, a systematic lack of co-operation amongst smallholder farmers in general appears to be a major problem which leads to a fragmented and incoherent market. This is also a problem in the food/ juice production sector where lack of contractual agreements and (minimum) pricing agreements lead to problems of supply and quality. In this case many food producers seek to push costs down the chain or onto the farmers which leads to further supply chain problems in relation to competitiveness and quality. The lack of a strong and effective trade organization for Polish fruit farming is also a limiting factor for the industry especially in relation to international exports.

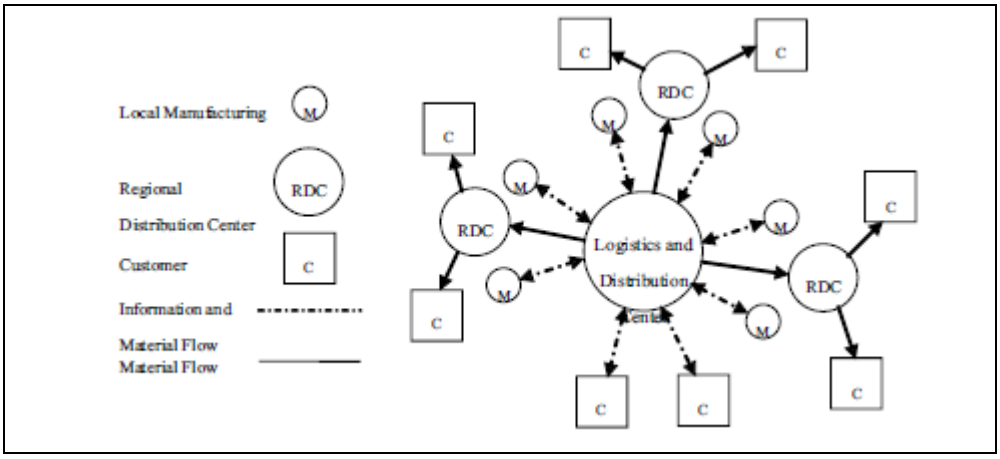
Confectionary Industry

United States of America

Around the world, the Confectionary Industry is still rapidly developing, although if we look at specific examples such as the US, we see the market is fairly well matured. In many cases, the Confectionary Industry started like many others, with a large number of small manufacturers and distributors, all selling their own candies. Large scale consolidation occurred during 1960-1990, which marked the growth of mega-corporations in the food industry segment. This expansionary period created large distribution networks around the world, as well as the early development of growing supply chains. In 2006, the global market for confectionery products was roughly $136 billion, having grown 5.1% from the year

prior. Chocolate products make up about 54.2% of the market and sold over $74 billion in 2006. In this year, the U.S. Confectionery Industry was $27.9 billion, according to Packaged Facts. The market share for most confectionary product segments has remained relatively constant over the last 10 years. Today, chocolate and other confectionary products are sold in a vast array of distribution channels. From vendors on the street to convenience stores, museums to vending machines, and large retailers as well, confectionary products are one thing that can be found almost anywhere. In 2006, roughly $16 million in sales were attributed to retail outlets. In the US, Food, Drug and Mass retail (FDM) accounts for only 29.2% of retail sales. Nearly 43% of chocolate sales occur in the non-traditional channel such as smaller chocolate stores and through independent distribution. The supply chain for confectionary products spans the globe and consists of literally thousands of contributors. Chocolate products for example start with sugar, cocoa and milk production from farms located around the world. These raw materials are then sent through distribution agents to large scale manufacturing facilities, which refine the material and send it on to product manufacturing. High profile brand management companies then combine these materials to make their delicious snacks and commonly hold product in warehouses to satisfy demand for the multitude of retailers that exist. This material movement takes a strong level of coordination to ensure customers have chocolate when they want it. As margins are low, volume sales are key.

In the Confectionary Industry, there are only a small number of large companies that have emerged to become market leaders.



The first step to reorganizing material movements was to closely analyze the customer demand and expectations in areas such as delivery time, quantity, and how the product should be delivered, for example in-transit stacking. This process also included a more fully developed integration into customer customized software. Since material flow costs can be looked at in terms of handling costs, a system for direct movement between the manufacturing facility and the customer was created. The cost savings from eliminating the fragmented small distribution center network were large. These savings were reinvested to further improve the operations and flexibility of the system. At the same time, it was acknowledged that a single management team would be created to oversee the central supply chain. Developing a material process strategy is the core focus of supply chain planning, and therefore a diverse team incorporating talent from the marketing, logistics, planning, and manufacturing side was important.

At the core linking this complex network was definitely a large undertaking, but one that was necessary for improved material and informational flow.

As the confectionary industry continues to develop, much more emphasis on supply chains to ensure customer demand is fulfilled on-time, and replenishment operations ensure that product is where it belongs, making money on the shelf. At the same time, upstream components such as retail location and inventory management will develop further to improve this process, and downstream raw material operational development will only strengthen the entire supply chain.

Dried Potato

Indonesia

Marketing channels facilitate the flow of potatoes from producers to consumers. Aside from the growers themselves, the participants in potato marketing activities are the assembly traders, commission agents, regional traders, exporters, wholesalers, and retailers.

In this case, government agencies play a supportive role, such as collecting and publicizing market information, issuing licenses to traders, and generally regulating fair trading practices.

In the domestic market, there are two types of wholesalers: those who reside in the production center and those who operate in the urban market center. A small quantity of potato seed and processed products were recorded as exports, but these were most likely re-exports of potatoes that were previously imported. Nearly all of Indonesia's potato exports are destined for either Malaysia (about 70 percent of total exports) or Singapore (30 percent of total exports). By contrast, most potato imports were in the form of processed products (Table 2). About 71 percent of the total potato imports in 1994-2000 were frozen French fries, mostly originating from North America. Other processed potato products, such as starch and flakes used in food processing, accounted for another 15 percent of the potato imports during this period. Most of these imports came from European countries.

This shows that there are two distinct 'markets' for potato in Indonesia, i.e. fresh table potatoes supplied from local production and processed potato products supplied mainly through imports. Frozen French fries are the most important imported potato product. With the Indonesian economic crisis, the demand for imported French fries declined sharply.

According to importers, price remains the most important factor in determining where they source their potatoes

In recent years, Chinese and Dutch exporters have been able to offer potatoes at lower prices than Indonesian exporters. This has been the principal reason for the loss of market share by Indonesia, according to the Singapore traders. Indonesia is a relatively high cost producer of potatoes but enjoys some advantages over temperate or other Southeast Asian countries. Its competitive advantage over temperate countries is its ability to provide a year-round supply. Its proximity to

Its proximity to Singapore and Malaysia is also a major advantage because of lower transportation costs, timely delivery, and freshness of product.

Singapore enforces strict pesticide residue limits on fresh fruits and vegetables, and shipments that do not meet standards are rejected. Although pesticide use on potatoes is relatively high in Indonesia, the issue of excessive pesticide residue has so far not been a constraint to exporting potatoes. No shipments from Indonesia to Singapore have been rejected for this reason. Indonesia's potato markets are increasingly

integrated with regional and global potato markets. Indonesian potato exporters face competition from Europe, China, and Australia/New Zealand in regional trade of fresh table potatoes.

Potato prices faced by Indonesian farmers are influenced by global supply and demand conditions and currency exchange rates. The principal reasons for the decline in potato exports from Indonesia were rapid growth in domestic demand and increased competition from other exporters, especially China and the Netherlands. The fall in consumer purchasing power and the devaluation of the rupiah as a result of the current economic crisis in Indonesia reduced domestic demand for potatoes and improved Indonesia's export competitiveness. These findings have implications for future directions of Indonesian potato trade.

South Asian Countries

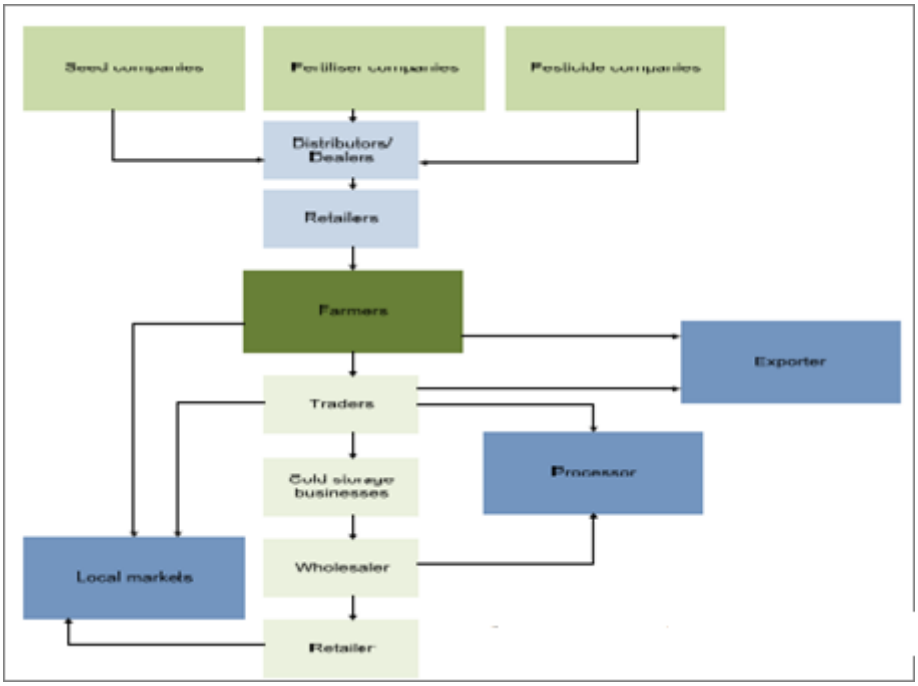
Consumption of potatoes and potato products is growing rapidly in Southeast Asia. A lack of locally grown potatoes suitable for processing has meant that processed potato products are mostly imported, while fresh potatoes are grown locally or regionally. Estimation of a two equation system of demand functions for fresh potatoes and frozen French fries shows that per capita consumption of both products are significantly influenced by income, price, the rate of urbanization, and country-specific factors. Single-equation estimates of potato demand in Jakarta, Indonesia, show that potatoes are not yet an important substitute for traditional staple foods.

Bangladesh

The majority of Bangladesh's potato production is used for direct consumption. The varieties used for table potatoes are not appropriate for processing (the dry matter content is too low) or export (foreign consumers have different tastes). Although in some export destinations, such as Sri Lanka, consumers prefer the taste of Bangladeshi potatoes.

The rapid growth of potato production in Bangladesh created problems in terms of cold storage.

Despite the number of cold stores in Bangladesh increasing from 77 in 1975 to 320 in 2010, the location of the capacities within the country is not optimal. In some areas storage space remains underused, whereas in others not all potatoes can be stored as intended. As a consequence, charges for storage differ considerably between regions. In addition to storage problems, for potato production, farmers are confronted with the high price of seed and fertiliser, no access to credit and lack of information on disease prevention and pest management. They seem to react to price increases (of fertiliser and other inputs) by reducing their use, which decreases their potato harvest the following year. High potato prices in any given year form an incentive for farmers to increase their production in the following year. As a consequence, prices vary considerably between seasons. Many observers of the market speculate about what is responsible for such variable prices. To a certain extent, limited storage capacities and the life of the product also limit the space for speculation. In saturated markets, relatively small changes of supply result in large jumps in price. Although the potato processing industries started in 2005, the channels of processing and exports are not yet sufficiently developed to absorb.



Conclusion

The above study shows that the developed countries like the US and EU have an effective model of cooperatives supported by efficient supply chains that make these countries the leaders in processed food categories. However, in case of India the production bottlenecks like cost diseconomies, poor quality, increasing domestic demand and inefficient supply chains are the major hurdles to the agricultural exports on the domestic front. Apart from this, declining world demand, competition from other countries, threat from substitutes, etc., are the major external constraints to Indian agricultural exports. Therefore, it may be suggested that the adoption of cooperative model, increase in the supply of agricultural products, diversification of agricultural exports, quality improvement, improvement of the cold storage facilities for the highly perishable agricultural exports, timely delivery of goods etc., are very crucial for the maximization of agricultural exports.

There are many other new technologies and management systems can be adopted in the food retailing and distribution industries. The goal is to create a more efficient, cost-effective, and responsive distribution channel. Management systems play a huge role in maintaining product integrity and distribution efficiency. Manufacturers need to be aware of these new technologies and management strategies. The following are a few technologies that have been adopted or are being developed for use in the food distribution industry.

- **Electronic data interchange (EDI)** is a substitute for paper invoicing, instead using electronic resources such as e-mail and the Internet.
- **Continuous replenishment** uses shared computer networks between retailers and suppliers to view inventory at any time. Sometimes called "just-in-time" inventory or supply management.
- **Electronic consumer response (ECR**) is a demand-driven replenishment system designed to link all parties in the distribution channel to create a massive flow-through distribution network.

Replenishment is based on consumer demand and point-of-sale information. Overall, ECR translates to lower transaction costs for retailers.

- **Radio frequency identification (RFID),** automated radio signal identification, is used by food distributors and retailers for inventory purposes. RFID allows identification of merchandise while materials are being handled and in transit. Using RFID technology, along with ECR, helps retailers and distributors reduce costs and increase efficiency.

