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Agriculture Processing and Its Barriers to Growth in Indian context

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Abstract— *This research paper identify the growth barriers at different stages in the food supply chain. A comprehensive literature study covered three supply chain tiers that is- the farm level, the distribution level, and the consumer level. In addition, the barriers are focused and prioritised also their relative relevance is highlighted. The results show that the primary barriers to IFPS expansion are rain-dependent farming, the high cost of cold chain facilities, Lack of Modern Infrastructure, and the inconsistent and low-quality processed food.*

Keywords— ***Food Supply Chain Growth Barriers, Supply Chain Tiers, Rain-Dependent Farming, Cold Chain Facilities, Processed Food Quality***

I. INTRODUCTION

Globally, India is the top producer of milk, pulses, bananas, papayas, mangoes, ginger, and buffalo meat. But overall, only 10% of perishable goods are processed, which severely restricts processing capacity in comparison to other countries. The Indian food processing sector (IFPS) is less productive overall than the global food processing supply chains, even with the benefit of favourable agro-climatic conditions. For example, India's processed food exports as a percentage of GDP are only 2%, a significant difference from Brazil, Argentina, and Thailand.

Moreover, The IFPS may be facing its greatest obstacles in the form of supply chain (SC) gaps and losses. In the IFPS, losses happen at the farm, distribution, and consumer levels, among other levels. This has become a serious global issue, according to Shankar et al., because between 40 and 50 percent of the world's fruits, vegetables, and root crops are destroyed before being consumed. By decreasing food loss, increasing product shelf life, and improving productivity, the food processing industry can play a significant role. All parties involved will benefit from this if all supply chain stakeholders are involved and the supply chain is optimised from start to finish.

Value-added processed food and processed food are the two main categories into which the food processing industry is typically separated. Milk, flour, rice, pulses, spices, fruits, vegetables, and salt are all included in the first category and can be purchased packed or unpacked. These products' shelf lives range from short to medium, depending on how they are stored and the weather at various points in the supply chain. Contamination and waste are two of the challenges this category faces, especially with offered products that aren't wrapped. The second category includes processed foods including chocolates, dairy, chicken, pickles, juices, jams, and processed fruits and vegetables. These food products are usually prepared with both natural and artificial food preservatives before being packaged and given a lengthy shelflife.

Objective of the Study:

To gain knowledge about the current status of food processing industry in India. To identify the major growth indicators of food processing industry in India.

To identify the major effects of pandemic covid-19 on food processing.

To identify the challenges and barriers of food processing market in India

Research Methodology:

This research study is mainly based on secondary data information. The relevant material and secondary data were collected from various sources, official and unofficial both sources. Researcher go through many research articles and research papers to find the status of food processing system in India.

II. LITERATURE REVIEW

Thulasiraman raised the issues in the food processing sectors during the pandemic like Covid- 19 and also questioned that how to manage the short supply of food during pandemic. Also maintain the right balance between food chain supply and food processing sectors. He pointed the issues and problems of food processing industries and the supplying raw material under lockdown period.

Chitrakar identified the major role of information technologies in food processing industries during a pandemic period.

Murthy and Yogesh(2014) identified the challenges and opportunities in the IFSP. In addition *Mr. Singh* also identified the issues and challenges in IFPS. As per their study's findings ethical and traditional practices and the information technology should be promoted to increase the sustainability in food processing. It helps in decision making in the supply chain and its connectivity to everyone.

Das & Biswas explained the role of the food processing sector and it's contribute in the Indian economy and presented the role of IFSP in the future.

Shelly & Kaur also explore the role of IFPS in employment and economic growth. They suggested that an increase in foreign direct investment, and globally participation promotes the new opportunities to develop the IFPS in country.

Functions of Indian Food Processing System:

The Indian food processing system plays a crucial role in transforming raw food materials into various value-added products. It encompasses a wide range of activities and functions aimed at enhancing the quality, safety, and shelf life of food products. There are some key functions of Indian Food Processing System:

Preservation: Food processing helps in preserving perishable food items by methods like canning, freezing, drying, and pickling, which extend their shelf life and reduce foodwastage.

