

## INDIAN FOOD PROCESSING INDUSTRY: AN ANALYSIS OF OPPORTUNITIES AND CHALLENGES IN THE CURRENT SCENARIO

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### ***ABSTRACT***

This paper is a comprehensive exploration of the opportunities and challenges facing the Indian food processing industry. In today's globalizing food systems, India's food processing industry has significant potential for growth and development due to increasing incomes, urbanization and evolving consumer tastes. Furthermore, the industry benefits from a huge domestic market, agricultural diversification and government policy support. Despite these advantages, the industry has challenges such as the slow rate of transformation, a large unorganized sector, skill gaps and regional disparities, etc. Additionally, global food safety and environmental standards are posing challenges for India's processed food exports. The industry's complex and heterogeneous structure includes coexisting formal and informal, small and large, high and low value-added, export-oriented and non-export-oriented segments, each with its own technological, output, and employment characteristics. Understanding these opportunities and challenges is crucial for designing effective policies to support the industry's growth and development.

**Keywords:** Challenges, food, opportunities, processing industry.

## ***I. INTRODUCTION***

Food processing involves the intentional transformation of any agriculture, animal husbandry and marine food products from its raw or natural state into a consumable or more durable form of food. In the age of globalization, food processing has become instrumental in global food trade, food security and thereby, in transformation towards global development, health and sustainability goals (FAO, 2023). The Indian food processing industry (IFPI) is an important segment of the Indian manufacturing sector that can be introduced in terms of its product scope and significance. Its product scope covers manufactured and value-added food products. In the Indian economy, its significance may be highlighted in terms of quantitative and literary information available on processed food output, consumption demand, exports, investment, scope of growth, etc. In terms of output, consumption and exports, it is the 5<sup>th</sup> largest industry of the Indian economy. It registered 8.4 per cent average annual growth rate during the last 5 years ending 2020–21. As far as its organized sector is concerned, it, having 41913 firms contributed approximately 6.9, 11, 6.9 and 15.9 per cent of output (value-added), total employment, total fixed assets and total number of firms of the Indian organised manufacturing sector, respectively (ASI, 2021–22). It shared 11.57 and 10.54 per cent of agricultural and manufacturing GDP, respectively, in 2020–21 (MoSPI, 2022–23). It shared 2.48 per cent of the world's processed food exports in 2021, 10.5 per cent of India's total exports and 25.6 per cent of agri-exports in 2022-23. It shared 32 per cent of India's food market. It ranked 15<sup>th</sup> in the Indian industrial sectors in terms of cumulative foreign direct investment inflows (USD 6.19 billion) between April 2014 and March 2023. Recently released, the Household Consumption Expenditure Survey for 2022-23 (HCES, 2022-23) revealed that urban households in India spent 10.5 per cent of their monthly per capita consumption expenditure on processed food and beverages, while rural households spent 9.4 per cent. In the context of 2023 being designated as the International Year of Millets, leading supplier of raw material, increasing demand for branded food, 100 per cent tax exemption, emerging start-ups/entrepreneurs, rapidly moving towards being the 3<sup>rd</sup> largest economy of the world, etc. also, it is considered a significant industry. This industry has government support in terms of supportive policy environment, tax and other reforms.

Further, the significance of IFPI may be understood well with the support of the research works in the context of the strong connections and interactions food processing promotes between agriculture, industry and rural development. It is a significant industry in terms of its backward linkages with agriculture and structural change bonus to agriculture (Lewis, 1954; Fei and Ranis, 1964; Hirschman's linkages hypothesis, 1958), crop diversification and commercialization of agriculture (Sharma and Bathla, 2012), linkages between two pillars of the economy, i.e., industry and agriculture (Ilyas and Goyal, 2007; Hyder and Bhargava, 2016), backward and forward linkages (Khosla, 2019), the bond between food processing, agricultural growth and market competition (Kalirajan and Bhide, 2007), its growth potential due to changing consumption patterns (Pingali and Khajawa, 2004; Dev and Rao, 2004; HCES, 2022-23), urbanization induced diet diversification, towards consumption of dairy, fish, meat, vegetables, fruits, and legumes– foods (FAO, 2023), structural changes in agricultural exports by developing economies (Wilkinson, 2004), variability between regions in dietary patterns (Green et al., 2016), and the recognition of 2023 as the International Year of Millets. Also, IFPI is important and prospective industry in terms of handling developmental concerns such as critical issues of disguised rural unemployment in agriculture, rural poverty, food security, food inflation, prevention of food wastage and providing improved nutritious food to the masses. However, it is an important industry for the growth and development of the Indian economy (Economic Survey, 2022-23) and considered a sun-rising industry of the Indian economy today.

