Emerging Potential of Food Processing Sector in India

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Abstract:

This study explores the evolution of India's food processing sector from traditional methods to modern technology, emphasizing its global significance in food security and sustainability. It outlines primary and secondary food processing types and highlights the sector's benefits, including reduced waste, employment generation, and increased export revenue. Food products dominate the industrial landscape, comprising 15.89% of all factories and 16.74% of operational ones. Of 246,504 total factories in India, 198,628 are active, employing over 16.6 million people, utilizing ₹364,135 crores in fixed capital, and generating ₹898,330 crores in output. In 2019–20, the sector employed 20.32 lakh people in registered units (12.22% of industry employment) and 51.11 lakh in 2015–16 (14.18%). India's food exports rose from $34.42 billion in 2017 to $44.71 billion in 2021, increasing its global share to 2.48%. FDI trends show fluctuations, peaking at ₹6,414.67 crore in 2019–20 and declining sharply in 2020–21 due to COVID-19. Despite growth potential and resource availability, the sector faces a critical shortage of skilled manpower, requiring targeted strategies to enhance productivity and profitability.

Keywords: *Food Processing; Growth; Foreign Direct Investment; Gross Value Added;* ***Industries*****.**

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Introduction

The food processing industry in India has ancient roots, with traditional preservation methods like salting, sun-drying, and fermentation. Today, these are enhanced with advanced technology and modern preservatives (Ebenezer & Savitha, 2023). Food processing involves converting agricultural, animal, and marine products from their raw state into consumable or longer-lasting forms. As the world's second-largest food producer, India's food processing sector holds immense growth potential (Sohanlal, 2022). In a globalized economy, food processing is vital for international food trade, food security, and supporting global development, health, and sustainability goals (FAO, 2023). Food

processing is categorized into primary and secondary types. Primary products include processed fruits and vegetables, while secondary processing creates items like jam, butter, and sauces. These processes help develop new products and extend shelf life, ensuring freshness for longer periods. A robust food processing industry can enhance socio-economic conditions by reducing waste, increasing product value, generating employment, and boosting export earnings (Joseph & Mammen, 2020).

This activity occurs in both large-scale industries and small-scale home setups. With over 45.76% of India's workforce in agriculture, the country has a strong supply of raw materials. In 2018–19, horticultural production reached 355.48 million tons. Processing helps transform unprocessed goods into long-lasting products, reducing wastage (Alam, 2018). The industry contributes significantly to economic growth and job creation. India's food processing sector is expected to generate 9 million jobs by 2024. By 2030, household consumption is projected to quadruple, positioning India as the fifth-largest global consumer of food and food technology (Hindu, 2023). The sector supports sustainable development by reducing spoilage and facilitating global exports. It connects Indian farmers to domestic and international markets. The Ministry of Food Processing Industries continues to build a strong value chain to draw investments.

Currently, the sector employs about 1.93 million people, accounting for 12.38% of registered factory jobs. The unregistered sector adds another 5.1 million workers, according to the NSSO 73rd Round. The industry is prominent in areas like grains, sugar, oils, beverages, and dairy. In rural areas, it benefits from ample resources and labor. The government allocated ₹2,000 crore through NABARD in 2014–15 to support rural food processing and food parks. Farmers increasingly sell crops directly to processors, boosting yields. With rising population and food demand, the need for expanded processing infrastructure is urgent. This article explores the sector's role in economic growth, analyzing trends in GDP contribution, exports, employment, foreign investment, and development challenges.

1. Research Methodology

This study used secondary data from sources including the Ministry of Food Processing Industries, The Hindu, and various journals, covering data from 2017–2023. It examines Gross Value Added, GDP contribution, employment, fixed capital investment, exports, and FDI, using appropriate statistical tools for analysis.

Compound Annual Growth Rate (CAGR):

Compound Annual Growth Rate (CAGR) is a metric used for measuring the average annual growth rate of Gross value added (GVA) and fixed capital investment in food processing industries.

$$CAGR = \left\{ \left(\frac{EV}{BV} \right)^{\frac{1}{n}} - 1 \right\} \times 100$$

Where,

EV= Ending Value

BV= Beginning value

n = Number of years

- **Coefficient of variation (CV):**

Coefficient of variation (CV) has been employed to measure the variability of Gross Value Added (GVA) data for 2012-13 to 2020-21.

$$CV = \frac{\sigma}{\mu} * 100$$

Where,

σ = Standard Deviation

μ = Mean

The analysis will show case the current performance and emerging potential of Agro processing industries in India.