Above all, the government has to take some timely measures through some reforms in its EXIM policy, to fulfill the needs of the exporters of agricultural products.

CHAPTER 9 SPS MEASURES AND THEIR MITIGATION

In the last five years there have been over 800[12] cases of rejections in agricultural and processed food exports from India. The maximum cases of rejections have been reported from the member states of the European Union (EU). Since 2008, 763 notifications have been issued by the EU under Rapid Alert System for Food and Feed (RASFF) mostly for rejecting the consignments. The other countries include Taiwan, Japan, China, Indonesia, Malaysia, Thailand, Korea and United Arab Emirates (UAE). US FDA (United States Food and Drug Authority) has repeatedly rejected[13] Indian processed foods on the following reasons:

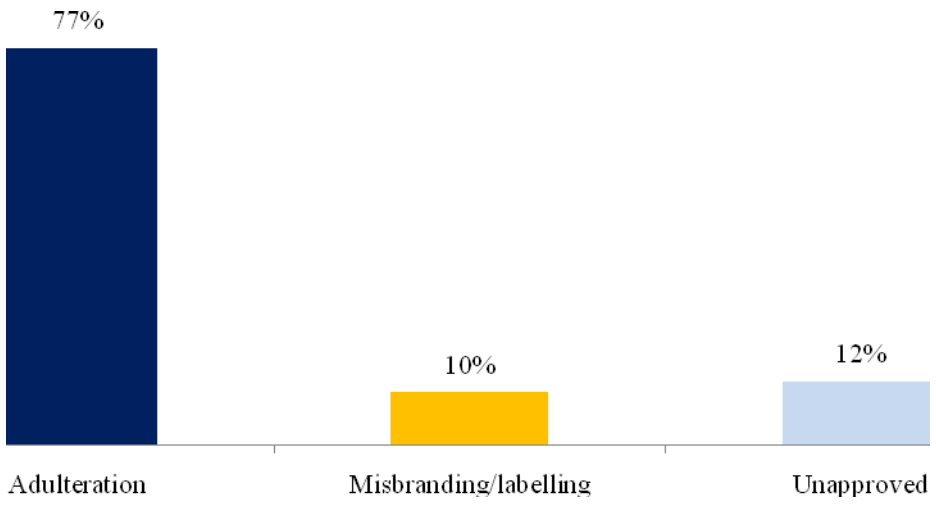
1. Incorrect Labeling
2. Maximum Residue levels
3. Contamination/unhygienic condition: The reasons for this range from presence of mold and bacteria etc.

An analysis of the recent SPS alerts issued by US FDA for the month of June 2015 for Indian processed products gives insightful information. Overall there were 97 alerts for processed food products. The main categories for the alerts were as follows:

1. Adulteration: Contamination/MRLs
2. Misbranding: Incorrect label ling
3. Unapproved product

The following figure provides the breakup.

SPS Alerts issued against Indian Processed food products in June 2015[14]



[12] **http://archive.indianexpress.com/news/food-agri-export-rejections-cross-800-cases-over-five-years/1115914/**
[13] **http://blogs.wsj.com/indiarealtime/2015/06/11/before-the-maggi-noodles-scare-look-at-what-the-u-s-fda-found-in-indian-snacks/**
[14] **http://www.accessdata.fda.gov/scripts/importrefusals/ir_byCountry.cfm?DYear=2015&DMonth=6**

The following table provides us with the name of the organizations and category of processed food products:

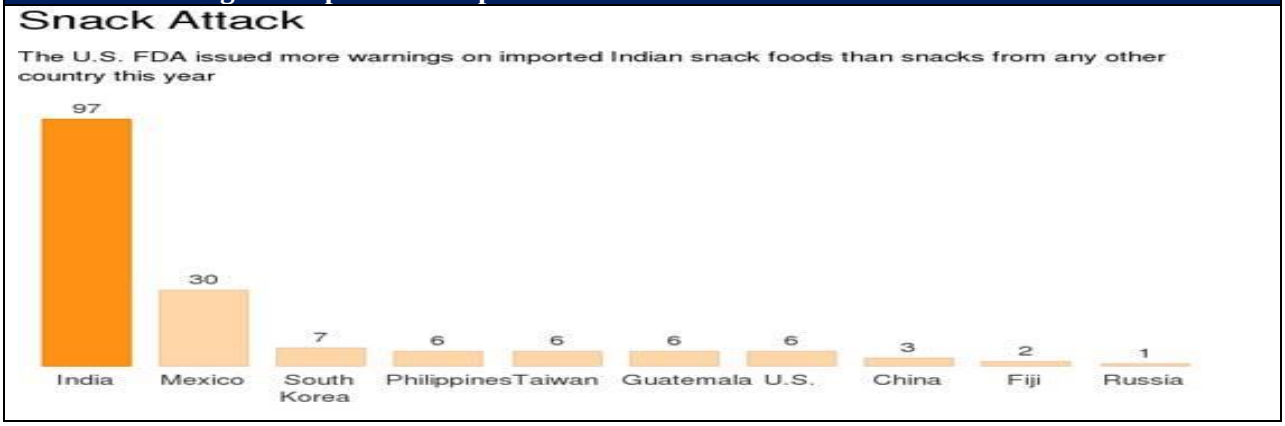
Sl No	Name of Firm	Category of Processed Food Product
1	Dabur india limited	Animal by-products and extracts, n.e.c.
2	Adani food products pvt. Ltd	Capsicums (cayenne chili, hot peppers), ground, cracked (spice)
3	Mdh ltd.	Capsicums (cayenne chili, hot peppers), ground, cracked (spice)
4	Vidhi dyestyffs mfg. Ltd.	Cert. Colors for use in foods only n.e.c.
5	Anil & company	Chana dal
6	Anil & company	Chana dal
7	Mondelez india foods limited	Chocolate bars
8	Unique fragrances	Coriander, ground, cracked (spice)
9	Parayil exports	Coriander, ground, cracked (spice)
10	Vijay enterprise	Coriander, whole (spice)
11	Haldiram snacks pvt. Ltd.	Corn (whole kernel) snacks, vegetable snacks (other than pulses) baked
12	Hindustan unilever limited	Custard, regular, vanilla or vanillin flavored
13	Cadbury india limited	Foods with supplemental nutrients added, with or without artifical sweetners
14	Haldiram snacks pvt. Ltd.	Fried snack foods, n.e.c.
15	Haldiram snacks ltd	Fried snack foods, n.e.c.
16	Haldiram snacks pvt. Ltd.	Fried snack foods, n.e.c.
17	One earth organic pvt ltd	Garam masala, liquid without salt
18	Dabur india limited	Herbals & botanicals (not teas), n.e.c.
19	Aloe plus international	Jellied candy, soft (jelly beans, gum drops, etc.), without nuts and fruit (without chocolate)
20	Hindustan Unilever limited	Mixed fruit, jam, jelly, preserves, marmalade, butter or candied, n.e.c.
21	Mahashian di hatti pvt. Ltd.	Mixed spice and seasonings, ground, cracked, without salt, n.e.c.
22	Haldiram snacks ltd	Multiple food specialities, side dishes and desserts, n.e.c.
23	International freezfish exports (unit ii)	Octopus, other aquatic species
24	Capital foods limited	Oriental noodles (flavored with shrimp,chicken,beef,lobster,crab,plain,etc.)
25	Abhaya exports ltd	Other bakery products, n.e.c.

26	Naveena quality foods pvt ltd	Other bakery products, n.e.c.
27	Shri mahila griha udyog	Other bakery products, n.e.c.
28	Sanjeevani organics	Other bakery products, n.e.c.
29	Haldiram snacks ltd	Peanut, shelled
30	Srss agro private limited	Rice, basmati, processed (packaged)
31	Gautam techagro india pvt ltd	Rice, basmati, processed (packaged)
32	Radikal foods usa ltd	Rice, basmati, processed (packaged)
33	Three sixty exports	Rice, basmati, processed (packaged)
34	Basic india limited	Rice, basmati, processed (packaged)
35	M.r. overseas	Rice, basmati, processed (packaged)
36	Srss agro private limited	Rice, basmati, processed (packaged)
37	Anil & company	Rice, plain (white or polished) processed (packaged)
38	Forstar frozen foods pvt. Ltd	Shrimp and prawns, aquaculture harvested fishery/seafood products
39	Karachi bakery	Snack foods not elsewhere mentioned, n.e.c.
40	Aloe plus international	Soft drinks and waters not mentioned elsewhere, n.e.c.
41	Ushodaya enterprises limited	Spices and seasoning, ground, cracked, with salt, n.e.c.
42	Mdh ltd.	Spices and seasoning, ground, cracked, with salt, n.e.c.
43	Haldiram snacks pvt. Ltd.	Starch snacks, n.e.c., baked
44	The grand sweets & snacks	Tamarind (subtropical and tropical fruit purees) & pastes
45	Aayu impex	Tamarind, dried or paste
46	Aayu impex	Tamarind, dried or paste
47	Bharat overseas	Tamarind, dried or paste
48	Sanjeevani organics	Whole spice, n.e.c.

They are described in the following sections.

In 2011, US FDA had issued 97 warnings to India. This was 3 times the warning issued to Mexico, the country with the second highest warnings at 30. In the month of June 2015, US FDA has issued 170[15] warning on Indian products. The common reasons for processed food products are Labeling, Misbranding and Hygienic products including pesticide contamination.

US FDA warnings on imported food products from various countries in 2011



[15] **http://www.accessdata.fda.gov/scripts/importrefusals/ir_detail.cfm?EntryId=9GX-0235122-8&DocId=7&LineId=1&SfxId=**

Apart from USA, countries like Australia and New Zealand has also issued rejections for processed food products from India. The key reason behind this is labeling law and policy in Australia which was enacted in 2011. The following section will highlight the Sanitary and Phyto-Sanitary measures adopted by importing countries in the view of the above three highlighted issues in rejection of processed Indian food products. They are described categorically in the following table.

Target Locations	Labeling
EU-27	▪ The name under which the product is sold. ▪ The list of ingredients, in descending order of weight. ▪ The net quantity of prepackaged foodstuffs expressed in metric units (liter, centiliter, milliliter, kilogram or gram). ▪ The date of minimum durability: the shelf life is indicated by the words "Best before..." when the date includes an indication of the day or by "Best before end of..." in other cases ▪ The date has to be given in order of day-month-year ▪ Any special storage conditions or conditions of use. ▪ The name or business name and address of the manufacturer or packager ▪ Treatments undergone, with specific indications for irradiated foods and deep-frozen foods ▪ Labeling has to be in a language easily understood by consumers; this is in practice the official language(s) of the member state ▪ Country of origin labeling is mandatory Quick-frozen foodstuffs sold to the final consumer should carry the following additional labeling indications: the product name with the indication “quick-frozen”, the date of minimum shelf life, the period during which the purchaser may store the product, the storage temperature and/or type of storage equipment required, batch identification and a clear indication of the type “do not re-freeze after defrosting”. Irradiated foods or foods containing irradiated ingredients must be labeled "irradiated" or "treated with ionizing radiation".
United States of America	Exporting facilities that manufacture, process, pack, or hold food must register with FDA biennially (every two years). 1. Place all required label statements on the front label panel (the principal display panel or PDP), or, 2. Place certain specified label statements on the PDP and other labeling on the information panel (the label panel immediately to the right of the PDP, as seen by the consumer facing the product). 3. Place the statement of identity, or name of the food, and the net quantity statement, or amount of product, on the PDP and on the alternate PDP. 4. Information label statements include the name and address of the manufacturer, packer or distributor, the ingredient list, nutrition labeling and any required allergy labeling

	5. For information panel labeling, use a print or type size that is prominent, conspicuous and easy to read. Use letters that are at least one-sixteenth (1/16) inch in height based on the lower case letter "o". The letters must not be more than three times as high as they are wide, and the lettering must contrast sufficiently with the background so as to be easy to read. Do not crowd required labeling with artwork or non-required labeling. 6. Food labels must list: 1. Name and address of the manufacturer, packer or distributor. Unless the name given is the actual manufacturer, it must be accompanied by a qualifying phrase which states the firm's relation to the product (e.g., "manufactured for "or "distributed by"); 2. Street address if the firm name and address are not listed in a current city directory or telephone book; 3. City or town; 4. State (or country, if outside the United States); and 5. ZIP code (or mailing code used in countries other than the United States).
Japan	1. Alpha-numeric manufacturer's identification (ID) code that corresponds to a specific production facility 2. The product label must also contain one of the following: 1) customer service contact information, 2) company website address, or 3) names, addresses, and ID codes for all production facilities. 3. Contain the name and address of both the manufacturer and the distributor of a product 4. Allergen Labeling: Not required for the identified products. 5. Nutritional Labeling: a. Mandatory: Energy, Protein, Fat, Carbohydrate, Salt Equivalent b. Voluntary But Recommended: Saturated Fat, Dietary Fiber c. Voluntary: Available Carbohydrate, Sugars, Cholesterol, Vitamins and Minerals
China[16]	1. Labeling of prepackaged food for direct delivery to consumers shall include name of foods, list of ingredients, net weight and configuration, name of the food, address and contact information of manufacturers and/or distributors, date of manufacture and date of minimum durability, conditions for the storage, food production license number, code of the product standard and other contents needed to be labeled 2. The specific name of the food shall be presented in the prominent place of the label, and shall clearly indicate the true nature of the food. 3. The labeling of the prepackaged foods shall declare the list of ingredients. 4. All ingredients shall be listed in descending order of their weights added in the process of manufacture or preparation of the food; those ingredients constituting less than 2% of the food may not be listed in descending