Keeping in view the importance and prospects of this industry in India, this study is set to analyze the challenges and opportunities facing this industry in the current economic environment. It is expected to provide us with a set of useful information for having a closer insight into the industry to suggest the way forward for its faster growth and development in the future. For meeting the objectives of the study, this study is composed of four sections. Section one above introduces the industry. Section two presents the methodology and data used for the study. Section three, the core section of the study, explores the opportunities and challenges facing this industry. The last section concludes the study.

## ***II. METHODOLOGY AND DATA***

This paper makes use of secondary data collected from the Annual Survey of Industries (ASI) 2021–22, which is published by the Central Statistical Organization, Ministry of Statistical & Programme Implementation, Government of India, New Delhi. ASI has been the main source of industrial statistics in India of the organized manufacturing sector on the annual frequency at 2-digit, 3-digit, 4-digit and 5-digit (Unit-level) product classification of industries since 1959. Also, the study uses data on foreign direct investment inflows of the food processing industry, processed food exports, post-harvesting losses, etc., which have been sourced from various annual reports of different ministries and departments of the Government of India, such as the Ministry of Food Processing Industries, NABCONS (a subsidiary of NABARD), Ministry of Commerce and Industry, Department of Promotion of Industry and Internal Trade (DPIIT), India Brand Equity Foundation (IBEF), Statistics Times, Agricultural and Processed Food Products Export Development Authority (APEDA), Household Consumption Expenditure Survey, 2022-23, etc. With this data set, a descriptive methodology has been used to explore the opportunities and challenges of this industry.

## ***III. AN ANALYSIS OF OPPORTUNITIES AND CHALLENGES***

### ***(A) OPPORTUNITIES***

The opportunities before any industry relate to the external factors prospective to its growth and development. IFPI has tremendous opportunities in terms of diversifying agriculture, a huge gap between production and processing rates, rising income and changing food preferences, international convergence of tastes, expanding the avenues to the export of processed foods, untapped rural markets, priority sector status by the government and more. A summary analysis of these opportunities is presented below.

The principal source of raw materials for IFPI is agriculture; therefore, it has strong backward linkages with agriculture. The share of expenses incurred on the purchase of raw materials, primarily sourced from the agricultural sector, is around 85 per cent or more of its total outlay (Ali et al., 2009). The Indian economy has always been agrarian in nature and is now experiencing diversification across and within crop, livestock, forestry and fishery segments.

Within the agricultural sector, the output and employment share of the non-crop sub-sectors is gradually increasing. However, diversification in Indian agriculture is taking place in terms of shifting away from crop production to other agricultural activities (Singh et al., 2006). Diversification and changing cropping patterns in the Indian agriculture offer an opportunity to food processors to get diversified raw materials at low prices. The availability of raw materials at low prices reduces the cost of food processing, which increases the profitability of food processing firms. Consequently, food processing firms invest more in technological upgradation and processing activities, such as cleaning, shorting, grading and cutting, which enhance their efficiency, productivity and output growth.

The size of domestic demand for any product is shaped by the size of the population and its choice and preferences. India, being the most populated country in the world, has a substantial number of consumers who have different sets of choices and preferences for processed food items. The demographic characteristics of India are favourable to the demand side of the processed food products market. India has more than 1.42 billion population, increasing at 1.1 per cent, of which 50 per cent are people below 25 years. This age segment of the population is the main source of demand for processed food items in India. Furthermore, private final consumption expenditure on food items constitutes a sizeable portion of India's GDP. However, India's demographic profile has opened the window of opportunity for the growth of IFPI.

The difference between the production of raw materials and their processing rates is an opportunity as well as a challenge to IFPI. A recent study by Deloitte (July 2021), commissioned by the Ministry of Food Processing Industries (GOI), estimated that the levels of processing of agricultural commodities in India have been low. For 2018–19, the extent of processing was 68 per cent, 3.3 per cent, 11.6 per cent, 34.2 per cent, 15.4 per cent, 21.1 per cent for food grains, fruits and vegetables, poultry, meat, fish, milk, respectively. It has also been low as compared to other countries. This report provides data on the global comparison of India in the context of processing levels (Table 1).