3. Results and Discussion

3.1 Sectorwise Gross Value Added (GVA) in India

Gross Value Added (GVA) is a measure of the economic value created by a business, industry, or sector. It represents the difference between the output of goods and services and the intermediate consumption (the value of inputs used in producing those goods and services). Essentially, GVA shows how much value is added to raw materials or intermediate products by the production process. GVA is important as it helps to understand the contribution of different sectors to the economy and is a key component in calculating a country's Gross Domestic Product (GDP). When summed across all sectors and adjusted for taxes and subsidies, GVA equals GDP

Table 1: Sectorwise Gross Value Added (GVA) in India at Constant 2011-12 Prices

(Rs. In Lakh Crore)

Economic Activity	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	CV
GVA -All India	85.46	90.64	97.12	104.92	113.28	120.34	127.34	132.19	125.85	15.38 %
% Growth rate	5.42	6.06	7.15	8.03	7.97	6.23	5.82	3.81	-4.80	-
GVA Manufacturing	4.87	15.61	16.84	19.04	20.55	22.09	23.29	22.61	22.48	31.22 %
% Growth rate	5.46	4.98	7.88	13.06	7.93	7.49	5.43	-2.92	-0.57	-
GVA in Agriculture, Forestry and Fishing	15.24	16.09	16.06	16.16	17.26	18.40	18.79	19.82	20.48	10.57 %
% Growth rate	1.46	5.58	-0.19	0.62	6.81	6.60	2.12	5.48	3.33	-
GVA-FPI	1.30	1.30	1.34	1.61	1.79	1.93	2.36	2.26	2.37	24.86 %

Source: Annual Report 2022-23, MFPI, Govt. of India.

(Note: CV - Coefficient of variation)

Throughout the fiscal years 2012–13 to 2020–21, Table 1 shows a general rise in Gross Value Added (GVA) across Indian sectors, reflecting economic growth. A notable decline occurred in 2020–21, likely due to COVID-19. Manufacturing GVA

grew from 4.87 in 2012–13 to a peak of 23.29 in 2018–19 but declined slightly thereafter. Agriculture, forestry, and fisheries GVA increased steadily from 15.24 to 20.48, while food processing rose from 1.30 to 2.37, showing consistent growth. Although manufacturing showed volatility in recent years, agriculture and food processing sectors demonstrated continuous contributions to the economy.