[16] ***China National Standard GB7718-2011***

	order. 5. Where an ingredient is itself the product of two or more ingredients (except compound food additives), such a compound ingredient may be declared, as such, in the list of ingredients, provided that it is immediately accompanied by a list, in brackets, of its primary ingredients in descending order of proportion. Where a compound ingredient (for which a name has been established in a national, trade or provincial standard) constitutes less than 25% of the food, its primary ingredients need not be declared. 6. The names of food additives shall be declared in general names in accordance with GB 2760 declaring the class name and international code of food additives 7. Where the labeling of a food places special emphasis on the presence of or adding one or more valuable and/or characterizing ingredients or components, the percentage of the emphasized ingredients added at the time of manufacture or the content of the emphasized components shall be declared 8. The net weight of the packaged food 9. The minimum font size of net weight declaration shall be in accordance: a. $Q \leq 50$ ml ; $Q \leq 50$g: 2mm b. 50 ml$< Q \leq$ 200 ml ; 50 g $< Q \leq$ 200g: 3 mm c. 200 ml $< Q \leq$ 1L ; 200 g $< Q \leq$ 1 kg: 4 mm d. $Q >$ 1 kg ; $Q >$ 1 L: 6 mm 10. The net weight and the name of the food shall be presented in the same display panel of the package (container). 11. In the case of a solid food packed in a liquid medium, the solid food is the main ingredient, in addition to the declaration of net contents, the drained (solid) contents shall also be declared, in weight or percentage 12. For prepackaged food containing small units of prepackaged food, in addition to the declaration of net weight, the configuration shall also be declared on the outer package, except for those the inner pack does not be sold as individual units, for example, bits of candies, packets of cookies, pouches of succade and so on. 13. The country or region (Hong Kong, Macao or Taiwan) of origin, and the name, address and contact information of the agent, importer or distributor registered in the People's Republic of China, shall be declared. 14. The date of manufacture and the date of minimum durability shall be clearly declared 15. Any special conditions for the storage of the food shall be declared on the label 16. The label of a food which has been treated with ionizing radiation shall be marked ―irradiated food in close proximity to the name of the food. 17. Any ingredient which has been treated with ionizing radiation shall be declared in the table of ingredients
Russian Federation[17]	The following information must be presented in the Russian language: 1. Name, country, address of producer, packer, exporter and importer 2. Country of origin, trademark, net weight or quantity, composition, nutritional value based on the specificity

[17] ***http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20and%20Agricultural%20Import%20Regulations%20and%20Standards%20%20Narrative_Moscow_Russian%20Federation_11.08.2009.pdf***

	of the product, storage conditions 3. use-by date or shelf-life expiration date, regulatory or technical documents with which the products can be identified 4. Confirmation of conformity and other data. 5. food additives, biologically active additives, flavorings, components of non-traditional composition (including components from raw materials containing protein that does not exist naturally and was added while manufacturing the product) 6. food products that are products of biotechnology, obtained from products of biotechnology, or contain components from products of biotechnology 7. If more than 2 percent of the recommended daily allowance of proteins, fats, carbohydrates, or calories is included in a 100-gram serving, this information must be included on the label 8. The label must also indicate if a 100-gram serving contains more than 5 percent of the daily recommended allowance of minerals or vitamins 9. For frozen or processed vegetables, Products must be accompanied by a sanitary-epidemiological conclusion. For 07013 - leguminous dried, de-shelled, cleared from the seed skin, chipped or non-chipped – products are subject to phytosanitary inspection.
Saudi Arabia[18]	The labeling requirements are as follows: 1. Labels of prepackaged foodstuffs and the attached labeling shall be in Arabic language. When one language or more is used in addition to Arabic language, all information in the other languages shall be the same as the information written in the Arabic language. 2. Name of foodstuff: Specific, not generic, name of the prepackaged food. Names and phrases provocative to Islamic religious feelings such as "made of pork flesh or its derivatives," "Alcoholic beverages," or any doctrinally forbidden symbols and marks in Islamic countries such as the sign of the Cross, etc. should not be used. 3. List of Ingredients: Complete list of ingredients in descending order of proportion, including additives permitted for use according to Saudi or International Standards and Legislation such as preservative, coloring matters, etc. • Net contents in metric units (volume in case of liquids). 4. Name and address of the manufacturer, packer, distributor, importer, exporter or vendor. 5. Special Storage, transportation and preparation instructions, if any. 6. Additives 7. Country of Origin 8. Shelf life: Shelf life can only be shown by clear and unambiguous production and expiration dates. 9. For coloring matters, their mixtures, preparations and diluents used in foodstuffs, the following additional information must be declared:

[18] ***http://agritrade.iift.ac.in/html/Training/Market%20study/Saudi_Arabia%20report.pdf***

	• Common name • Color index number • Name of solvent or diluents • Production and expiration dates in a non-coded manner (day-month-year) • Dye purity • The statement "Free from alcohol" • The statement "Color matter for use in foodstuffs." 10. For Flavors permitted for use in Foodstuffs common name and code number (if found) must be declared on food products containers contained flavors. 11. For preservatives permitted for use in food products, common name or EEC number and a statement "Preservative for Use in Food Products" in case of preservatives containers. 12. For emulsifiers, stabilizers and thickeners permitted for use in foodstuffs, the following additional information must be declared: Common name or EEC no. 13. In case of gelatin, lecithin and mono and diglycerides the source shall be mentioned. 14. For Sweeteners Permitted for Use in Food Products: • The name of sweeteners or INS numbers • Food products formulated specifically for use by diabetics or for other special nutritional uses shall contain the statement "Food for special dietary use or food for diabetic." • The amount of sweeteners matter, mg/liter or kg in case of using combination of sweeteners, the amount of each in combination shall be declared. 15. The following warning must be declared: • In case of aspartame, "Not to be used by persons who have phenyl ketonuria." • In case of saccharine, "Use of this product may be hazardous to your health because it contains saccharin which has been determine to cause cancer in laboratory animals." 16. In the case of sugar alcohol "Excess of consumed quantity may cause diarrhea." 17. The following additional labeling information must be declared for antioxidants permitted for use in foodstuffs: • Common name or EEC number • A statement "Antioxidants permitted for use in foodstuffs" in case of antioxidant containers.
Canada[19]	When a food product is wholly manufactured outside of Canada, the label must show that the product is imported. This information can be provided in three ways: • the name and address of the Canadian company with the country of origin of the product, • the name and address of the foreign manufacturer, or

[19] ***http://www.alimentheque.com/divers/GuideFoodLabellingAdvertising_CFIA_dec2011.pdf***

	• the statement "imported for" or "imported by" followed by the name and address of the Canadian company. **Modified Atmosphere Packaged Foods** Modified Atmosphere Packaging (MAP) is a technique that alters the proportion of gases within a package in order to improve the shelf life of fresh or minimally processed foods. Manufacturers must bear this in mind when applying "best before" dates as required. As the purpose of MAP is to extend the shelf life of a food, if the product is removed from aMAP container or package at retail, the durable life of that product may change and this must be factored into the establishment of appropriate durable life information. If a manufacturer uses MAP, durable life information must be provided in one of the following manners when sold at retail: 1. Product in MAP when packaged by manufacturer and sold in original packaging: Manufacturer required to apply durable life date and storage instructions (if appropriate) on label.
Malaysia	1. If the GE content is not more than three percent, labeling is not required, "provided that this presence is adventitious or technically unavoidable." 2. For single ingredient foods, the words "genetically modified (name of the ingredient)" must appear in the main display panel. 3. For multi-ingredient foods, the words "produced from genetically modified (name of the ingredient)" should appear in list of ingredients and "contains genetically modified ingredient" must be stated on the main display panel. 4. Highly refined foods, defined as those where processing has removed all novel DNA and protein, are exempt from the labeling requirement. (e.g.: vegetable oils, corn syrup, acidic foods, and salty foods). 5. The language may be in Bahasa Malaysia or English, and in either case may include translation thereof in any other language 6. The appropriate designation of the food or a description of the food containing the common name of its principle ingredients. The lettering on the label shall be so prominent in height, visual emphasis, and position to be conspicuous by comparison with any other matter appearing on the label. 7. In the case of mixed or blended food, words which indicate that the contents are mixed or blended, as the case may be, and such word shall be conjoined with the appropriate designation of the food, in the following form: "mixed" (here insert the appropriate designation of the food); or "blended" (here insert the appropriate designation of the food), provided that the word "mixed" or "blended" shall not be conjoined with the appropriate designation of any mixed or blended food which does not comply with the standard prescribed by these Regulations. 8. A statement as to the presence of alcohol, in capital bold-faced lettering of a non-serif character not smaller than 6 point, in the form- "CONTAINS ALCOHOL" or in any other words to this effect. This statement shall appear immediately below the appropriate designation of the food. 9. Where the food consists of two or more ingredients, other than water, food additives and nutrient supplement, the appropriate designation of each of those ingredients in descending order of proportion by weight and (if required) a declaration of the proportion of such ingredient: where the food contains an

ingredient known to cause hypersensitivity, a statement indicating that the food may cause hypersensitivity.

10. Where the food contains edible fat or edible oil or both, a statement as to the presence in that food of such edible fat or edible oil or both, together with the common name of the animal or vegetable, as the case may be, from which such fat or oil is derived
11. Where the food contains food additive, a statement as to the presence in the beer of such food additive, in the form-"contains permitted (state type of the relevant food additive)" provided that in the case of coloring substance or flavoring substance it shall be sufficient to state the common name or the appropriate designation of that food additive in place of the chemical name.
12. A statement of the minimum net weight or volume or the number of the content of the package; in the case of food packed in liquid, a statement of the minimum drained weight of the food.
13. In the case of imported food, the name and business address of manufacturer or packer or the owner of the rights of manufacture, or the agent of any of them, and the name and business address of the importer in Malaysia and the name of the country of the origin of the food.

Form and manner of labeling:

1. All particulars required above shall appear conspicuously and prominently in the label.
2. All particulars to appear on a label shall be written in no smaller than 10 point lettering and with equal prominence with any other matter appearing on or attached to the package.
3. Every label shall be legible and durably marked either on the material of the package or on material firmly or permanently attached to the package.
4. A label may be firmly placed inside a package if the package is made of :
   - A clear transparent material
   - The food contained in the package is not ready for direct consumption or in the case of food ready for consumption, is completely enclosed in its natural shell or pod or interior wrapper such that it has no direct contact or is not likely to come into contact with the label
   - No label shall appear on the extra wrapper of any food
5. Except for intentionally accepted unit symbols of weights and measures, the lettering of every word or statement required to appear on labels shall be all capital letters or all lower case letters; or lower case letters with an initial capital letter.
6. Where the package to be labeled is so small as to prevent the use of letters of the required size, letters of smaller size may be used if they are of the largest size practicable in the circumstances and are in any event no smaller than two points.
7. All lettering shall appear in a color that contrasts strongly with its background.
8. Date marking should be done in the following manner:
   - EXPIRY DATE or EXP DATE (here insert the date, expressed in day, month and year or in month and year)

	• USE BY (here insert the date, expressed in day, month and year or in month and year or in month and year) CONSUME BY or CONS BY (here insert the date, expressed in day, month and year or in month and year) • The date of minimum durability in respect of any food shall be shown in "BEST BEFORE or BEST BEF (here insert the date, expressed in day, month and year or in month and year) 9. Nutritional Labeling: There shall be written on the label of the food specified in the following manner: • The amount of energy, expressed in kilocalorie (kcal) or kilojoule (KJ) or both per 100g or 100 ml or per package if the package contains only a single portion and per serving as quantified on the label; • The amount of protein, available carbohydrate (that is carbohydrate excluding dietary fiber) and fat, expressed in g per 100g or per 100 ml or per package if the package contains only a single portion and per serving as quantified on the label.
Brazil[20]	The labeling requirements are as follows: 1. Items generally required on front panel: • Technical name, according to MAPA or ANVISA classification • Brand • Quantity 2. Items generally required on side panel: • List of ingredients Country of Origin Producer contact information (complete name and address) • Importer Information (corporate name, address, corporate ID) • Date of production • Date of product expiration • Lot Storage care Instructions for use or preparation (if necessary) • The expression “Contains Gluten” or Does Not Contain Gluten”, clearly visible • Nutritional information
Singapore	The following labeling requirements are needed to be provided in English: 1. Name or description of the product. 2. Statement of Ingredients. 3. Declaration of Foods and ingredients known to cause hypersensitivity. 4. In addition to the above the following information is needed to be included: • Cereals containing gluten • Crustacean and crustacean products • Eggs and egg products • Fish and fish products

[20] ***http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20and%20Agricultural%20Import%20Regulations%20and%20Standards%20-%20Narrative_Brasilia_Brazil_12-19-2011.pdf***

	• Peanuts, soybeans and their products. • Milk and milk products • Tree nuts and nut products. • Sulphites in concentrates of 10mg/kg or more. • Net Content • Wording size for label • Name and address of manufacturer, importer or package or distributor • Country of Origin of the product 5. Nutrition labeling with reference to: (a) Energy; (b) Salt, sodium or potassium; (c) Amino acids, carbohydrates, cholesterol, fats, fatty acids, fiber, protein, starch or sugars; or (d) Any other nutrient; but does not include a statement of ingredients or a declaration or claim relating to a vitamin or mineral. • Irradiated foods, and foods containing irradiated ingredients and irradiated food ingredients are required to clearly disclose on their label that they have been irradiated or contain irradiated products, e.g. the following words, to be printed in letters of note less than 3 mm height: "TREATED WITH IONIZING IRRADIATION" or "IRRADIATED (here insert the name of the food). When an irradiated food is used as an ingredient in another food, it should be declared in the statement of ingredients. And, if a single ingredient product is prepared from a raw material which has been irradiated, the label of the product should contain a statement indicating the treatment.
Republic of Korea[21]	1. All imported food products are required to be labeled with the necessary information in Korean. 2. Labels should have the following inscriptions printed in letters large enough to be readily legible: a. Product name. The product name should be identical to the product name declared to the licensing/inspection authority. b. Product type. This is mandatory for specially designated products, such as teas, other beverages, extract products, special purpose foods, etc. Importer's name and address, and the address where products may be returned or exchanged in the event of defects. c. Manufacture date (date, month, and year). This is mandatory for specially designated products, such as boxed lunches, rice roll in seaweed, hamburgers, sandwiches, sugar, liquor (excluding beer and Korean traditional rice liquor since they are required to indicate shelf life), and salts. d. For liquors, a manufacture number (lot number) or bottling date can substitute for the manufacture date. e. Shelf life or best before date. Food product labels should indicate the manufacturer-determined shelf life. Products including: jams, saccharide products (e.g. dextrin, oligosaccharide, and fructose), teas, coffee, sterilized beverages, bean based sauce and paste, sterilized curry products, vinegar, beer, starch, honey, wheat flour, etc. can use either a best before date or a shelf life date on the product label.