<b>Table 1. Global Comparison of Food Processing Levels (2018-19)</b>						
<b>Commodity</b>	<b>India</b>	<b>USA</b>	<b>China</b>	<b>Brazil</b>	<b>Thailand</b>	<b>Italy</b>
Paddy	92	...	88	95	93	85
Wheat	78	33	41	88	69	...
Oilseeds	49	46	72	...	54	84
Fruit	4	20	7	38	46	42
Vegetables	3	11	3	...	32	38
Meat	34	87	...	56	14	55
Milk	21	65	...	28	29	89
<b>Source: NABCONS, 2022</b>						

Table 1 provides an optimistic view for Indian food processors where, except for fruits, vegetables and milk products, India is in a satisfactory position. In case of paddy processing, India was in a highly satisfactory position. This data implicitly shows that India can improve its processing levels internationally. This indicates that India has both the capability and the scope of increasing the processing level, which would support the growth and development of this industry and other associated economic sectors, especially the agricultural sector.

In the context of globalization and economic development, consumers, even in rural areas, are exposed to new food items. The choices between global versus traditional (local) food items are shifting towards global and processed food products. Since the globalization of the Indian economy in 1991, India is experiencing dramatic changes in consumers' food preferences induced by rising incomes, changing lifestyles, the changing nature of jobs, nuclear families, etc. Pingali and Khjawa (2004) found that the food demand in India is transforming due to income-induced diet diversification and diet globalization. Chenggapa et al. (2004) stated that Indian consumers have historically preferred fresh and unpackaged food, but recent changes in consumption patterns show ample opportunities for processed and packed food products, especially amongst middle- and higher-income classes. Ravi and Roy (2006) and Kumar et al. (2007) found that the food consumption pattern is diversifying towards high value-added food products, such as fruits, vegetables, dairy, poultry, fish and processed food. According to the Household Consumption Expenditure Survey (2022-23), the share of expenditure on processed foods and beverages has increased from 9 to 10.5 percent for urban households and from 7.9 to 9.4 percent for rural households, from 2011-12 to 2022-23. This trend indicates that Indian

households are experiencing both Engle's law (1957) and Bennet's law (1959) in their spending patterns. Engle's law states that the proportion of food expenditure decreases as household income increases. Bennet's law explains that as income grows, households diversify their food purchases from staples to include fruits, vegetables, eggs, meat, and other items. These economic laws illustrate the changing share of food expenditure as income grows and the reorganization of the food basket due to increased income. However, India is experiencing the co-applicability of Engel's law and Bennett's law that means rising income levels in India are restructuring the fraction of food expenditure to income and food basket towards processed and value-added food products, respectively, over time. Thus, an income-induced transformation of consumption patterns towards processed and high value-added food products is offering a window of opportunity to this industry to grow fast.

India has several factors that are favourable to the development of the processed food exporting sector. Growing population, urbanization, increasing incomes and changing food preferences are favourable factors for the growth of the domestic processed food market in India, which supports the perspective of Jafee and Gordon (1993) that a sizeable domestic market is a precondition of success in the production and export of processed food products. Also, the Indian processed food industry has potential to grow in terms of the conclusions of a pioneer study by UNCTAD (1997) on developing countries, which concluded that the expanding economies of South-East Asia (higher-income developing economies), the transition effect in Eastern Europe and the World Trade Organization (WTO) regulatory and export promotion frameworks are supportive of processed food exports by developing economies. However, Wilkinson (2004) found that processed food exports by developing countries are experiencing structural changes towards non-traditional items, such as fish, seafood, fruits and vegetables. Jongwanich and Ramos (2009) also found that the exports by developing countries are experiencing structural changes from traditional agricultural exports, such as tea and coffee. Suanin (2020) suggests that the coexistence of high-income and low-price elasticities for processed food imports by developed countries creates export opportunities for developing countries like India. However, the domestic demand-driven export potential (Jafee and Gordon, 1993) of India, its geographical proximity to South-East Asian economies, increasing trade flows under the WTO framework

(UNCTAD, 1997) and structural changes in processed food exports (Wilkinson, 2004; Jongwanich and Ramos, 2009) are all favourable factors for processed food exports by India.