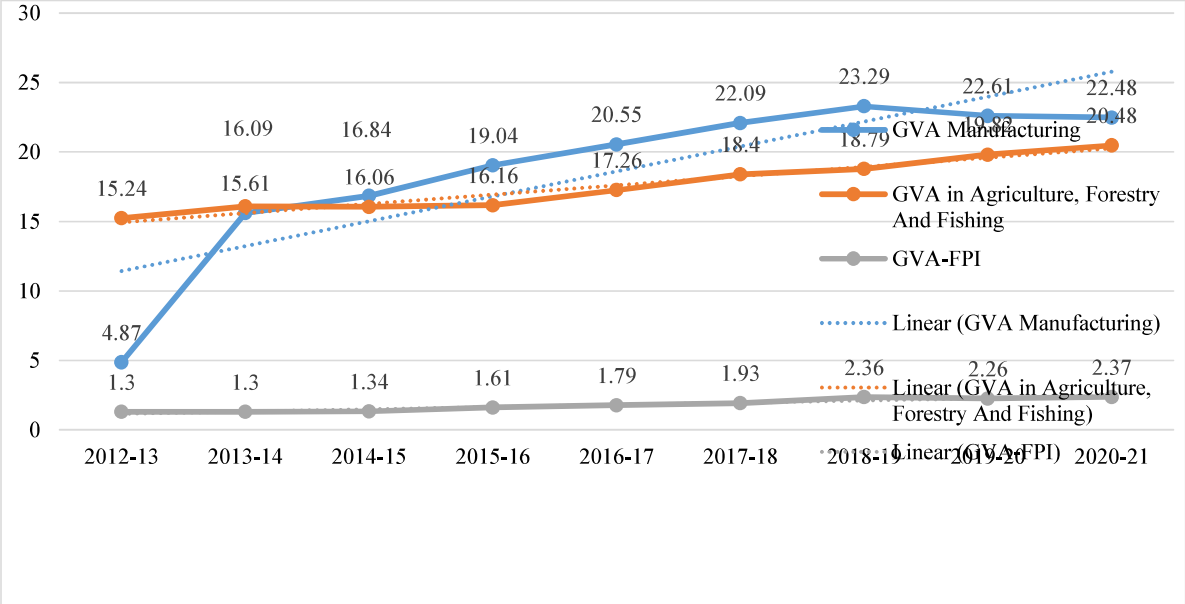


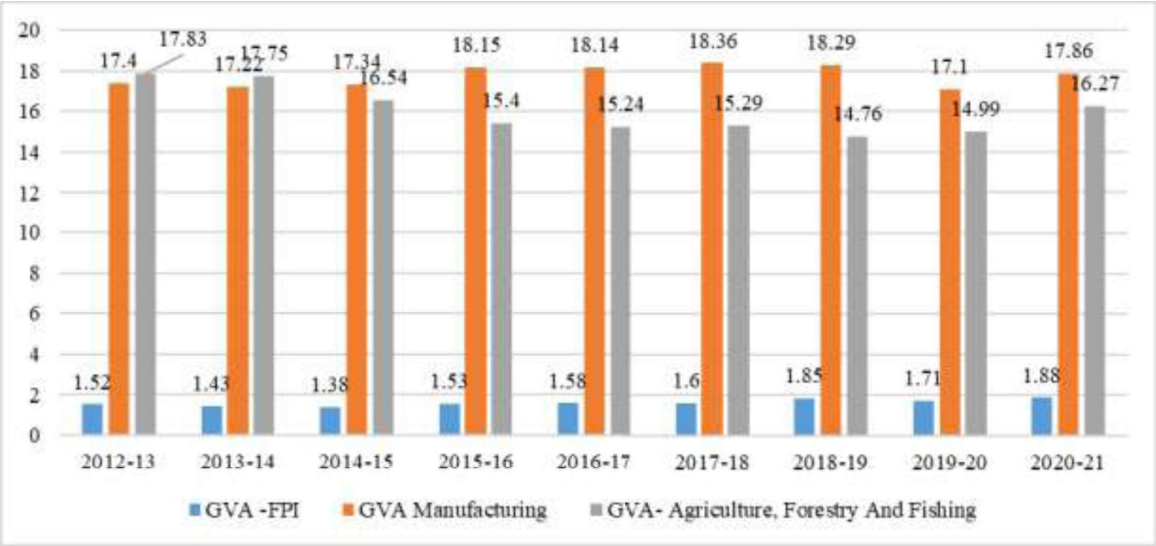
Figure 1: Gross Value Added (GVA) by Food Processing Industries (FPI)

Fig. 1 illustrates Gross Value Added (GVA) trends for Manufacturing, Agriculture, and Food Processing Industries from 2012-13 to 2020-21. It features three distinct lines: blue for Manufacturing, orange for Agriculture, Forestry, and Fishing, and grey for FPI. However, the Gross Value of Manufacturing (GVA) increased significantly from 4.87% in 2012-13 to 23.29% in 2018-19, stabilizing around 22.48% in 2020-21. Agriculture, Forestry, and Fishing's GVA increased from 15.24% to 20.48%, while FPI's GVA remained stable from 1.3% in 2012-13 to 2.37% in 2020-21. In summary, the graph presents linear trend lines for each sector, indicating an overall rising tendency for the observed time period. Manufacturing is growing at the highest rate, with the least growth observed in FPI, Agriculture, Forestry, and Fishing.

3.2 Percentage share in overall GVA of FPI, Manufacturing and Agriculture, Forestry and Fisheries:

Fig. 2 shows the Gross Value Added (GVA) percentages for Food Processing Industries (FPI), Manufacturing, and Agriculture (including Forestry and Fishing) from 2012-13 to 2020-21, with slight volatility. According to the graph, the GVA for Food Processing Industries (FPI) has a relatively stable trend, starting at 1.52% in 2012-13 and rising to 1.88% by 2020-21. The GVA for Manufacturing is consistently higher, starting at 17.40% in 2012-13 and slightly fluctuating, peaking at 18.36% in 2017-18. The GVA for Agriculture, Forestry, and Fishing has

gradually declined, reaching a low of 14.76% in 2018-19. However, there is a slight recovery in the final two years, with the GVA rising to 16.27% by 2020-21.



Source: Annual Report 2022-23, MFPI, (Govt. of India, 2022-23).

Figure 2: (%) share in overall GVA of FPI, Manufacturing and Agriculture, Forestry and Fisheries

The overall GVA for FPI remains low but shows a slow upward trend, while the GVA for FPI remains low with minor fluctuations.

3.3 The registered industries in India and total persons engaged in FPI.

Key parameters of registered industries are displayed in the above table. The table ranks different industries based on variables like the total number of factories operating, fixed capital, employment, and production. Food products are the most prominent industry, determining 15.89% of factories and 16.74% of food products. Similarly, a large number of people engaged in this sector constitute 13.84% of the total production. Although they rank second in terms of both total and active factories, Other Non-Metallic Mineral Products comprise less fixed capital and employment.

Table 2: Key parameters of registered industries in India

Rank	Total No. of factories	No. of factories in operation	Fixed Capital	Total Persons Engaged	Output
1	***Food Products (15.89%)***	***Food Products (16.74%)***	Basic Metals (18.66%)	***Food Products (11.10%)***	***Food Products (13.84%)***
2	Other Non-Metallic Mineral Products (12.03%)	Other Non-Metallic Mineral Products (12.06%)	Coke & Refined Petroleum Products (13.90%)	Textiles (9.80%)	Basic Metals (13.30%)

3	Textiles (7.30%)	Textiles (6.82%)	Other Industries (12.76%)	Wearing Apparel (7.58%)	Coke & Refined Petroleum Products (12.11%)
4	Fabricated metal products (6.88%)	Fabricated metal products (6. 36%)	Chemicals & Chemical Products (8.87%)	Basic metals (7.25%)	Chemicals & Chemical Products (8.83%)
5	Rubber & Plastic Products (6.02%)	Rubber& Plastic Products (5.91%)	Other Non-Metallic Mineral Products (6.65%)	Motor Vehicles, Trailers & Semi Trailers (6.51%)	Motor Vehicles, Trailers & Semi Trailers (7.00%)
Aggregate Total (all industries)	2,46,504	1,98,628	364,135,165	16,624,291	898,330,129

Source: Annual Report 2022-23, MFPI, Govt. of India.