[21] ***http://www.mfds.go.kr/eng/index.do?nMenuCode=67***

	f. If various kinds of products are packaged together, the shelf life expiration date of the product with the shortest life should be noted on the label. g. Contents (Calories). Weight, volume or number of pieces should be indicated. If the number of pieces is shown, the weight or volume must be indicated in parentheses. Calories are only required for food products subject to nutritional labeling. h. Ingredient names and content. The names of all ingredients have to be included on the Korean language label except for a product whose area of the principal display panel is not larger than 30 cm^2. For the product whose area of the principal display panel is not larger than 30 cm^2, it is required to list the top five ingredients only. i. Nutritional Labeling Requirements: Nutritional labels (example below) must be written in the Korean language and use the Korean nutrient reference values. j. Food additives like synthetic sweeteners, coloring agents, synthetic preserves, antioxidants and bleaching agents also must be labeled. k. Nutritional labels must be written in the Korean language and use the Korean nutrient reference values
Vietnam[22]	The labeling requirements are as follows: 1. Product name; composition; product weight; production date; timeline for use; direction for use and storage instruction; name of the personal or the organization responsible for the goods; origin; number of receipts of conformity statement or certificate in accordance with the provisions of food safety; recommendations or warning on food safety. 2. All ingredients forming the products must be listed on food labels, unless the product has a single composition. 3. Ingredients are written in ascending order (from the higher to the lower) of weight or weight proportion (% weight) of each food ingredient. The phrase "composition" must be written before the ingredients listed. 4. Where an ingredient is itself the product of two or more ingredients, such a compound ingredient must be declared, with its ingredients in brackets in descending order of weight. Where a compound ingredient constitutes less than 5% of the food, the ingredients need not be declared, except food additives having a function for the final product. 5. It is compulsory to declare on the label if food product containing one or several ingredients listed as below: a. Cereals and food containing gluten; i.e., wheat, rye, barley, oats, spelt or their hybrid strains and products of these; b. Crustaceans and products of these; c. Egg and egg products; d. Fishery and fishery products e. Peanut, Soya and their products; f. Milk and milk products (including lactose s, sugar, milk);

[22] http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Labelling%20Guidelines%20Revised%20for%20Pre Packaged%20Food%20and%20Additives%20_Hanoi_Vietnam_1-20-2015.pdf

	g. Nut and nut products; and h. Sulphite (sulphuric salt and acid) in concentrations of 10 mg/kg or more 6. Food quantity must be written on the food label according to measurement unit of International System. 7. Food quantity must be recorded in the following methods: a. According to actual volume for liquid food. b. According to net weight for solid food. c. According to net weight or actual volume for foods which are both liquid and solid (semi-solid) or thick food. 8. In the case the food is packaged in liquid environment, the weight of dry food must be declared next to the net weight. 9. The production date can be written as follows: "Production date" or "NSX"..... Numeral indicating date, month, year can be written in the following ways: the date consists of 2 numerals, month consists of 2 numerals, and year consists of 2 or 4 numerals. Dot symbol (.), dash (-), cross (/) or no symbol, can be used between date, month, and year. In the most abbreviated case only 6 numerals shall be used. 10. The shelf life must include the following information: a. Date and month for product having shelf life less than three months b. Month and year for product having shelf life more than three months c. For imported product, original country must be written on the label in accordance with the regulation of the product's origin. 11. In case the product's packaging is changing or packaged a country other than the country of production, in addition to original country of the product, name of the country where the product is finally packaged shall also be stated. 12. In the case of food manufactured, processed, preserved using irradiated technology, the phrase "irradiated food", or an international-recognized irradiation food symbol accepted by Vietnam is to be printed on the label.
Mexico	1. The original English container can be used as long as a Spanish sticker is attached that meets all the labeling requirements or the product can be packaged for the local Mexican market using Spanish. The first option is usually a better option for new-to-market products. All information must be in Spanish. Information in English may appear on the label, but cannot be substituted for the information that is required to be in Spanish. 2. Product Name/Product Description: Raw or Generic Description of the product must be placed in the Main Exhibit Panel of the product package or label. It must be in Spanish, or English and Spanish. If the latter is applied, font sizes and colors must be equal. - Brand Name. - List of Ingredients. The ingredient list must be headed by the word ingredients in Spanish ("Ingredientes"); ingredients must be listed in descending order by quantity. 3. The net content statement has to be placed in the main exhibit panel, it must be space fee above and below with at least the same height of the font on the left and the right with the width of two characters of the same font. The thickness of the font must be at least 1/3 of the height of the font used.

	4. The net weigh declaration must be made in metric units (grams, kilograms, or liters). 5. The manufacturer's information is optional, 6. Country of origin. Must be in Spanish, or in Spanish and English and placed anywhere on the package or label. 7. Batch Number. Information may be placed anywhere on the package but must be visible at all times. 8. Expiration Date. According to Codex International Regulations any dating system is accepted DD/MM/YY or MM/DD/YY. It may be placed anywhere on the package. The preferred date of consumption might be mandatory on specific products. 9. Preferred Date of Consumption. This is non-mandatory information and if included, the preferred date of consumption must state month and year for products whose expiration is 3 or more months, or day and month for products whose expiration is 3 months or less. If this date is specified, a note on proper handling practices to preserve the product in optimum conditions must be added. 10. Nutritional Information: This information is normally voluntary but it becomes mandatory when the manufacturer declares any quantitative or qualitative nutritional characteristic of the product. If nutritional information is included, it must state at least energy content; amount of proteins, carbohydrates and fats; amount of sodium; and the amount of the nutrient for which a claim is made. 11. The inclusion of some nutrients such as proteins, vitamins, and/or minerals should be included only if they supply more than 5% of the Recommended Daily Ingestion-IDR (recommended daily allowance). 12. The inclusion of the fat content requires a breakdown of all the types of fat and their percentages using the expression "del cual" (of which) polyunsaturated fat, monounsaturated fat, saturated fat and cholesterol. - Include the number of portions per container. 13. Alcoholic beverages containing alcohol of 2% to 55% by volume are required to exhibit the following information on their packaging and or label 14. Alcohol content. Percentage of volume of alcohol at 29C: % Alc. Vol. - Each container must have a visible coded batch number 15. For wine, with a declaration "100% de uva" (made 100% with grapes), which must be true.
Chile	The labeling requirements are as follows: Labels must be in Spanish, but the information may be repeated in another language. Sticker labels may be used, but must first be approved. Labels must bear the following information: • Name of the food product. • Net content in metric units. Net content stated in units of the metric system or the international system using the unit symbol or the complete word. Net content figures shall not be accompanied by any ambiguous term. Food items packed in a liquid medium shall carry, in addition to net content, a statement giving the drained weight of the item in units of the metric system or international system. • Name or company name and address of the manufacturer, packer, distributor, or importer, as appropriate. • Country of Origin shall be stated clearly on domestic as well as imported products. • Number and date of resolution together with the name of the health agency responsible for authorizing the

	establishment processing or packing the item or authorizing import. • Date of manufacture or packing date. [A production lot code may be used.] • Expiration date, or shelf life (in terms of days, months or years). Items where processing date is given with the lot key number shall show duration by stating the expiry date, while items specifying the processing date may use either expiry date or term of duration. All items stated to be of "indefinite duration" must show the date when processed. • List of all ingredients in decreasing concentration, including quantity or percent. • List of all additives in decreasing concentration. • Instructions for storage, including refrigeration, if special conditions are required for the product to satisfy its minimum duration period or last to its expiration date. • Instructions for use. **Nutritional Labeling:** A nutritional label must contain the following information. • Value of energy in calories. • Quantities of protein, available carbohydrates, and fats in grams (available carbohydrates being understood to mean total carbohydrates excluding dietary fiber). • Quantity of any other nutrient, dietary fiber, and cholesterol, concerning which a representation of properties is made. Cholesterol content shall be included in all food items representing nutritional or health-related claims in connection with fat or cholesterol. Values are to be given per 100 g or 100 ml, and per serving • When a representation of nutritional properties is made regarding quantity or type of carbohydrates, total sugars shall be given. Quantity of starch and other carbohydrate constituents may be shown also. All this information shall be stated immediately following the representation of total carbohydrate content. • When a representation of nutritional properties regarding dietary fiber is made, quantity and percentage of soluble and insoluble fiber shall be shown. • When nutritional properties associated to quantity and type of fatty acids are specifically represented, quantities of saturated, monounsaturated, polyunsaturated fatty acids, and cholesterol shall be given immediately following representation of total fat content.
Turkey	Every food product in the market has to be labeled clearly, completely and accurately in the Turkish language. The following information must be printed on all food labels, imported: • Name and brand of product • Name and address of producing, packaging and importing companies • Production batch number and date • Place of Production and Country of Origin • Expiration date/shelf life • Nutrition and caloric values

	• Net weight/volume • List of ingredients and additives • Ministry of Agriculture production or import license number/and date • Storage, preparation and usage instructions when needed , • Name and type of packing material • Percentage of alcohol (if the product contains more than 1.2 percent alcohol). • If the product has a shelf life of less than three months, it must include the day/month/year of expiration
United Arab Emirates[23]	While the UAE has accepted English-only labels in the past, bi-lingual labels are now required. 1. A food label must contain the following information: 2. Product name (name of the food) in a prominent position on the label; 3. Ingredients in descending order of proportion 4. Additives using their "E" number (group names are accepted) 5. The foodstuff and ingredients which are known to cause hypersensitivity shall always be declared; 6. Net content in metric units; 7. Production and expiry dates: a. Production/expiry dates must be engraved, embossed, printed or stamped directly onto the original label or primary packaging at the time of production, using indelible ink. b. Only one set of P/E dates on the label is permitted c. P/E dates must be printed in the following fashion, depending upon the shelf-life of the product: i. Day/month/year for products with a shelf-life of three (3) months or less ii. Month/year for products with a shelf-life longer than three (3) months 8. The word "Production" or the letter "P" must precede the production date. The expiry date must be preceded by one of the following statements: "Expiration (date)"; "Fit for…..from the date of production"; "Use by (date);" "Use before (date);" "Sell by (date);" "Valid until (date) from the date of production;" or the letter "E.″ 9. Country of origin; 10. The name and address of the manufacturer, producer, distributor, importer, exporter or vendor shall be declared on the label; 11. Special storage and preparation instructions, if any; 12. Foods making health claims must be labeled accordingly and require pre-approval by the Ministry of Health; 13. Lot identification. 14. Alcoholic beverages and alcohol containing products can be imported but only through authorized importers who run their own retail shops. There are no special labeling requirements for alcoholic beverages beyond what is typically required in the country of origin

[23] ***http://agritrade.iift.ac.in/html/Training/Market%20study/UAE_Final_Report.pdf***

Maximum Residue Levels[24]

The CODEX Codex Alimentarius Commission which is part of the Joint FAO/WHO Food Standards Programme[25] states that Codex MRLs and EMRLs are established for raw agricultural commodities, However, where it is considered necessary for consumer protection and facilitation of trade, MRLs and EMRLs are also established for certain processed foods on a case-by-case basis, taking into consideration information on the influence of processing on residues. The following MRLs have been collated as per the identified food products for the purpose of this study. As MRLs are also dependent on the pesticides dosage used at the point of cultivation of a particular raw material, hence the MRL for those individual raw materials are also captured in the following table.