Nutrient Retention: Processing techniques are designed to retain the nutritional value of food while making it more accessible and convenient for consumption.

Value Addition: Value-added processing involves enhancing the appeal, taste, and quality of food products. This can include adding flavours, spices, and other ingredients to createunique products.

Convenience: The food processing industry manufactures ready-to-eat and ready-to-cook products, making it more convenient for consumers to prepare meals quickly.

Packaging: Proper packaging materials and techniques help maintain the quality and safety of processed foods, extending their shelf life and protecting them from contamination.

Quality Control: Quality assurance and quality control processes ensure that processed foods meet safety and quality standards. This includes inspections, testing, and adherence to regulatory guidelines.

Standardization: Standardized processes and recipes are crucial for consistency in taste, texture, and quality of processed foods.

Distribution and Supply Chain Management: The food processing industry plays a critical role in the efficient distribution and supply chain management of food products, ensuring their availability and accessibility to consumers.

Food Safety and Hygiene: Maintaining high food safety and hygiene standards is essential to prevent foodborne illnesses and ensure the safety of consumers.

Export: The food processing sector facilitates the export of Indian food products to international markets, contributing to the country's economy and promoting Indian cuisine globally.

Job Creation: The food processing industry generates employment opportunities for a diverse workforce, from agricultural production to manufacturing and distribution.

Waste Reduction: By using surplus or less visually appealing produce, food processing can help reduce food waste and utilize more of the harvest.

Innovation: The industry encourages innovation in product development, leading to the creation of new food products, flavours, and packaging innovations.

R&D and Product Development: Investment in research and development allows for the creation of healthier, more sustainable, and technologically advanced food products.

Rural Development: The food processing sector can stimulate economic growth in rural areas by providing processing facilities and employment opportunities for local communities.

Infrastructure Development: To support the food processing industry, infrastructure such as cold storage, processing units, and transportation networks are developed and improved.

Marketing and Branding: Promoting Indian food products through effective marketing and branding strategies can help expand their reach both domestically and internationally.

Overall, the Indian food processing system plays a pivotal role in enhancing food security, promoting economic

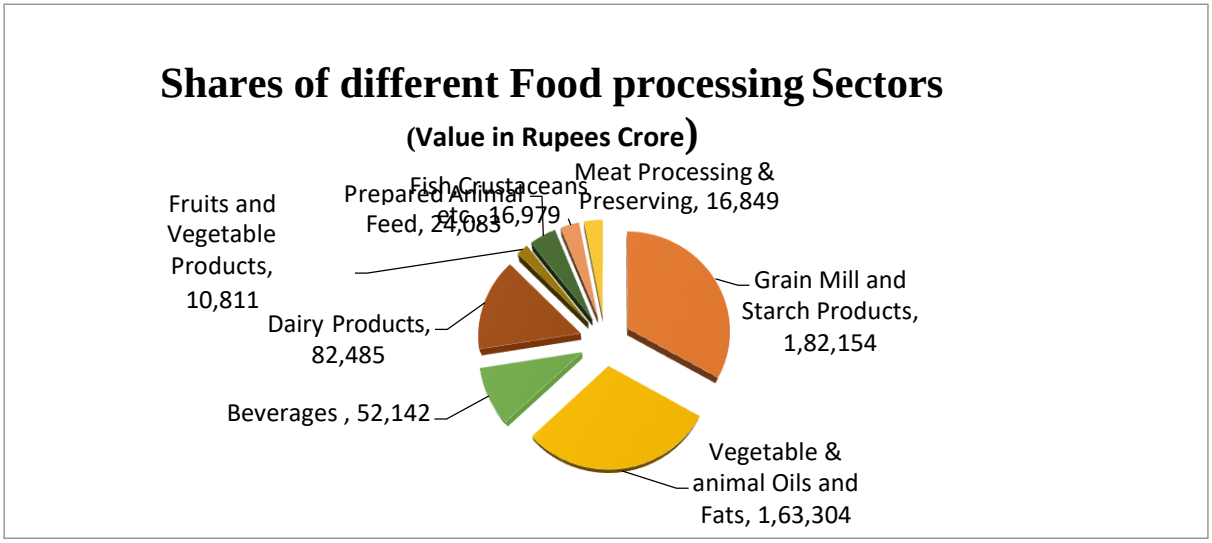
growth, and meeting the diverse food preferences and demands of consumers in India and around the world.