*(Note: Figures in parentheses indicate percentage to total; *Estimates of Fixed Capital and Output are in Rs. Lakh)*

In terms of overall factory count and active factory count, textiles come in third, and they employ a significant number of people. With 18.66% of all fixed capital, basic metals are the industry with the highest capital intensity. Coca-Refined Petroleum products are capital-heavy industry as it ranks third in terms of both production and fixed capital. Rubber & Plastic Products and Fabricated Metal Products come in fourth and fifth place, respectively, but they contribute less of the production and fixed capital. In terms of fixed capital and production, Chemicals & Chemical Products, Motor Vehicles, Trailers, & Semi-Trailers are also significant. On the whole, the totals for all industries combined contribute to 246,504 factories, 198,628 of which are currently in operation, employing 16,624,291 people, utilizing 364,135,165 in fixed capital, and producing 898,330,129 in output.

Table 3: Employment in Food Processing Industry (lakh)

Sector	Food Processing* Industry	Share of Women workers	Overall Industry	(%) Share of FP sector
Registered# (2019-20)	20.32	2.27	166.24	12.22
Un-incorporated (2015-16)**	51.11	12.62	360.41	14.18

**: Includes food products and beverages segments; #: Source: Annual Survey of Industries 2019-20; **Source: NSSO Report No.582 (73/2.34/2) on Economic Characteristics of Unincorporated Non-Agricultural Enterprises (Excluding Construction)in India; NSS 73rd Round (July 2015 - June 2016)*

Table 3 provides data on the employment in the Food Processing (FP) industry compared to the overall industry for two different periods: registered units in 2019-20 and unincorporated units in 2015-16. The Food Processing (FP) industry employed 20.32 lakh people in registered units in 2019-20, accounting for 12.22% of the overall industry employment. In 2015-16, the sector employed 51.11 lakh individuals, representing 14.18% of the total employment across all industries. This data shows that the FP sector significantly contributes to employment in registered and unincorporated industrial sectors, with a higher share in the unincorporated sector.

3.4 Number of Units and Persons engaged in the registered FPI sector:

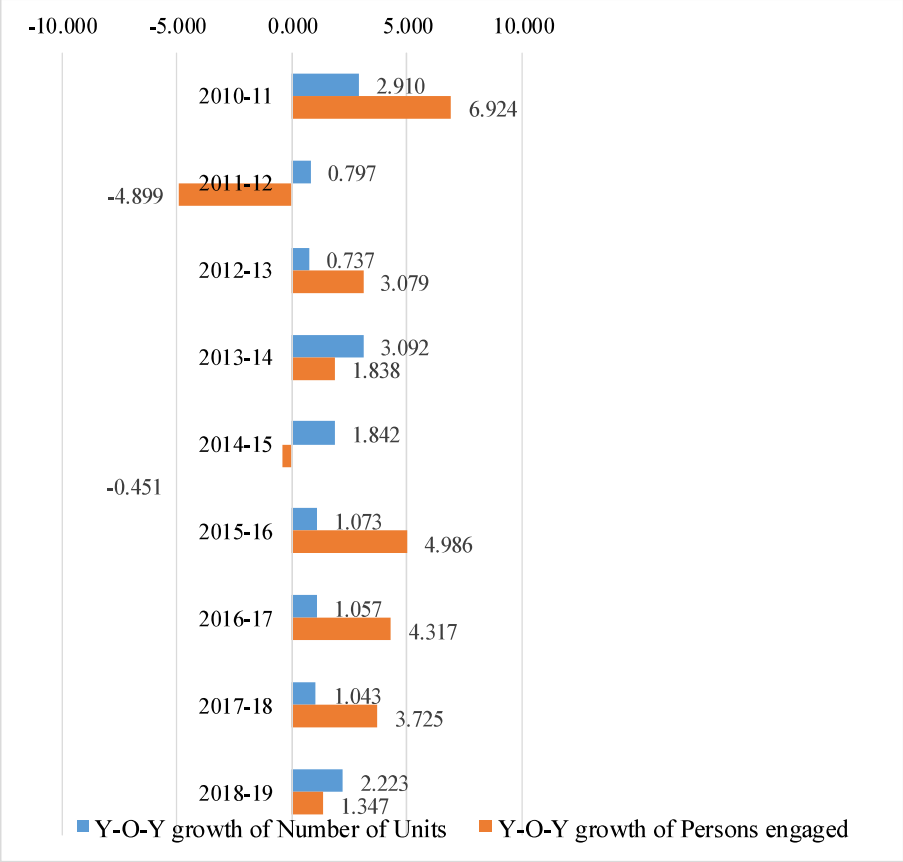


Figure 3: Number of Units and Persons engaged in registered FPI sector and Year on Year growth Rate (Y-O-Y)

Source: Authors' calculations based on the data in the Annual Report 2022-23, MFPI, Govt. of India.