Product Type	Pesticide Type	Maximum Limit permissible
Milled Cereal Products	Methyl Bromide	0.01 mg/Kg
		1 mg/kg
Biscuit	Methyl Bromide	0.01 mg/Kg
Apple Juice	Propargite	0.2 mg/Kg
	Diphenylamine	0.5 mg/Kg
Orange Juice	Propargite	0.3 mg/Kg
	2-Phenylphenol	0.5 mg/Kg
Tomato Juice	Malathion	0.01 mg/Kg
	Piperonyl Butoxide	0.3 mg/Kg
	Carbaryl	3 mg/Kg
Potato	Oxydemeton-Methyl	0.01 mg/Kg
	Deltamethrin	0.01 mg/Kg
	Spinozad	0.01 mg/Kg
	Abamectin	0.01 mg/Kg
	Diazinon	0.01 mg/Kg
	Cyfluthrin/beta-cyfluthrin	0.01 mg/Kg
	Chlorpyrifos-Methyl	0.01 mg/Kg
	Novaluron	0.01 mg/Kg
	Dimethenamid-P	0.01 mg/Kg
	Mandipropamid	0.01 mg/Kg
	Famoxadone	0.02 mg/Kg
	Methomyl	0.02 mg/Kg
	Methidathion	0.02 mg/Kg
	Fipronil	0.02 mg/Kg
	Benalaxyl	0.02 mg/Kg
	Pyraclostrobin	0.02 mg/Kg
	Zoxamide	0.02 mg/Kg

[24] ***http://www.codexalimentarius.net/pestres/data/commodities/details.html?d-16497-o=2&id=84&d-16497-s=1***
[25] ***http://www.fao.org/waicent/faostat/Pest-Residue/pest-e.htm#E9E5***

	Indoxacarb	0.02 mg/Kg
	Thiacloprid	0.02 mg/Kg
	Trifloxystrobin	0.02 mg/Kg
	Metaflumizone	0.02 mg/Kg
	Propargite	0.03 mg/Kg
	Fluxapyroxad	0.03 mg/Kg
	Fluopyram	0.03 mg/Kg
	Methiocarb	0.05 mg/Kg
	Phosmet	0.05 mg/Kg
	Teflubenzuron	0.05 mg/Kg
	Fenpyroximate	0.05 mg/Kg
	Ametoctradin	0.05 mg/Kg
	Permethrin	0.05 mg/Kg
	Methamidophos	0.05 mg/Kg
	Pyrimethanil	0.05 mg/Kg
	Ethoprophos	0.05 mg/Kg
	Cyantraniliprole	0.05 mg/Kg
	Metalaxyl	0.05 mg/Kg
	Captan	0.05 mg/Kg
	Endosulfan	0.05 mg/Kg
	Penthiopyrad	0.05 mg/Kg
	Dimethipin	0.05 mg/Kg
	Azinphos-Methyl	0.05 mg/Kg
	Dimethomorph	0.05 mg/Kg
	Parathion-Methyl	0.05 mg/Kg
	Dimethoate	0.05 mg/Kg
	Diquat	0.1 mg/Kg
	Folpet	0.1 mg/Kg
	Oxamyl	0.1 mg/Kg
	Glufosinate-Ammonium	0.1 mg/Kg
	Dichlofluanid	0.1 mg/Kg
	Bentazone	0.1 mg/Kg
	Tolclofos-Methyl	0.2 mg/Kg
	2,4-D	0.2 mg/Kg
	Dithiocarbamates	0.2 mg/Kg
	Phorate	0.3 mg/Kg
	Propamocarb	0.3 mg/Kg
	Clethodim	0.5 mg/Kg
	Spirotetramate	0.8 mg/Kg
	Chlorpyrifos	2 mg/Kg
	Cycloxydim	3 mg/Kg
	Difenoconazole	4 mg/Kg
	Fludioxonil	5 mg/Kg
	Imazalil	5 mg/Kg
	Azoxystrobin	7 mg/Kg
	Thiabendazole	15 mg/Kg
	Tecnazene	20 mg/Kg
	Chlorpropham	30 mg/Kg
	Maleic Hydrazide	50 mg/Kg

Dried Vegetables	Hydrogen Phosphide	0.01 mg/Kg
Fruits and Vegetables	Chlordane	0.02 mg/Kg
Milled cereal products	Methyl Bromide	0.01 mg/Kg
Tomato Paste	Carbaryl	10 mg/Kg
Maize	Paraquat	0.05 mg/Kg
	Penthiopyrad	0.05 mg/Kg
	Phorate	0.05 mg/Kg
	Sulfuryl fluoride	0.1 mg/Kg
	Propargite	0.2 mg/Kg
Spices	Hydrogen Phosphide	0.01 mg/Kg
	Permethrin	0.05 mg/Kg
	Vinclozolin	0.05 mg/Kg
	Disulfoton	0.05 mg/Kg
	Dichlorvos	0.1 mg/Kg
	Methamidophos	0.1 mg/Kg
	Acephate	0.2 mg/Kg
	Azinphos-Methyl	0.5 mg/Kg
	Bromide Ion	400 mg/Kg
Pulses	Clothianidin	0.02 mg/Kg
	Thiamethoxam	0.04 mg/Kg
	Cypermethrins (including alpha- and zeta- cypermethrin)	0.05 mg/Kg
	Aldrin and Dieldrin	0.05 mg/Kg
	Cyhalothrin (includes lambda-cyhalothrin)	0.05 mg/Kg
	Azoxystrobin	0.07 mg/Kg
	Pyrethrins	0.1 mg/Kg
	Pirimicarb	0.2 mg/Kg
	Piperonyl Butoxide	0.2 mg/Kg
	Penthiopyrad	0.3 mg/Kg
	Saflufenacil	0.3 mg/Kg
	Bifenthrin	0.3 mg/Kg
	Paraquat	0.5 mg/Kg
	Prothioconazole	1 mg/Kg
	Flubendiamide	1 mg/Kg
	Deltamethrin	1 mg/Kg
	Chlorothalonil	1 mg/Kg
	Spirotetramate	2 mg/Kg
	Imidacloprid	2 mg/Kg
	Boscalid	3 mg/Kg

Bacterial contamination/unhygienic factors

Contamination is food products may take place at given point in the food chain. They may be understood in the following manner:

1. Post harvest storage
2. During processing
3. Post processing storage
4. Transportation
5. Inappropriate storage condition at the final retail level.

As seen earlier, around 77 per cent of processed Indian food products has been under the scanner due to issues in adulteration and contamination.

In India, Ministry of Food Processing Industries, Government of India promotes The Scheme of Implementation of HACCP/ ISO 22000/ ISO 9000/ GHP/ GMP/ Quality Safety Management Systems with the following pupose:

1. To motivate the food processing industry for adoption of food safety and quality assurance mechanisms such as TQM including ISO 9000, ISO 22000, HACCP, GMP, GHP.
2. To enable adherence to stringent quality and hygiene norms and thereby protect consumer health.
3. To prepare industry to face global competition in post WTO Regime. · To enhance product acceptance by overseas buyers.
4. To keep Indian industry technologically abreast of international best practices.

Increasingly, it has been observed that importing countries are demanding for WHO-GMP certification instead of ISO9000/HACCP. **Good manufacturing practice (GMP)** is part of a quality system covering the manufacture and testing of active pharmaceutical ingredients, diagnostics, foods, pharmaceutical products and medical devices.

GMP certification confirms the products identity, composition, quality, purity and strength which they represent in the market. Under it, there is a set of guidelines that offer a system of procedures and documentation by which the confirmation of the products are given. The benefits of WHO-GMP certifications are multifold. They are listed below:

1. Reduced duplication of inspections
2. Enhanced market access
3. Export facilitation
4. Cost savings
5. Customers, employees, stockholders, regulators and competitors develop sustainable respect for an organization which demonstrates its proactive commitment to food safety.

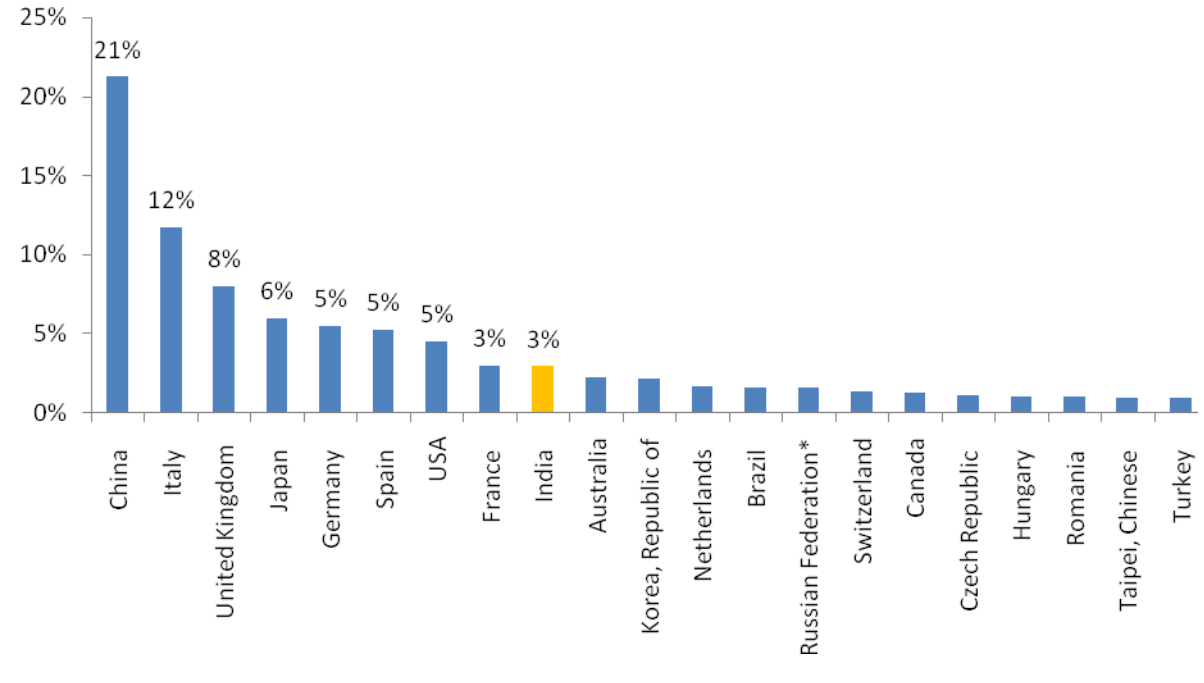
In the event of multiple certification system available, a newer certification system ISO 22000 has been formulated which combines the benefits of ISO and GMP in food management safety. It is a general

derivative of ISO 9001. Undertaking an analysis of the ISO 9000 and ISO 22000 certifications in the global scenario, we can observe the following[26]:

1. Analyzing the trend for number of ISO 9001 certifications for over 190 countries during the period of 1993-2013, it can be observed that India is in the 9th position in terms of absolute number. Overall India has 3 per cent of certifications held globally. China is the leading country with 21 per cent of certifications.

SL No	Name of countries	ISO 9001 Certifications
1	China	2716686
2	Italy	1502129
3	United Kingdom	1019817
4	Japan	763357
5	Germany	698339
6	Spain	669472
7	USA	581204
8	France	386159
9	India	374892
10	Australia	286468

Status of ISO 9000 certifications during the period 1999-2013

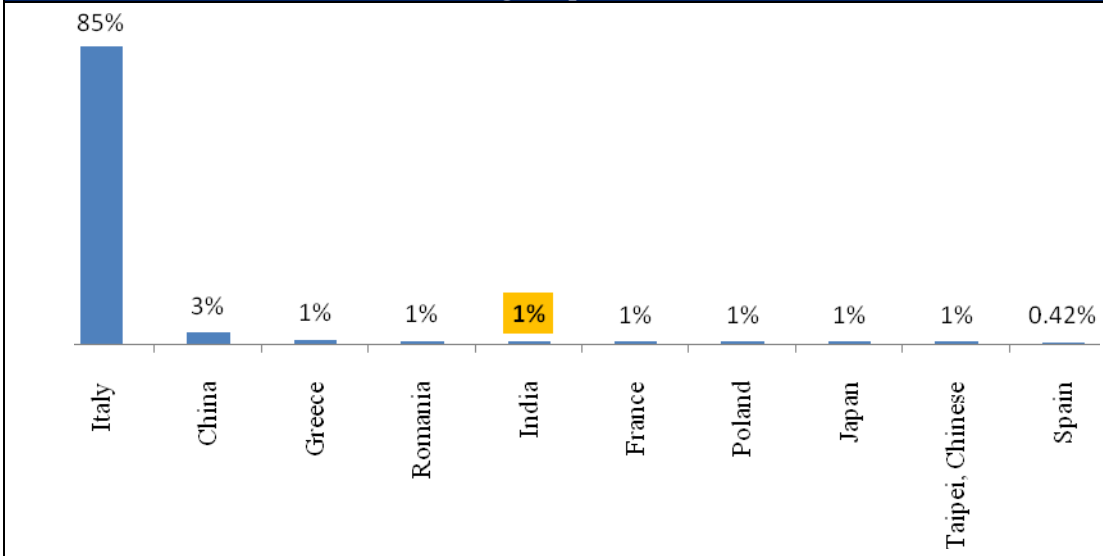


[26] ***http://www.iso.org/iso/iso-survey***

2. Analyzing the trend for number of ISO 22000 certifications for over 157 countries during the period of 1993-2013, it can be observed that India is in the 5th position in terms of absolute number. Overall India has 1 per cent of certifications held globally. Italy is the leading country with 85 per cent of certifications.