As far as the organized sector of the Indian food processing industry is concerned, the fish and fish products (seafood products), meat and meat products and fruits and vegetables segments of IFPI were the most export-intensive segments, exporting 35, 7 and 3 per cent of their ex-factory products and by-products (ASI, 2021–22), respectively. In addition, the government is now supporting export-oriented firms in this industry. However, overall, the Indian organized food processing industry exported only 2 per cent of its output directly in the year 2021–22. The export share of each segment in its output reveals the heterogeneity in their export involvement.

As Weber's theory of industrial location (1909) states, industries are located where the transport cost of raw materials and final products is minimal and the demand for the products is high. As of now, the demand for processed food items is highly concentrated in metro cities, while in the rural sector, it is still low. However, the rural sector has potential for the growth of demand for processed food items, which needs to be explored by food processors and food businesses.

IFPI is a raw materials based industry (Ali et al., 2009). Diverse agro-climatic conditions, large livestock population and plentiful round-the-year supply of raw materials are favourable factors for the processed food industry. India has 127 agro-climatic zones, which support the uninterrupted supply of a variety of raw materials to these industries round the year. This indicates that India has a comparative advantage in the trade of processed foods. The diversified and continuous supply of low-cost raw materials has implications for growth and product diversification in this industry. However, favourable conditions of the raw material supply serve as an opportunity for growth of this industry.



## **(B) CHALLENGES**

This section discusses the challenges facing IFPI, which include external factors that hinder the growth and development of this industry. Suggesting the way out for its speedy growth and development, this section explores the factors that pose challenges to this industry including preference for fresh food, huge informal segment, lack of required skill set, sub-sectoral imbalances, harvest and post-harvest wastage, food quality and environmental regulatory frameworks.

The growth and development of any industry crucially hinges upon the quantity demanded and the structure of demand for its products in the market, and the food processing industry is no exception to this. The quantity and demand structure of the product depend on the choices and preferences of the consumers for the product. Indian food consumption patterns are, without a doubt, shifting towards processed and high value-added food products from traditional foods (HCES, 2022-23), but it still has a long way to go. Chenggapa et al. (2004) stated that Indian consumers historically prefer fresh and unpackaged foods, whereas Ali (2007) stated that the demand for meat products in India is affected by religious beliefs. For example, the majority of the Indian population consists of Hindus, who worship cow. Muslims, who constitute a sizeable population in the country, do not consume pork. These, and more, religious beliefs hinder the growth of the demand for meat and meat products and consequently, the growth of the food processing industry. To clarify, the authors of the present paper respect the beliefs of the people.

The structure of IFPI is dualistic and idiosyncratic owing to the existence of the sizeable organized and unorganized food processing sectors in India. The coexistence of organized and unorganized food processing sectors poses policy-related challenges. The reason is that the nature, size, input requirement and technological profile of food processing units are different in these two sectors. In the organized sector, productivity is higher with a low volume of employment while in the unorganized sector, productivity is lower with a high volume of employment. This coexisting dual system poses challenges before planners and the government.

The characteristics of IFPI in terms of processing and preservation activities differ substantially across its sub-sectors. In fact, IFPI may also be classified as animal-, agro- and plant-based industries, to name a few, which need different kinds of processing and preserving technologies. Their diverse technological requirements require a different kind of skill and expertise. Although there are multiple human resources' development institutions imparting technical and scientific education relating to food processing and preservation, there is still a mismatch between the skill endowments and the skill requirements of the industry. However, special skill development programmes need to be designed to connect the academia and the industry to narrow down the skill gaps in the food processing sector. Many small and medium food processing units operate as SMEs, leading to a lack of resources for advanced infrastructure and technology upgrades.

FPI is characterized by a multitude of small-scale, non-integrated, and heterogeneous product firms, causing an imbalance in the planning, growth, and development of this industry. A comparison of the percentage share of sub-industries in terms of firms (Table 2) shows that the industry is dominated by a few sub-industries. They use outdated technology and thereby, remain noncompetitive in the world market. For example, grain milling (46.9 per cent), other products (18.6 per cent), edible oils (6.7 per cent), beverages (5.4 per cent) and dairy products (5.2 per cent) constitute 82.8 per cent of food processing firms of India's organized-sector food processing industry (ASI, 2021-22).