The graph shows the annual growth rates of units and persons engaged from 2010-11 to 2018-19. FPIs require an enormous number of employees; the FPIs that were registered had either directly or indirectly created employment (A. Sachindra Babu, 2021). The number of units showed moderate growth with some fluctuations, starting at 2.910% in 2010-11 and decreasing to 0.737% in 2012-13. It then increased slightly to 3.092% in 2013-14, reaching a peak of 3.092% in 2013-14. The number of

persons engaged declined from 6.924% in 2010-11 to -4.899% in 2011-12, but rebounded to positive levels in subsequent years. The growth rate declined after 2015-16, dropping to 1.043% in 2017-18 before slightly increasing to 1.347% in 2018-19. The graph demonstrates that the number of units experienced more volatility, including periods of sharp declines and growth.

3.5 GVA and Fixed Capital Investment in registered FPI in India

Fig. 5 compares the trends of Fixed Capital Investment (FCI) and Gross Value Added (GVA) in registered Food Processing Industries (FPI) in India from 2010-11 to 2019-20.

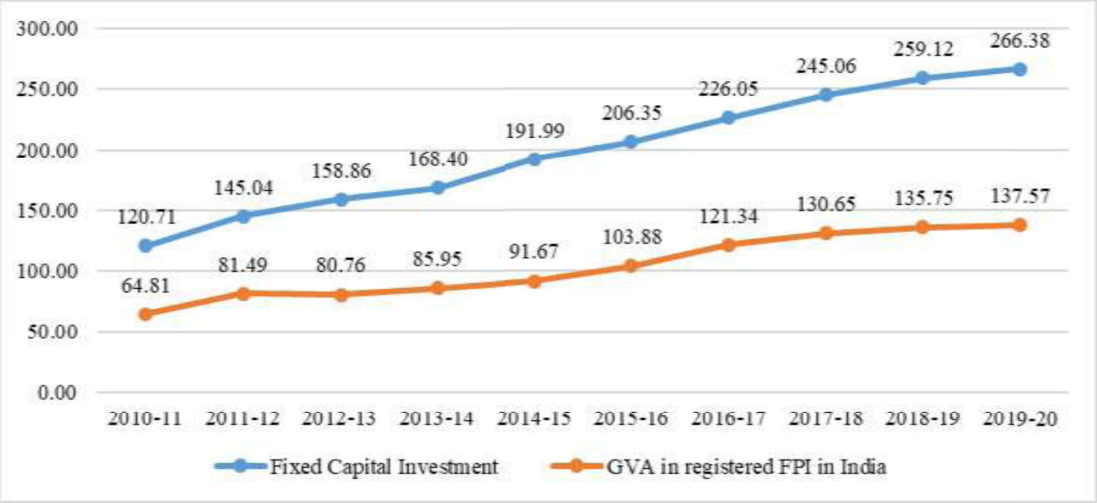


Figure 4: GVA and Fixed Capital Investment in registered FPI in Rs. 000' Crore

The Fixed Capital Investment started at 120,705.11 in 2010-11 and rose steadily each year, reaching 145,038.24 in 2011-12, 158,864.84 in 2012-13, and 168,400.71 in 2013-14. The GVA in registered FPI started at 64,809.79 in 2010-11 and continued to grow modestly, reaching 91,667.63 in 2014-15, 103,878.31 in 2015-16, 121,339.23 in 2016-17, 130,647.39 in 2017-18, 135,745.13 in 2018-19, and finally reaching 137,572.58 in 2019-20. Fig. 4 shows a consistent rise in both Fixed Capital Investment and GVA in registered FPIs in India, with Fixed Capital Investment showing a more pronounced and steady increase than GVA.