SL No	Name of countries	ISO 9001 Certifications
1	Italy	423959
2	China	15975
3	Greece	5558
4	Romania	3941
5	India	3682
6	France	3380
7	Poland	3296
8	Japan	3088
9	Taipei, Chinese	3050
10	Spain	2068

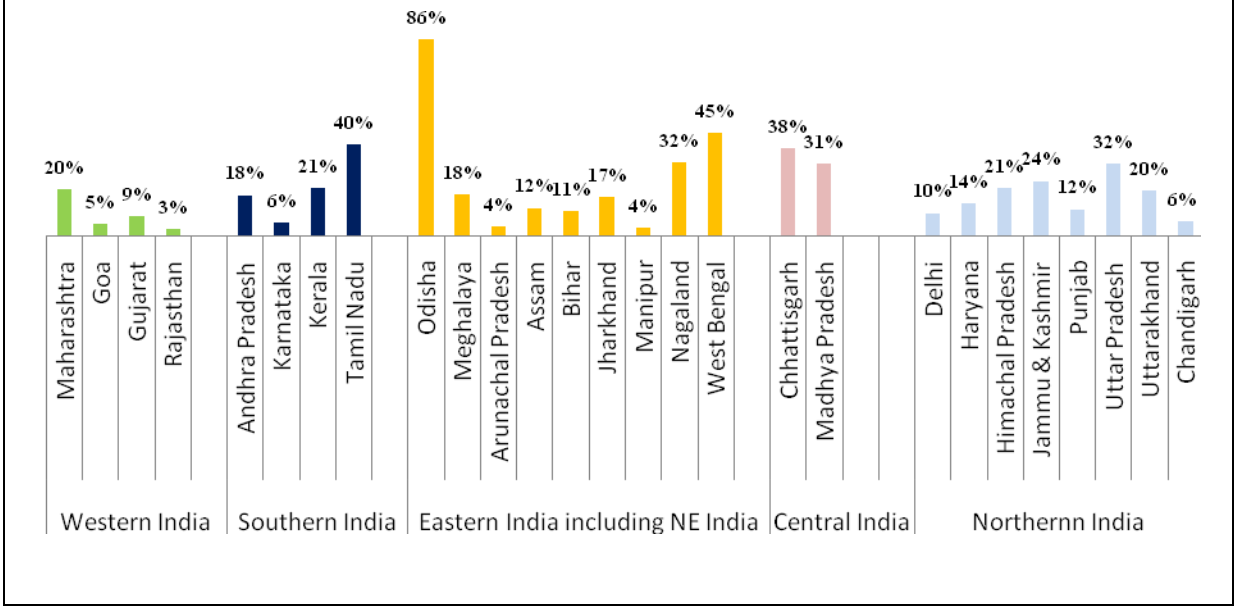
Status of ISO 9000 certifications during the period 1999-2013



The following table provides us with overall state wise trend for number of defects founds in terms of contaminations in food products[27]:

[27] ***http://www.fssai.gov.in/FoodSafetyinStates.aspx***

State wise Trend found for food contamination in India



The states of Uttar Pradesh, Maharashtra and Madhya Pradesh have the highest incidences of defective food contamination in India at 35 per cent, 12 per cent and 12 per cent respectively.

Chapter 10 GSP And Other Preferential Duties

While analyzing, it has been found that there are various arrangements made by the developed countries which allows developing countries' exporters to pay less or no duties on their exports to the developed countries. These arrangement known as a Generalized System of Preferences (GSP) is a preferential tariff system extended by developed countries to developing countries. It involves reduced MFN Tariffs or duty-free entry of eligible products exported by beneficiary countries to the markets of donor countries.

Benefits of GSP:

- Indian exporters benefit indirectly - through the benefit that accrues to the importer by way of reduced tariff or duty free entry of eligible Indian products
- Reduction or removal of import duty on an Indian product makes it more competitive to the importer - other things (e.g. quality) being equal.
- This tariff preference helps new exporters to penetrate a market and established exporters to increase their market share and to improve upon the profit margins.

GSP is presently extended by 29 developed countries:

Australia	**Republic of Bulgaria**	*** EU Member States**	
Canada	Republic of Hungary	Austria	Italy
Czech Republic	Republic of Poland	Belgium	Luxembourg
European Union*	Russian Federation	Denmark	Netherlands
Japan	Slovakia	Finland	Portugal
New Zealand	Switzerland	France	Spain
Norway Republic of Belarus	United States of America	Germany	Sweden
		Greece	United Kingdom
		Ireland	

In addition, it is noted that Kazakhstan, Kyrgyzstan, Lithuania and Ukraine also allowing preferential tariff treatment to select Indian goods. Also, there are many countries that do not extend the GSP but offer various other types of concessions to improve market access for developing and less developed countries.

As a part of analysis, product-wise duties analysis has been done by the team. Following are the GSP and other preferential duties applicable for the export of identified value added/processed products in the target markets:

Biscuits: As mentioned in the earlier chapters that the United States of America leads in terms of import followed by EU countries, India's share in word trade of biscuits is only 1.05%. Following are the GSP and other preferential duties applicable for the export of this product:

S. No	**Target Countries**	**Extended GSP to India**	**Other Preferential Duty**
1	United States of America	0%	

2	United Kingdom	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
3	France	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
4	Germany	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
5	Canada		4.00%
6	Belgium	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
7	Netherlands	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
8	Italy	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
9	Poland	5.50 % + EA (1) MAX 24.2 +ADSZ (1)	
10	Turkey		5.50%
11	Spain	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	
12	Austria	5.50 % + EA(1) MAX 20.70 % +ADFM(1)	

It has been observed that all the potential trade partners extend one or other kind of preference to India. Amongst all the target countries, India is offered the least tariff of 0% by USA followed by Canada which extends a preferential duty of 4%. Turkey extends a preferential duty of 5.50%. Then come the EU countries which extend the same GSP of 5.50 % + EA(1) MAX 20.70 % +ADFM(1) to India followed by Poland with extended GSP of 5.50 % + EA (1) MAX 24.2 +ADSZ(1).

Since the EU comprises of many countries which extend the same GSP to India, a further reduction in tariffs can be taken up with these countries keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in biscuit exports from India to the EU.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product is shown in table below:

Target Market	Name of Competing Countries						
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	**United States of America**	**Canada**	**Poland**	**Turkey**	**Mexico**	**India**
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0%	9.00 % + EA(1) MAX 24.20 % +ADSZ(1)	9.00 % + EA(1) MAX 24.20 % +ADSZ(1)	5.5 % + EA (1) MAX 24.2 +ADSZ (1)	5.50%	9.00 % + EA(1) MAX 24.20 % +ADSZ(1)	5.50 % + EA(1) MAX 20.70 % +ADFM(1)
USA	30%	0%	30%	30%	30%	30%	0%
Canada	2%	0%	0%	0%	0%	0%	4%
Turkey	9 (3)	9 (3)	9 (3)	9 (3)	9 (3)	9 (3)	5.50%

From the above table, it is evident that EU countries enjoy a tariff of 0% for export of the product within this group of countries, followed by Turkey (5.50%) and India (5.50 % + EA(1) MAX 20.70 % +ADFM(1)). The imports of this product into the EU from USA, Canada and Mexico are subjected to much higher tariffs of 9.00 % + EA(1) MAX 24.20 % +ADSZ(1) when compared to tariffs extended to India. However, the government may further negotiate with EU to reduce tariff levels offered to India as Turkey is one country other than EU with lower offered tariffs as compared to India. It can also be seen that exporting the product to Turkey attracts least tariffs for India when compared with tariffs extended by Turkey to other competing nations.

Dehydrated Onions and Garlic

India is the market leader in this segment. In 2014, India's market share for dehydrated onions was 37 %. The total market was US$ 293 million. Following are the GSP and other preferential duties applicable for the export:

S. No	Target Market	Extended GSP to India	Other Preferential Duty
1	**Vietnam**		
A	Onion		15.00%
B	Garlic		10.00%
2	**USA**		
A	Onion		21.30%
B	Garlic		29.80%
3	**Germany**		
A	Onion	0%	
B	Garlic	0%	
4	**Netherlands**		
A	Onion	0%	
B	Garlic	0%	
5	**France**		
A	Onion	0%	
B	Garlic	0%	
6	**Canada**		
A	Onion		6%
B	Garlic		6%
7	**United Kingdom**		
A	Onion	0%	
B	Garlic	0%	
8	**Italy**		
A	Onion	0%	
B	Garlic	0%	

It is reflected from the above table that amongst all the target countries, India is offered the least tariff of 0% by EU nations followed by Canada which extends a preferential duty of 6% against the Vietnam which extends a preferential duty of 15% in dehydrated onion and 29.80 % in dehydrated Garlic. Since the USA and Canada comprises of good market for dehydrated products, a further reduction in tariffs may be taken up with these countries keeping EU tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in biscuit exports from India to the EU.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product is shown in table below

Target Market	Name of Competing Countries						
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	**United States of America**	**Canada**	**Poland**	**Egypt**	**Mexico**	**India**
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0%	3.00%	12.80 % along with Non preferential tariff quota - 10.00 %	12.80 % along with Non preferential tariff quota - 10.00 %	12.80 % along with Non preferential tariff quota - 10.00 %	12.80 % along with Non preferential tariff quota - 10.00 %	5.50 % + EA(1) MAX 20.70 % +ADFM(1)
USA	35%	0%	0%	35%	35%	0%	Dried Onion-21.3% Dried Garlic-29.80%
Vietnam	30%	30%	30%	30%	30%	30%	Dried Onion-15% Dried Garlic-10%

From the above table, it is evident that EU countries enjoy a tariff of 0% for export of the product within this group of countries, followed by USA (3%). The imports of this product into EU from Canada, Poland, Egypt and Mexico are subjected to much higher tariffs of 12.80 % along with imposed non preferential tariff quota of 10.00 %. The tariff expended to India is 5.50 % + EA(1) MAX 20.70 % +ADFM(1).

The import of dehydrated onion and garlic into USA from other competing countries like EU, Poland is subjected to a tarrif rate of 35% against the 0% tariff being paid by the Canada, Egypt and Mexico. The reduction has been observed due to FTA conducted between the countries ***(North American Free Trade Agreement: Goods of Canada, under the terms of general note 12 to this schedule & Goods of Mexico, under the terms of*** *general note 12 to this schedule & GSP*). However, when we compare the advantage given to India, India is subjected to pay 21.3 % tariff on import of dried onion and 29.8 % on import of garlic in to USA which is much higher than the rate extended to other countries by USA.

Fruit Juices & Concentration

India is ranked 2nd in Fruits and Vegetables production in the world. The total value of this market is around US$ 1.6 billion out of which India has a meager 0.38% of the market. Amongst the total exported value from India, the product comprises only about 1%. In term of targeted market USA stood at No 1 position followed by again the EU countries like Germany, Netherlands etc. Following are the GSP and other preferential duties applicable for the export in the targeted market:

S. No	Target Market	Extended GSP to India	Other Preferential Duty
1	**United States of America**		
A	Lemon Juice	0.00%	
B	Pineapple Juice	0.00%	
C	Grapes Juices	0.00%	
D	Apple Juice	0.00%	
E	Tomato Juice	0.00%	
2	**Germany**		
A	Lemon Juice	10.90%	
B	Pineapple Juice	11.70%	
C	Grapes Juices	18.90 % + 27.00 EUR / hl	
D	Apple Juice	14.50%	
E	Tomato Juice	12.50 %	
3	**Netherlands**		
A	Lemon Juice	10.90%	
B	Pineapple Juice	11.70%	
C	Grapes Juices	18.90 % + 27.00 EUR / hl	
D	Apple Juice	14.50%	
E	Tomato Juice	12.50 %	
4	**France**		
A	Lemon Juice	10.90%	
B	Pineapple Juice	11.70%	
C	Grapes Juices	18.90 % + 27.00 EUR / hl	
D	Apple Juice	14.50%	
E	Tomato Juice	12.50 %	
5	**Belgium**		
A	Lemon Juice	10.90%	
B	Pineapple Juice	11.70%	
C	Grapes Juices	18.90 % + 27.00 EUR / hl	
D	Apple Juice	14.50%	
E	Tomato Juice	12.50 %	

6	**United Kingdom**		
A	Lemon Juice	10.90%	
B	Pineapple Juice	11.70%	
C	Grapes Juices	18.90 % + 27.00 EUR / hl	
D	Apple Juice	14.50%	
E	Tomato Juice	12.50 %	
7	**Canada**		
A	Lemon Juice		0.00%
B	Pineapple Juice		0.00%
C	Grapes Juices		9.50%
D	Apple Juice		8.50%
E	Tomato Juice		12.50%

Note - Major exporting fruits have been taken into consideration

It is reflected from the above table that amongst all the target countries, India is offered the least tariff of 0% by USA followed by Canada and EU Nations. Since the EU comprises of good market of Fruit Juices & Concentration, a further discussion on tariffs may be taken up with these countries keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in this product category exports from India to the EU.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product is shown in table below:

Target Market	Name of Competing Countries					
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	United States of America	Canada	Poland	Thailand	India
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0%	Lemon Juice-14.4% Pineapple Juice-15.2% Grapes Juices-12.0% Apple Juice-18% Tomato Juice-16%	Lemon Juice-14.4% Pineapple Juice-15.2% Grapes Juices-12.0% Apple Juice-18% Tomato Juice-16%	Lemon Juice-14.4% Pineapple Juice-15.2% Grapes Juices-12.0% Apple Juice-18% Tomato Juice-16%	Lemon Juice-14.4% Pineapple Juice-15.2% Grapes Juices-12.0% Apple Juice-18% Tomato Juice-16%	Lemon Juice-10.9% Pineapple Juice-11.7% Grapes Juices-18.90 % + 27.00 EUR / hl Apple Juice-14.5% Tomato Juice-12.5%
USA	Lemon Juice-1.8$/KG Pineapple Juice-4.2$/L Grapes Juices-4.4$/L Apple Juice-0 $/L Tomato Juice-.4$/L	0%	0%	Lemon Juice-1.8$/KG Pineapple Juice-4.2$/L Grapes Juices-4.4$/L Apple Juice-0 $/L Tomato Juice-.4$/L	0%	0%

Canada	Lemon Juice-0% Pineapple Juice-0% Grapes Juices-9.5% Apple Juice-8.5% Tomato Juice-12.5%	Lemon Juice-0% Pineapple Juice-0% Grapes Juices-0% Apple Juice-0% Tomato Juice-0%	Lemon Juice-0% Pineapple Juice-0% Grapes Juices-0% Apple Juice-0% Tomato Juice-0%	Lemon Juice-0% Pineapple Juice-0% Grapes Juices-9.5% Apple Juice-8.5% Tomato Juice-12.5%	Lemon Juice-0% Pineapple Juice-0% Grapes Juices-9.5% Apple Juice-8.5% Tomato Juice-12.5%	Lemon Juice-0% Pineapple Juice-0% Grapes Juices-9.5% Apple Juice-8.5% Tomato Juice-12.5%

From the above table, it is evident that EU countries enjoy a tariff of 0% for export of the product within this group of countries, followed by India (**Lemon Juice-10.9%, Pineapple Juice-11.7%,Grapes Juices-18.90 % + 27.00 EUR / hl, Apple Juice-14.5% & Tomato Juice-12.5%)** and USA, Canada, Thailand & Poland with tariff rates being Lemon Juice-14.4%, Pineapple Juice-15.2%, Grapes Juices-12.0%, Apple Juice-18% & Tomato Juice-16%.

The import of fresh Fruits Juices into USA from other competing countries like EU, Poland is subjected to a tariff rate of Lemon Juice-1.8$/KG, Pineapple Juice-4.2$/L, Grapes Juices-4.4$/L, Apple Juice- 0 $/L, Tomato Juice-.4$/L against the 0% tariff being paid by Canada, Thailand and India. The reduction has been observed due to FTA done between the countries (***North American Free Trade Agreement: Goods of Canada, under the terms of general note 12 to this schedule & Goods of Thailand, under the terms of general note 12 to this schedule & GSP).***

Canada also offers much lower tariff rate to USA due to FTA between the nations. However, the tariffs extended to other nations are much higher than the tariffs extended to developed nations. Therefore, a further reduction on the current tariff may be taken as an issue in the RTA/FTA.

Wine of Fresh Grapes

The segment has witnessed a CAGR of around 4% during the period 2010-2014. The leading countries involved in the exports of this product are USA, UK, Germany, Japan, Canada, Belgium and Netherlands. India contributes only 0.02% of the total exports market.

Further, it may be noted that most of the target countries provide good conditions for exporting the identified products. It can be shown from the below table that all the targeted countries allow duty-free entry to identified products. Following are the GSP and other preferential duties applicable for the export of this product:

S. No	Name of Country	Extended GSP to India	Other Preferential Duties
1	United States of America	0%	
2	United Kingdom	0%	
3	Germany	0%	
4	Canada	0%	
5	Japan		145.60 yen/l
6	Belgium	0%	
7	Netherland	0%	

It is reflected from the above table that all the target countries offer 0% tariff rate for the import of Wine of Fresh Grapes expect Japan which extends a tariff rate of 145.60 yen/l. However, other countries which are exporting the wine to Japan are also on higher side. The same can be seen from the below table:

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product is shown in table below:

Target Market	Name of Competing Countries						
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	**United States of America**	**Chile**	**Poland**	**Newlands**	**India**	**Australia**
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0%	32.00 EUR / hl	32.00 EUR / hl	32.00 EUR / hl	32.00 EUR / hl	0%	32.00 EUR / hl
USA	19.8$/liter 2/	0%	0%	19.8$/liter 2/	19.8$/liter 2/	0%	19.8$/liter 2/
Canada	0%	0%	0%	0%	0%	0%	0%
Japan	201.60 yen/l	201.60 yen/l	44.8yen/l	201.60 yen/l	201.60 yen/l	145.60 yen/l	136.50yen/l

Dried Potato products

The product types considered in this category are pellets, powders and flakes. India's position in this category is 14th globally. In terms of export performance, India controls only 2% of the total trade. Following are the GSP and other preferential duties applicable for the export of this product:

S. No	Target Market	Extended GSP to India	Other Preferential Duties
1	United Kingdom	8.50%	
2	Italy	8.50%	
3	United States of America	0%	
4	France	8.50%	
5	Belgium	8.50%	
6	Japan		7.40%
7	Spain	8.50%	
8	Germany	8.50%	

It may be noted from the above table that India is offered the least tariff of 0% by USA followed by Japan which extends a preferential duty of 7.4% and the EU Nations (8.50%). Since the EU comprises of large market for dehydrated and dried products, a further reduction in tariffs may be taken up with these countries keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth to this category of product exports from India to the EU.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product is shown in table below:

Target Market	Name of Competing Countries						
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	United States of America	Poland	Egypt	Canada	UAE	India
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0.0%	12.2%	12.2%	12.2%	12.2%	12.2%	0%
USA	0.0%	0%	0.0%	0.0%	0%	0.0%	0%
Japan	16%	16%	16%	16%	16%	16%	7.40%

It may be seen from the above table that India is offered least tariff of 0% for export of the product within the EU and USA against the rate being imposed on the other countries which are on the higher side. Unlike EU, the import of dried potato products into USA from countries like Poland, Egypt, Canada, UAE and India attracts a tariff rate of 0%.

The import of dried potato into Japan from other competing countries like EU, USA, Poland, Egypt, Canada, UAE is subjected to a tariff of 16% against the lower rate being offered to India (7.4%).

Frozen Peas and Vegetables

India's position for export in this sector is 24th. The current export destinations for the frozen pea category are provided below. It account for 26 per cent of the total frozen vegetable exports from India. Following are the GSP and other preferential duties applicable for the export of this product:

Sl No	Target Market	Extended GSP to India	Other Preferential Duties
1	UAE		5%
2	United States of America	0%	
3	Canada	9.50%	
4	Egypt		5%
5	United Kingdom	10.90%	
6	Qutar		5%
7	Oman		5%
8	Bahrian		5%

It may be noted from the above table that India is offered the least tariff of 0% by USA followed by UAE, Egypt, Qutar, Oman and Bahrain which extend a preferential duty of 5%. Canada (9.50%) & EU Nations (10.90%) tariffs are on the higher side Since UAE comprises of a large market for frozen vegetable products, reduction in tariffs may be taken up with keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in product category exports from India to the UAE.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product category is shown in the table below:

Target Market	Name of Competing Countries							
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	United States of America	Japan	Egypt	Canada	UAE	India	Kuwait
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0.0%	14.4%	14.4%	14.4%	14.4%	14.4%	8.5%	14.4%
USA	1$/kg	0%	1$/kg	1$/kg	0%	1$/kg	0%	1$/kg
Japan	10%	10%	10%	10%	10%	10%	4.60%	10%
UAE	5%	5%	5%	5%	5%	5%	5%	5%

It may be seen from the above table, India is offered least tariff rates for export of the product within the EU, USA and Japan against the rates being imposed on other countries which are on higher side.

Jams, Jellies and Marmalades

In this category India controls 4% of the total trade. In terms of CAGR, however, India has 15% in exports. Based on the GSP and other preferential duties analysis it has been found that EU countries hold the biggest market followed by USA. Following are the GSP and other preferential duties applicable for the export of this product:

S. No.	Target Market	GSP
1	**Germany**	
A	Citrus Fruits	16.50 % + 23.00 EUR / 100 kg
B	Tropical Fruits-Mango, Guava, Pineapple	5.20%
2	France	
A	**Citrus Fruits**	16.50 % + 23.00 EUR / 100 kg
B	Tropical Fruits-Mango, Guava, Pineapple	5.20%
3	**USA**	
A	Citrus Fruits	0.00%
B	Tropical Fruits-Mango, Guava, Pineapple	
4	**United Kingdom**	
A	Citrus Fruits	16.50 % + 23.00 EUR / 100 kg
B	Tropical Fruits-Mango, Guava, Pineapple	5.20%
5	**Netherland**	
A	Citrus Fruits	16.50 % + 23.00 EUR / 100 kg
B	Tropical Fruits-Mango, Guava, Pineapple	5.20%
6	**Belgium**	
A	Citrus Fruits	16.50 % + 23.00 EUR / 100 kg
B	Tropical Fruits-Mango, Guava, Pineapple	5.20%
7	Italy	
A	**Citrus Fruits**	16.50 % + 23.00 EUR / 100 kg
B	Tropical Fruits-Mango, Guava, Pineapple	5.20%

It may be seen from the above table that India is offered the least tariff of 0% by USA followed by EU which extends a preferential duty of 16.50 % + 23.00 EUR / 100 kg on Citrus Fruits juice and 5.20% on Tropical Fruits-Mango, Guava, Pineapple juice. Since the EU countries comprises of large market for this product category, reduction in tariffs may be taken up with these countries keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in fruit juice exports from India to the EU.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product category is shown in table below:

Target Market	Name of Competing Countries				
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	United States of America	Turkey	Chile	India
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0.0%	Citrus Fruits-20.00 % + 23.00 EUR / 100 kg Tropical Fruits-Mango, Guava, Pineaaple-15%	Citrus Fruits-20.00 % + 23.00 EUR / 100 kg Tropical Fruits-Mango, Guava, Pineaaple-15%	Citrus Fruits-20.00 % + 23.00 EUR / 100 kg Tropical Fruits-Mango, Guava, Pineaaple-15%	Citrus Fruits-16.50 % + 23.00 EUR / 100 kg Tropical Fruits-Mango, Guava, Pineaaple-5.20%
USA	Citrus Fruits-11.2% Tropical Fruits-Mango, Guava, Pineaaple-1.3%	0%	Citrus Fruits-11.2% Tropical Fruits-Mango, Guava, Pineaaple-1.3%	0.0%	0%
Japan	Citrus Fruits-28% Tropical Fruits-Mango, Guava, Pineaaple-20%	Citrus Fruits-28% Tropical Fruits-Mango, Guava, Pineaaple-20%	Citrus Fruits-28% Tropical Fruits-Mango, Guava, Pineaaple-20%	Citrus Fruits-7.4% Tropical Fruits-Mango, Guava, Pineaaple-5.3%	Citrus Fruits-9.2% Tropical Fruits-Mango, Guava, Pineaaple-6.5%

It may be seen from the above table that India is offered tariff rate of 16.50 % + 23.00 EUR / 100 kg for export of the product within the EU and 0% within USA against the rate being imposed on the other countries which is on higher side. Unlike EU and USA, the import of Jam, Jelly products into Japan from other competing countries like USA, Turkey, and Chile, the tariff rate being offered is Citrus Fruits-28%

Tropical Fruits-Mango, Guava, Pineaaple-20% against the rate offered to India which is Citrus Fruits-9.2%, Tropical Fruits-Mango, Guava, Pineaaple-6.5%

Since the EU countries and USA comprise of large markets for this product category, reduction in tariffs may be taken up with these countries in various RTAs/FTAs to give boost to Indian Export Market.

Confectionary (Sugar Based)

India's position in this category is 34th. In terms of share in global market, India shares only 1%. Based on the GSP and other preferential duties analysis, it may be noted that USA holds the biggest market followed by EU countries. Following are the GSP and other preferential duties applicable for the export of this product:

Sl No	Target Market	Extended GSP to India	MSN
1	United States of America	Free	
2	Germany	9.30%	
3	United Kingdom	9.30%	
4	France	9.30%	
5	Canada		9.50%
6	Netherlands	9.30%	
7	Belgium	9.30%	

As It is reflected from the above table that India is offered the least tariff of 0% by USA followed by EU which extends a preferential duty of 9.5% on sugar based confectionary.