This heterogeneity in size shows the possibility of the presence of increasing, constant and negative returns to scale in the industry. Non-constant returns to scale implicitly exposes the possibility of underutilization and/or overutilization of resources in the industry. In different words, non-constant returns to scale imply sub-optimal production structure of a productive entity.

<b>Table 2. Sub-sectoral Distribution of Indian Food Processing Firms and Exports, 2021-22</b>				
<b>NIC (2008)</b>	<b>Industry Description</b>	<b>No. of Firms</b>	<b>% Share of total Firms</b>	<b>% Share in Exports</b>
1010	Meat & meat products	173	0.4	7
1020	Seafood products	681	1.6	35
1030	Fruits & vegetables	1319	3.2	3
1040	Edible oil and fats	2799	6.7	1
1050	Dairy products	2170	5.2	0
1061	Grain mill products	19648	46.9	0
1062	Starch & starch products	567	1.4	1
1071	Bakery products	1849	4.4	1
1072	Sugar	737	1.8	3
1073	Confectionary	773	1.8	0
1074	Other products	7798	18.6	7
1080	Animal feeds	1144	2.7	2
1100	Beverages	2254	5.4	0
<b>Total</b>		<b>41912</b>	<b>100</b>	<b>100</b>
<b>Source:</b> Author's estimates.				
<b>Note:</b> Here, 0 means sub-sector didn't export or exported less than 1 per cent of industry exports.				

As mentioned earlier, agriculture is the main source of raw materials for food processing industries. Therefore, it is significantly impacted by harvesting and post-harvesting losses in agricultural production. In low-income countries, the causes of food losses and waste are mainly linked to financial, managerial, and technical constraints in harvesting techniques, storage and cooling facilities in challenging climatic conditions, infrastructure, packaging, and marketing systems (FAO, 2011). India still has a remarkably high level of harvesting and post-harvesting losses in agricultural production in comparison to developed countries. Studies by the Central Institute of Post-Harvest Engineering & Technology (CIPHET, 2015) and the NABARD Consultancy Services (NABCONS, 2022) estimated quantitative losses in major agricultural products in India. The different stages of losses considered by the studies are harvesting, collection, thrashing, grading/shorting, winnowing/cleaning, drying, packaging, transportation and storage of the commodity.

Although, Indian processed food demand is growing fast in domestic as well as in international markets, under the pressure of consumers' health awareness and public and private concerns over environmental protection multiple provisions of food safety and environmental

standards are posing challenges before this industry. Thereby, market access for the processed food products of developing economies in the international markets in developed countries is hindered. The Food Safety and Standards Authority of India (FSSAI) sets the food safety standards in India. Its tight scrutiny of safe food products makes entry, growth and existence of new players in the market difficult. Consequently, older and larger incumbent food processors take the benefit of this situation and sometimes become rent seekers. In the international market, the WTO Agreement on Sanitary and Phyto-sanitary Measures (SPS) and Codex Alimentarius Commission (CODEX) are food safety standards, while international environmental standards are SPS, Technical Barriers to Trade (TBTs) and International Organization for Standardization (ISO). However, the compliance of these food safety and environmental standards not only reduces the flow of food transactions but also increases the cost to the food processors. Consequently, profitability and investments in the food processing sector are affected adversely.

#### **IV. CONCLUSIONS**

The IFPI is a significant manufacturing sector in terms of output, consumption, employment, and exports. It has strong backward and forward linkages with agriculture and exports, making it a special industry in the Indian economy. Globalization, increasing income, changing food preferences, and a shift towards processed, packaged, ready-to-eat, and functional foods are creating opportunities for this industry. Diversifying agriculture, a large domestic market, an unexplored rural market, export potential, and policy support are also favorable factors. However, the industry faces challenges such as slow changes in food preferences, a significant unorganized sector, skill shortages, size differences, and post-harvest losses. Emerging environmental and food safety standards at national and international levels are also posing challenges for both domestic and export demand for processed foods. To support the growth and development of this industry, coordinated policymaking at central and state levels, an efficient regulatory framework, linking food processors to input sources (farmers), institutional support for agricultural markets, improved access to credit, and export promotion are necessary.

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