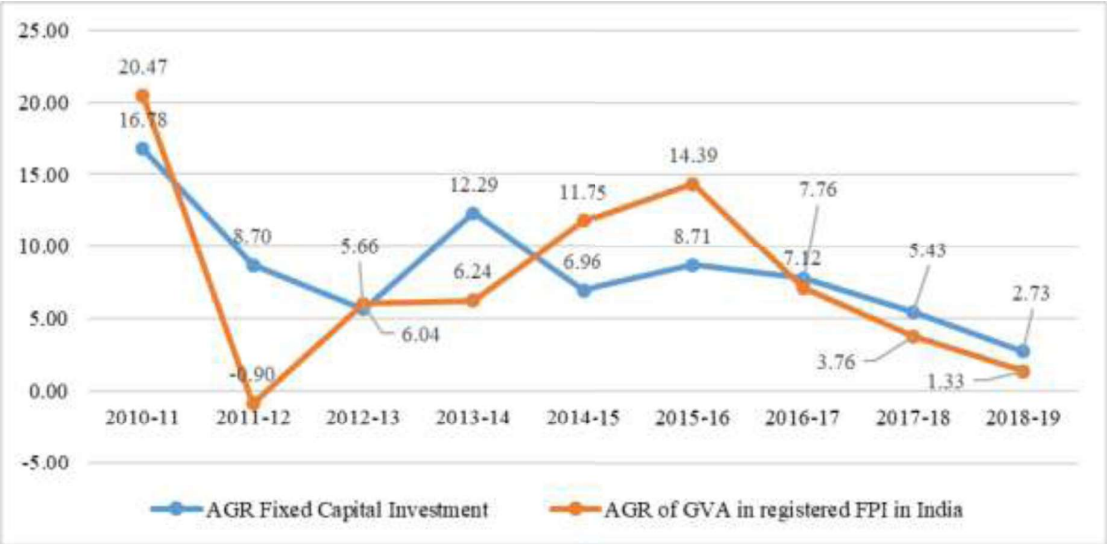


Figure 5: Compound Annual Growth Rate of GVA and Fixed Capital Investment in registered FPI

Ultimately, Fig.4 and Fig. 5 shows that both Fixed Capital Investment and GVA in registered FPIs in India are rising steadily, with Fixed Capital Investment increasing more noticeably and steadily than GVA.

3.6 State/UT-wise No. of Registered and Unincorporated Food Processing Units in India

The table presents data on registered units and unincorporated enterprises across India's states and union territories in the food and beverage manufacturing sector. Uttar Pradesh leads in unincorporated enterprises, with 350,883 units, followed by West Bengal, with 322,590 unincorporated enterprises and 2,067 registered units.

Table 4:State/UT-wise No. of Registered and Unincorporated Food Processing Units in India

Name of the State/UTs	Number of Registered Units	% Share	Number of Unincorporated Enterprises	% Share
Andaman & Nicobar	4	0.01	774	0.03
Andhra Pradesh	**5737**	**13.83**	**154330**	**6.34**
Arunachal Pradesh	29	0.07	145	0.01
Assam	1582	3.81	65,997	2.71
Bihar	896	2.16	**145300**	**5.96**
Chandigarh (U.T.)	19	0.05	656	0.03
Chhattisgarh	1761	4.25	2,975	0.12
D & N Haveli	10	0.02	622	0.03
Daman & Diu	33	0.08	136	0.01

Delhi	175	0.42	14,350	0.59
Goa	103	0.25	2,929	0.12
Gujarat	**2356**	**5.68**	94,066	3.86
Haryana	1066	2.57	24,577	1.01
Himachal Pradesh	172	0.41	21,885	0.90
Jammu & Kashmir	179	0.43	28,089	1.15
Jharkhand	237	0.57	116536	4.78
Karnataka	**2361**	**5.69**	**127458**	**5.23**
Kerala	1743	4.20	77,167	3.17
Lakshadweep	00	0.00	127	0.01
Madhya Pradesh	1018	2.45	102808	4.22
Maharashtra	**2728**	**6.58**	**229372**	**9.42**
Manipur	30	0.07	6,038	0.25
Meghalaya	32	0.08	3,268	0.13
Mizoram	29	0.07	1,538	0.06
Nagaland	20	0.05	3,642	0.15
Odisha	1211	2.92	77,781	3.19
Puducherry	68	0.16	3,482	0.14
Punjab	3267	7.88	63,626	2.61
Rajasthan	956	2.30	101666	4.17
Sikkim	19	0.05	101	0.00
Tamil Nadu	**4995**	**12.04**	**178527**	**7.33**
Telangana	**3989**	**9.62**	80,392	3.30
Tripura	117	0.28	13,998	0.57
Uttar Pradesh	**2127**	**5.13**	**350883**	**14.40**
Uttarakhand	345	0.83	18,116	0.74
West Bengal	2067	4.98	**322590**	**13.24**
Total	41481	100	2435947	100

Source: Annual Survey of Industries (2019–20) and NSSO 73rd Round (2015–16), as cited in the Annual Report 2022–23, Ministry of Food Processing Industries, Government of India.

Maharashtra leads with 229,372 unincorporated and 2,728 registered food processing units. Tamil Nadu and Andhra Pradesh also have high counts—Tamil Nadu with 4,995 registered and 178,527 unincorporated units, and Andhra Pradesh with 5,737 and 154,330, respectively. Bihar, Jharkhand, and Madhya Pradesh show large unincorporated sectors but fewer registered units. Smaller states and UTs like Sikkim, Lakshadweep, Dadra & Nagar Haveli, and Daman & Diu have minimal presence. Nationwide, there are 41,481 registered and 2,459,899 unincorporated units.