The comparison of tariffs extended to India vis-à-vis to other countries for this particular product is shown in table below:

Target Market	Name of Competing Countries						
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	United States of America	Turkey	Poland	China	Canada	India
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0.0%	13.4% along with 35 % of Non Preferential Duties	13.4% along with 35 % of Non Preferential Duties	13.4% along with 35 % of Non Preferential Duties	Citrus Fruits-16.50 % + 23.00 EUR / 100 kg Tropical Fruits-Mango, Guava, Pineaaple-5.20%	Citrus Fruits-16.50 % + 23.00 EUR / 100 kg Tropical Fruits-Mango, Guava, Pineaaple-5.20%	9.30%
USA	4.0%	0%	4.0%	4.0%	4%	0%	0%
Canada	9.5%	9.5%	9.5%	9.5%	9.5%	0%	9.50%

It may be seen from the above table that India is offered least tariff rate on sugar based confectionary for export of the product within the EU and 0% within USA against the rate being imposed on other countries which is on higher side. Unlike EU and USA, for the import of same product into Canada from other competing countries like USA, Turkey, Poland, China and Chile, the tariff rate being imposed is 9.50% for all the countries.

Sauces and Condiments

India's position in this category is 45th globally. India accounts for 0.36% of the total global exports. Based on the GSP and other preferential duties analysis, it may be noted that USA holds the biggest market followed by EU countries. Following are the GSP and other preferential duties applicable for the export of this product:

S. No	Name of Countries	Extended GSP to India
1	United States of America	0%
2	United Kingdom	6.70%
3	France	6.70%
4	Germany	6.70%
5	Canada	6.70%
6	Netherland	6.70%
7	Japan	3.30%
8	Belgium	6.70%

It may be reflected from the above table that India is offered the least tariff of 0% by USA followed by EU which extends a preferential duty of 6.7% on Sauces and Condiments. Since the EU countries comprises of good market, reduction in tariffs may be taken up with these countries keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in fruit juice exports from India to the EU.

Target Market	Name of Competing Countries						
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	United States of America	Thailand	Poland	China	Canada	India
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0.0%	10.2%	10.2%	10.2%	10.2%	10.2%	6.70%
USA	7.5%	0%	7.5%	7.5%	8%	0%	0%
Canada	9.5%	9.5%	9.5%	9.5%	9.5%	0%	6.70%

Tapioca and Maize Starch

India's position in this category is 7th. India controls 34 per cent of the total global trade in starch Following are the GSP and other preferential duties applicable for the export of this product:

Sl No	Target Market	Extended GSP to India
1	United States of America	0%
2	France	2.90 % + 15.10 EUR / 100 kg
3	Japan	5.20%
4	Canada	5.00%
5	Netherland	2.90 % + 15.10 EUR / 100 kg

It may be reflected from the above table that India is offered the least tariff of 0% by USA followed by EU and Canada which extends a preferential duty of 2.90 % + 15.10 EUR / 100 kg and 5.0 % respectively on Tapioca and maize starch. Since the EU countries comprises of good market, reduction in tariffs may be taken up with these countries keeping USA tariffs as benchmark for negotiation in various RTAs/FTAs to give further growth in fruit juice exports from India to the EU.

Target Market	Name of Competing Countries				
	EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	China	Thailand	India	Australia
EU Union United Kingdom, France, Germany ,Belgium, Netherlands, Italy, Spain, Austria etc	0.0%	6.40 % + 15.10 EUR / 100 kg	6.40 % + 15.10 EUR / 100 kg	2.90 % + 15.10 EUR / 100 kg	6.40 % + 15.10 EUR / 100 kg
USA	0.8¢/kg	0.8¢/kg	0.8¢/kg	0%	0.8¢/kg
Canada	0.0%	0.0%	0.0%	0.0%	0.0%
Japan	9.60%	9.60%	0%	5.20%	6.40%

Conclusion

India has embarked on a process of economic reform and progressive integration with the global economy that aims to put it on a path of rapid and sustained growth. However, India's trade regime and regulatory environment remains comparatively restrictive. India still maintains substantial tariff and non-tariff barriers that hinder trade with the EU and major exporting countries like USA, Canada and China. In addition to tariff barriers to imports, India also imposes a number of non-tariff barriers in the form of quantitative restrictions, import licensing, mandatory testing and certification for a large number of products, as well as complicated and lengthy customs procedures.

India enjoys trade preferences with the EU and USA under the Generalized Scheme of Preferences. The same can be proposed for the other growing targeted market like China, Australia, and Canada etc to help India to penetrate new market and established their market share and to improve upon the profit margins.

Based on the imported value of the identified products, following are the countries which have been identified for future expansion of exports from India:

1. United States of America
2. United Kingdom
3. France
4. Germany
5. Canada
6. Belgium
7. Netherlands
8. Italy
9. Austria
10. Spain

Based on the GSP and other preferential duties analysis it has been found that in most of the commodities EU holds the biggest market share followed by USA. It can be attributed to the relaxations in duties which have been extended by the countries.

It is reflected from the above tables that India has an advantage to pay either zero or less duties. However, as shown above, being a USA GSP beneficiary India is allowed duty free entry in USA while trading of identified commodities which is not applicable in the case of EU GSP and other countries. The trading duties of EU countries are much higher. Therefore, the high rate of duties can be taken up as one of the issues so that India may foresee the future business by these biggest importers. India needs lower tariffs for identified goods to help it further integrate with global supply chains so that these industries would become more competitive.

Therefore following are the suggestion for taking up the issues with trade partners in RTAs/FTAs:

- India can look up to more export opportunities in USA and EU in some of the products as these countries apply a Zero per cent tariff to exports originating from India due to GSP arrangement.
- Lower tariffs for identified goods to help it further integrate with global supply chains, and that these industries would have to come more competitive.
- Introduction of new preferential system with the potential targeted countries like China, Japan, Vietnam etc.
- To recommend on fixation of tariffs and tariff related issues (mentioned above) for identified commodities.
- To evolve an overall tariff structure and look into the issue of tariff rationalization;

Reference: Canada Border Services Agency (CBSA), European Commission: Taxation and custom union, United States International Trade Commission, Turkish Customs Tariff, International Trade Administration , Arab Republic of Egypt: Ministry of Fiancé, The Investment and Trade Promotion Center (ITPC)-Vietnam, Japan Customs

Chapter 11 Action plan and Way Forward

A key objective of the study is come out with a road map to boost the exports of value added products from India. In this regard, IL&FS Clusters along with APEDA had undertaken numerous discussions along with industry stakeholders to understand their needs. A brainstorming session on the subject was organized by APEDA in association with CII. It is felt that in the backdrop of the growing trend of the food processing industry in India and the potential of exports of value added products versus raw commodities it was felt that marketing & branding plays a very important role.. Along with this, issues such as dealing with APMC act, supply chain logistics & infrastructure, technology & streamlining the standards for food safety norms, harmonization with international standards etc. are some areas where key focus needs to be diverted. Also, concerns regarding high tariff/duty rates resulting in non-competiveness of Indian Food Products needs to be revisited in the view of focus countries and negotiate trade agreements or establish new FTAs with key trade countries. To encourage further investment in the sector, policies and regulations may also be simplified for the ease of doing business and it should be prioritized by aligning the schemes of different ministries. To comply with stringent quality requirements and traceability systems institutionalizing of global quality framework and standards on a fast track mode and expanding agricultural extension, private and NGO involvement can also play a key role in sensitizing the farmers in use of appropriate fertilizers and pesticides to improve the productivity. Further, there is a need for taking initiatives to increase the availability of skilled and qualified manpower in order to have a better outcome.

The industry feedback for the purpose of this report can be summarized as follows:

Sl No	Particulars
1	Inland Freight Subsidy: Inland freight subsidy was a common issue with all the exporter/industry players. It was suggested that the presence of Inland Container Depots (ICDs) needs to be increased to enhance the connectivity with major sea ports. M/s Sukhjit Starch and Chemicals, a leading starch manufacturer and exporter from India expressed their views their operations were spread across major maize/corn growing states in India. As a result they have also created isolated starch processing units in the different parts of the country. However, the ICD network in India is yet to realize its potential and exporters has to end up paying high freight cost. The freight cost goes up exponentially incase of ICDs which are at a distance of over 300 kms from the seaport.
2	Agriculture Produce Marketing Committee Act: Industry players were of the view that APMC Act in certain states still prove to be a major barrier in conducting procurement operations of raw materials. An increase or decrease of raw material prices has a huge impact

	on the processed food product. As markets are now getting increasingly linked, it does augur well for the processing industry to deal with so much price fluctuations.
3	Higher Import duties by importing countries particularly EU: M/s Capricorn Foods, a leading processor and exporters of Mango pulp, was of the opinion that EU countries impose higher duty tariffs on imports from India. They suggested that India may take up such matters with respective countries and bargain for easing of such duties so that Indian manufacturers gets a larger market exposure.
4	Interest subvention: The industry is of the view that the cost of borrowing is very high in India which proves to be very costly for them. It was suggested that APEDA may look for providing interest subvention package based on FOB value of a shipment.

The recommendations are as follows:

Sl No	Particulars	Recommendation(s)	Relevant Department
1	Marketing and Branding	On the basis of the analysis of the report, it may be understood that the strategy for enhancing the exports of products from India may largely depend on the demand from target countries. The target list of countries along with the projected market size has already been discussed in the previous chapters. Keeping this in mind, it is important to understand the global sentiments in terms of consumer purchase behavior. A report by Deloitte suggests that the retail market globally was US$ 22 Trillion in 2014. As the retail sector continues to grow, it is imperative for Indian processed products to targeted and placed in these stores for better visibility and acceptability by consumers. In the view of this, APEDA may consider entering into agreements with major retailer in the target countries for product placement and visibility. Apart from the above, APEDA may also consider undertaking specific market studies in the targeted export market to understand the consumer behavior towards such products.	• Ministry of Commerce and Industries, Government of India through APEDA.
2	Common Infrastructure Development	The need for core and support infrastructure development has been discussed in detail in Chapter 7 along with proposed interventions. The primary focus of this activity should be to strengthen the export related infrastructures like ICDs, CFS, containerized export enabling infrastructure at the specified sea ports and testing laboratories. In addition to this, the support	• Ministry of Agriculture, Government of India • APEDA • Ministry of Ports and Shipping, Government of India

		infrastructure in terms of secondary and non-regulated markets, cold storages, and warehouses also needs to be strengthened.	• Government Agencies like Container Corporation of India(CONCOR), Central Warehousing Corporation(CWC) • Food Safety and Standards Authority of India • Respective APMCs
3	Financial Concessions	Introduce interest subvention schemes to enhance the competitiveness of Indian exporters. A study may be undertaken to understand the effect of interest rates in exports from India.	• Ministry of Commerce and Industries, Government of India
4	Inclusive trade agreements which benefit the Indian exporters	Based on the GSP and other preferential duties analysis it has been found that in most of the commodities EU holds the biggest market of followed by USA. It can be attributed to the relaxations in duties which have been extended by the country. It is reflected from the analysis that India has an advantage to pay either zero or less duties. However, as shown above, being a USA GSP beneficiary India is allowed duty free entry in USA while trading of identified commodities which is not applicable in the case of EU GSP and other countries. The trading duties of EU countries are much higher. Therefore, the high rate of duties can be taken up as one of the issues so that India may foresee the	• Ministry of Commerce and Industries, Government of India

		future business by these biggest importers. India needed lower tariffs for identified goods to help it further integrate with global supply chains, and that these industries would have to come more competitive. Therefore following are the suggestion for taking up the issues with trade partners in RTAs/FTAs: • India can look up to more export opportunities in USA and EU in some of the products as these countries apply a zero per cent tariff to exports originating from India due to GSP arrangement. • Lower tariffs for identified goods to help it further integrate with global supply chains, and that these industries would have to come more competitive. • Introduction of new preferential system with the potential targeted countries like China, Japan, Vietnam etc. • To recommend on fixation of tariffs and tariff related issues (mentioned above) for identified commodities. • To evolve an overall tariff structure and look into the issue of tariff rationalization.	
5	Evolving the supply chain model	The supply chain analysis shows that the developed countries like the US and EU have an effective model of cooperatives supported by efficient supply chains that make these countries the leaders in processed food categories. However, in case of	• Ministry of Agriculture, Government of India

		India and other developing countries like Bangladesh the production bottlenecks like cost diseconomies, poor quality, increasing domestic demand and inefficient supply chains are the major hurdles to the agricultural exports on the domestic front. Apart from this, declining world demand, competition from other countries, threat from substitutes, etc., are the major external constraints to Indian agricultural exports. Therefore, it may be suggested that the adoption of cooperative model, increase in the supply of agricultural products, diversification of agricultural exports, quality improvement, improvement of the cold storage facilities for the highly perishable agricultural exports, timely delivery of goods etc., are very crucial for the maximization of agricultural exports.	
6	Quality Assurance including labeling	As we have observed, Indian processed food products are mostly rejected based on labeling defects, contamination and MRL levels. However, Indian food processing units have a healthy ISO 9001 and 2200 certification track record. Hence it may be inferred that the contamination happen mostly in post production stage. Hence it may be suggested that a stricter labeling inspection regime may be also included in future. It has been found through various studies that pesticide content usually decreases in the event of higher level of food processing. However, Indian processed products still face such issues. Thus, regulatory authorities may extend their inspection net to the	• Food Safety and Standards Authority of India • APEDA

		backend level and formulate rejection levels for MRLs for different raw materials. It may be appreciated that rejection/non-usage of such products by Indian exporters at the procurement stage would help them in saving considerable time, monetary resources rather than being rejected at the port or entry in the target markets.	