Present Status of Food Processing Industry in India:

India is a vast country that takes up almost 2.4% of the territory in the world. According to the Ministry of Finance (2015), India has 127 agro climatic zones, 195.25 million hectares of gross cropped area, 62.26 million hectares of net irrigated area, and 195.25 million hectares of total irrigated area. Agriculture is an area where India has a great deal of untapped potential. This is one of the primary reasons why the food industry in India has access to such a large base of raw materials.

The term "food industry" refers to a very broad category of businesses in India. These businesses include agriculture, horticulture, animal husbandry, plantation crops, and fisheries. Food Processing Industries Ministry Government of India categorises the food processing into following:

- Dairy, fruits and vegetable processing
- Grain processing
- Meat and poultry processing
- Fisheries
- Consumer foods including packaged food, beverages and packaged drinking water.



Source: Ministry of Food Processing Industries, Annual Report, (2014-2015)

The food processing industry is an important contributor to the GDP of the country. The mentioned fact is evident from the table given below. From the table this can also be seen that the food processing sector is growing faster than agriculture sector.

III. BARRIERS TO GROWTH IN INDIAN FOOD PROCESSING

Agriculture processing in India faces several challenges that affect the efficiency and productivity of this sector. Some of the key problems include:

Lack of Modern Infrastructure: Outdated and inadequate infrastructure for food processing, including storage facilities, transportation, and processing units, results in significant post- harvest losses.

Inefficient Supply Chain: The supply chain in India is highly fragmented and inefficient. This results in a significant amount of food wastage, especially for perishable products.

Quality and Safety Concerns: Many food processing units in India do not meet international standards for quality and safety. This can limit export opportunities and consumer trust.

Inadequate Research and Development: Limited investment in research and development hampers the development of new technologies and innovative products in the food processing industry.

Lack of Skilled Labor: The sector often suffers from a shortage of skilled labor and technical expertise. This can lead to inefficiencies and quality control issues.

Regulatory and Compliance Challenges: Complex regulations and compliance issues can make it challenging for food processing businesses to operate and expand. This includes issues related to licensing, labelling, and quality standards.

Limited Access to Credit and Finance: Many small and

medium-sized enterprises in the food processing sector struggle to access affordable credit and financing options, which can hinder their growth and expansion.

Market Access and Export Barriers: While there's a growing demand for Indian agricultural products globally, trade barriers, tariffs, and sanitary and phytosanitary standards in international markets can make it difficult for Indian producers to export their processed goods.

Fragmented Agriculture Sector: India has a highly fragmented agriculture sector, with a large number of small and marginal farmers. Coordinating with and sourcing from such a fragmented sector can be challenging for food processors.

Seasonal and Cyclical Nature of Agriculture: The food processing industry often faces challenges related to seasonality and the cyclical nature of agriculture. The availability of raw materials can fluctuate significantly.

Energy Costs: Rising energy costs can affect the viability of food processing units. Many units rely on electricity, and fluctuations in energy prices can impact production costs.

Environmental Concerns: Environmental sustainability is becoming an increasingly important concern in food processing. Reducing waste and adopting eco-friendly practices can be expensive and challenging.

Technology Adoption: Limited adoption of advanced technologies and automation in food processing can limit productivity and hinder cost-efficiency.

Addressing these challenges requires a comprehensive approach involving investments in infrastructure, research and development, skill development, and policy reforms to encourage growth and competitiveness in India's agriculture processing sector.