3.7 Food Exports in India from 2017 to 2022

The provided data covers agricultural and processed food exports; the data from 2017 to 2022 shows a significant increase in agri-food exports, with processed food

exports growing significantly from $5.27 billion in 2017-2018 to $10.42 billion in 2021-2022. The contribution of cereals has been dominant in the food export of India.

Table 5: India's Food Export (In US $ million)

Commodity Description	2017- 18	2018-19	2019- 20	2020- 21	2021- 22
Meat and Edible Meat Offal.	4,174.6	3,722.5	3,300.7	3,223.3	3,376.7
Fish and Crustaceans, Mollusca and other Aquatic Invertebrates.	6,850.9	6,256.9	6,159.2	5,235.4	6,903.0
Dairy Produce; Birds' Eggs; Natural Honey; Edible Prod. of Animal Origin, Not Elsewhere Spec. or Included.	366.6	538.7	353.6	351.9	619.7
Edible Vegetables and Certain Roots and Tubers.	1,305.6	1,301.7	1,095.6	1,304.5	1,486.1
Edible Fruit and Nuts; Peel or Citrus Fruit or Melons.	1,857.1	1,617.4	1,490.8	1,352.9	1,536.5
Coffee, Tea, Mate and Spices.	3,310.3	3,199.6	3,299.3	3,901.7	4,000.5
Cereals.	***8,151.6***	***8,160.2***	***6,672.4***	***10,103.5***	***12,872.7***
Products of The Milling Industry; Malt; Starches; Inulin; Wheat Gluten.	247.4	321.3	334.7	434.5	661.1
Oil Seeds and Olea. Fruits; Misc. Grains, Seeds, and Fruit; Industrial or Medicinal Plants; Straw and Fodder.	1,647.1	1,640.5	1,773.1	1,821.0	1,746.5
Lac; Gums, Resins and Other Vegetable Saps and Extracts.	1,019.0	1,056.9	822.9	727.3	943.9
Animal or Vegetable Fats and Oils and Their Cleavage Products; Pre. Edible Fats; Animal or Vegetable Waxes.	1,263.9	1,097.6	1,165.7	1,633.2	1,546.8
Preparations of Meat, of Fish or of Crustaceans, Mollusca, or other Aquatic Invertebrates	422.3	432.6	480.1	637.9	771.3
Sugars and Sugar Confectionery.	1,018.7	1,629.2	2,192.1	3,149.7	5,089.4
Cocoa and Cocoa	177.5	192.7	180.1	149.8	153.7

Preparations.					
Preparations of Cereals, Flour, Starch or Milk; Pastry cooked Products.	538.4	535.0	531.2	617.1	632.9
Preparations of Vegetables, Fruit, Nuts or other Parts of Plants.	584.9	588.5	623.6	702.7	751.6
Miscellaneous Edible Preparations.	725.9	770.2	834.5	932.9	1,105.5
Beverages, Spirits and Vinegar.	346.6	325.8	254.8	354.7	332.9
Residues and Waste from the Food Industries; Prepared Animal Fodder.	1,459.7	1,915.2	1,167.5	2,020.9	1,582.8
Agri Food Exports	35,467.9	35,302.5	32,732.0	38,654.7	46,113.3
Processed Food Exports	5,273.9	6,389.2	6,264.0	8,565.6	10,420.0
% Share of Processed Food in Food Exports	14.9%	18.1%	19.1%	22.2%	22.6%
India's Total Export	**303,526**	**330,078**	**313,361**	**394814**	**422000**
% Share of Agri Food Exports in Overall Exports	**11.7%**	**10.7%**	**10.4%**	**13.25%**	**10.93%**

Source: DGCIS, Kolkata obtained from Annual Report 2022-23, MFPI, Govt. of India.

This increased the share of processed food within total agri-food exports from 14.9% to 22.6%. However, individual commodities like cereals, sugars, and confectionery experienced fluctuations in export values. Some categories, like fish and crustaceans, experienced initial decreases and significant increases. Overall, agri-food exports as a percentage of total exports fluctuated, peaking at 13.25% in 2020-2021 and slightly dropping to 10.93% in 2021-2022.

3.8 India's Share in Global Food Trade in 2017-2021

The data outlines India's position in the global food trade from 2017 to 2021, showing a significant increase in both exports and imports. India's food exports rose from $34.42 billion in 2017 to $44.71 billion in 2021, resulting in a 2.48% increase in its share of global food exports.

Table 6: India's Share in Global Food Trade (US $ Billion)

Particulars	2017	2018	2019	2020	2021
World Food Export	1432.27	1493.35	1491.66	1535.40	1804.69
World Food Import	1449.51	1524.46	1527.49	1573.45	1852.15
India's Food Export to World	34.42	34.07	33.62	35.20	44.71
India's Food Import from World	25.09	19.60	19.18	20.37	28.71
% Share of India's Food Export inWorld	2.40%	2.28%	2.25%	2.29%	2.48%
% Share of India's Food Import inWorld	1.73%	1.29%	1.26%	1.29%	1.55%

Source: Annual Report 2022-23, MFPI, Govt. of India.

Meanwhile, India's food imports increased from $25.09 billion in 2017 to $28.71 billion in 2021. Despite these growths, India's share of global food imports remained relatively stable, growing from 1.73% to 1.55%. The data suggests that while India's food export share has slightly increased, its food import share has seen a more modest rise. Overall, the data shows that while India's food export proportion has marginally grown in the global market, its food import proportion is increasing more slowly.

3.9 Foreign Direct Investment (FDI) inflow to Food Processing Industries in India

Foreign Direct Investment (FDI) in India's food processing sector reflects rising domestic and global demand for processed foods. FDI involves international capital inflow to enhance production capacity (Shelly, 2015). The Indian government permits 100% FDI under the automatic route, except for items reserved for micro and small enterprises. In retail trading, 100% FDI is allowed with government approval for food products manufactured or produced in India. Over the past decade, the sector—one of India's top 10 FDI recipients—has attracted around USD 11 billion. In 2022–2023 alone, FDI inflows reached approximately USD 700 million.

The line graph (2014–15 to 2022–23) shows fluctuating FDI in India's food processing sector. It rose from ₹3,164.72 crores in 2014–15 to a peak of ₹6,414.67 crores in 2019–20, dropped sharply to ₹1,670.37 crores in 2020–21 due to COVID-19, recovered in 2021–22, then declined again in early 2022–23.

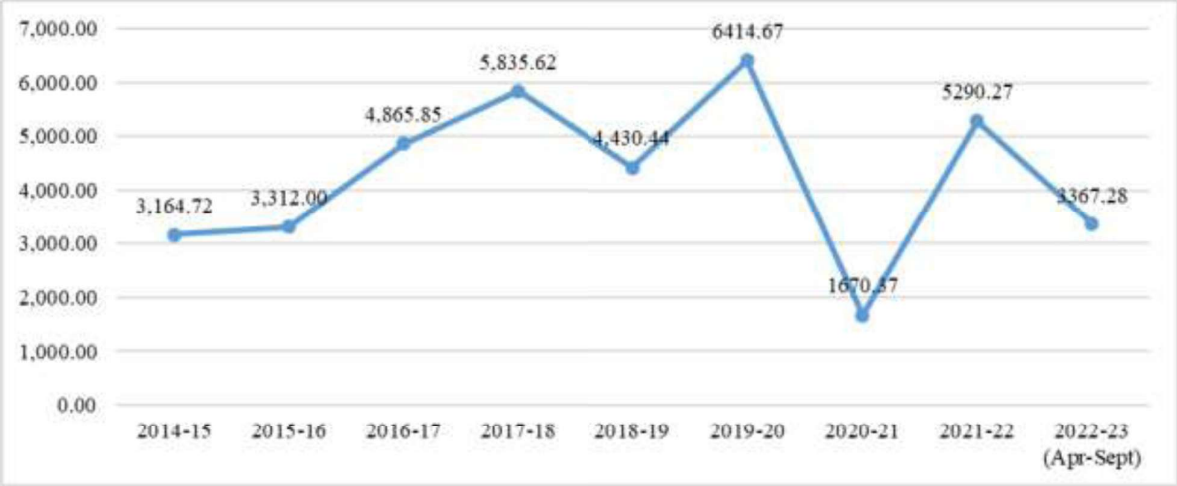


Figure 6: FDI Equity inflow to FPI

Major firms like Nestlé, Coca-Cola, PepsiCo, Unilever, and Cargill have invested significantly. Government initiatives such as the Pradhan Mantri Kisan Sampada Yojana, Make in India, Mega Food Parks, and agri-export zones have encouraged FDI, supported by rising incomes, changing food habits, organized retail, and demand for ready-to-eat products.

1. Conclusion and Suggestions

India's food processing industry plays a vital role in economic development by adding value, reducing post-harvest losses, and improving agricultural efficiency. The sector has seen significant growth due to rising consumer demand for processed foods and strong government support. Programs such as PMKSY, Mega Food Parks, and the Production Linked Incentive (PLI) scheme have accelerated development. With substantial domestic and foreign investments, including over ₹20,000 crore through government initiatives, the sector is poised for further expansion.

To enhance its potential, several strategic measures are recommended:

- Adopt technologies like IoT, AI, and blockchain for efficient supply chain management and traceability.
- Increase investment in cold storage and logistics to reduce post-harvest losses and improve perishable product quality.
- Promote research and development to improve product quality, safety, and shelf life.
- Strengthen linkages among farmers, processors, and retailers to streamline operations and reduce costs.
- Encourage sustainable practices, including energy-efficient machinery and waste recycling.
- Offer financial support for technology upgrades, infrastructure, and skill development.
- Improve credit access for MSMEs in the sector.
- Support export-oriented units with market insights, trade facilitation, and incentives.

- Expand distribution networks and marketing to serve the growing domestic market.

These steps will strengthen food processing and enhance agricultural value addition.

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