Table: Contribution of Food Processing Industry to GDP @ 2004-05 Prices (Rs.in Crore)

S. No	Description	2008-09	2009-10	2010-11	2011-12	2012-13	
	GDP at Factor Cost, of which	41,58,676	45,16,071	49,18,533	52,47,530	54,82,111	
	GDP-Agriculture*	5,88,757	5,92,110	6,47,305	6,82,016	6,90,646	
	GDP-Manufacturing	6,56,302	7,30,435	7,95,152	8,54,098	8,63,876	
	GDP-FPI	60,378	58,752	67,508	82,063	84,522	
	Growth (%)						**AAGR****
	GDP at Factor Cost	6.7	8.6	8.9	6.7	4.5	7.1
	GDP-Agriculture*	-0.1	0.6	9.3	5.4	1.3	3.3
	GDP-Manufacturing	4.3	11.3	8.9	7.4	1.1	6.6
	GDP-FPI	5.3	-2.7	14.9	21.6	3.0	8.4
	Share of FPI in GDP (%)						**Average**
	GDP FPI as a share of GDP in Agriculture*	10.3	9.9	10.4	12.0	12.2	11.0
	GDP FPI as a share of GDP in Manufacturing	9.2	8.0	8.5	9.6	9.8	9.0

Source: MOFPI Annual Report, 2014-15: *Excludes Forestry and Logging: **Five Year Average Annual Growth Rate

Covid-19 and its Effects in Food Processing in India:

The COVID-19 pandemic, caused by the novel coronavirus SARS-CoV-2, has had far-reaching effects on societies, economies, and industries worldwide. Among the sectors significantly impacted is agriculture and food processing. This essay examines the pandemic's effects on these vital sectors, highlighting challenges faced and opportunities for resilience and adaptation.The agriculture and food processing industries were severely disrupted by the pandemic due to lockdowns, social distancing measures,

and restrictions on movement. These disruptions primarily affected the supply chain:Social distancing and lockdowns restricted the movement of farmworkers and processing plant employees. Many farms and food processing facilities struggled to maintain their workforce, leading to labor shortages during critical planting and harvesting seasons.The closure of restaurants, schools, and other foodservice outlets led to reduced demand for certain food products. As a result, some farmers struggled to sell their produce, leading to income losses. Food processing facilities had to implement strict health and safety measures to protect workers from COVID-19. These measures included increased sanitation, personal protective equipment, and social distancing, which led to operational inefficiencies.

The COVID-19 pandemic has presented unprecedented challenges for the agriculture and food processing sectors, affecting the supply chain, labor force, and financial stability. However, it has also stimulated resilience and innovation within these industries. As the world moves forward, lessons learned from the pandemic should guide future efforts to enhance food system sustainability, resilience, and adaptability in the face of unexpected disruptions. This could involve further investment in technology, improved supply chain management, and continued support for local and sustainable food systems.

CONCLUSION

In conclusion, the food processing industry faces a range of barriers and challenges, from regulatory compliance and food safety concerns to economic factors and technological advancements. Overcoming these obstacles requires innovation, adaptability, and a commitment to quality and safety. Companies that successfully navigate these challenges can thrive in a rapidly changing industry. And removing food processing barriers is an ongoing process that requires a commitment to quality, safety, and efficiency. It often involves a combination of technological upgrades, regulatory compliance, and a culture of continuous improvement. Here are some steps to consider: Identify the Barriers, Invest in Modern Equipment, Ensure Food Safety, Optimize Supply Chain, and Minimize food waste by optimizing your processes, Invest in Research and Development, Employee Training and Engagement.

However, because of their inelastic demand, food items have seen a relatively constant global demand. Because emerging and less developed nations are less insulated from global shocks or pandemics, their supply chain stability and food security have been significantly worse even at the global level. Notably, these nations' extreme reliance on technology, lack of accessibility for various reasons, and technological backwardness all contribute to poverty and food insecurity. A comprehensive strategy aimed at the developing and less developed economies is strongly recommended at the policy level in order to guarantee 3 7 10 a noticeable advancement in the reduction of sensitivity concerning food security and agriculture. Food safety and quality are currently the world's most pressing issues

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