

An Insight into the Indian Agro and Food Processing Industry

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Abstract

One Indian out of every two is thought to be dependent on agriculture for a living in India. India has around 52% of the arable land area as compared to 11% globally. A fresh strategy and technology is required to aid the new green revolution, given how drastically the agricultural landscape has changed. Even though agriculture is the primary source of income for the vast majority of people, there is still an equal amount of unemployed people because of low productivity. However, over the past few decades, the agro-food industry has grown quickly to become an organized sector with a promising future in socio-economic development of the nation. Our paper aims to provide insight into the current state and evolution of this industry in India, taking into account the government's reforms, subsidies, incentives, technological advancement, R&D, export potential, growth trajectory, limitations, and competition, among other factors. On the basis of which, we suggest developing an industry-focused action plan to promote the development and growth of the industry and the individuals associated with it.

Key words: Entrepreneurship; Food Processing; Competitive Analysis; Agriculture development.

I. INTRODUCTION

An all-encompassing term is "agro-industry." It could include a range of manufacturing, processing, and industrial operations based on agricultural raw materials.

Inputs to agriculture include both materials and activities and services. The majority of states'

agro-industries corporations, established in the 1960s, have mostly been involved in providing farmers with agricultural equipment, fertilizer, seeds, and other contemporary inputs.

Food processing industry in India is a sunrise sector that has gained prominence over the recent years. Availability of raw materials, changing lifestyles and appropriate fiscal policies has given a considerable push to the industry's growth. This sector serves as a vital link between the agriculture and industrial segments of the economy. Adequate focus on this sector could greatly alleviate our concerns on food security and food inflation. Strengthening this connection is essential to reducing wastage of agricultural raw materials, increasing the shelf life of agricultural produce and enhancing its nutritional value, ensuring fair prices for farmers and consumers, and improving the value of agricultural production. India already ranks highly among countries that export various food items. The Ministry of Food Processing Industries is executing a range of programmes for infrastructure development, technical up-gradation & modernization, human resources development, and R&D in the Food Processing Sector to ensure that this sector receives the stimulus it deserves.

II. SCOPE OF THE STUDY

Due to the country's heavy reliance on agriculture, the potential for agro-based companies in India is rather considerable. In India, the agricultural sector contributes roughly 18% of GDP, according to statistics for the year 2020. Additionally, the agricultural sector alone employs 42% of the Indian population. Because of a variety of factors, the percentage of the population employed in the agriculture industry has been decreasing every year. The bulk of the population still works in it, making it the largest sector.

Agro-based business is recognized as the Indian economy's "sunrise sector" due to its enormous development potential, socioeconomic impact, particularly on employment and income production, and general ability to remain recession-proof. Agro-based industries and agriculture also support about 70% of the population. Agro-based sectors in India saw constant growth from 2009–10 to 2013–14, according to the Central Statistics Office's economic survey 2014–15. According to some estimates, the agro-processing industry employs over 14% of the labour force in developed countries while only 3% of the workforce in India is employed in this industry. The information mentioned above highlights the underdeveloped state and enormous potential of the sector.

III. OBJECTIVE

1. To assess the current state of the agricultural business in India.
2. To assess the potential of the Industry, listing out the drivers for the growth.
3. To highlight the action strategies and technology in particular for the development of the

agro processing sector

4. To present the issues and challenges faced with the ideas and solutions to overcome.

IV. RESEARCH METHODOLOGY

The research is based on secondary information and is qualitative in nature. Secondary data is gathered from numerous journals, publications, and websites to report on the presence and the growth of the different agricultural businesses in India with the assessment on the potential of the Industry, listing out the drivers for the growth. The research attempts to investigate and present a report on the strategies and technology in particular for the development of the agro processing sector. Detailed review and deep study has helped us to highlight the action strategies; technology in particular for the development of the agro processing sector

V. GENESIS OF AGRICULTURE:

The advent of "agriculture" or "agro" heralds the start of "civilized" or "sedentary" society. During the Holocene Era (10,000 BC and later), climate change and population growth influenced the development of agriculture. Domestication of plants and animals during the Bronze Age (9000 BC) changed the early Homo sapiens' occupation from hunting and gathering to selective hunting, herding, and eventually settled agriculture. Agriculture eventually made it possible for people to build permanent settlements and grow urban societies. Around 7000 BC, cultivation marked the change from nomadic prehistoric societies to the sedentary Neolithic way of life.

The Sumerians, beginning around 5,500 BC, would be considered the "inventors of agriculture" according to the contemporary definition of the term, which is "an aggregate of large scale intensive cultivation of land, mono-cropping, systematic irrigation, and use of a specialized work force." The moldboard plough and the three-field crop rotation system were both innovations of the Renaissance. New agricultural techniques like enclosure, mechanization, four-field crop rotation, and selective breeding were implemented during the early stages of the Industrial Revolution. The mechanization of agriculture, i.e., the use of tractors, resulted from the science-driven advances of the 19th and 20th centuries.

VI. THE GREEN REVOLUTION IN INDIA

Nearly two thirds of the workforce in India, the world's largest economy, depends on agriculture for their livelihood. No less crucial than industry and services in recent years has been the contribution of agriculture and related sectors to India's economic growth.

The phrase "If agriculture survives, India survives" perfectly captures the significance of the industry to the nation.

In order to address concerns about national independence, security, and political stability, policymakers and planners concluded that self-sufficiency in food production was a crucial requirement. This idea gave rise to the Intensive Agriculture District Programme an agricultural reform scheme, and ultimately to the Green Revolution. It was decided to establish the National Bank for Agriculture and Rural Development .The yield and production of crops increased dramatically as a result of all these procedures.

VII. TYPES OF AGRO BASED INDUSTRIES

- **Agro-produce processing units:** These units don't engage in manufacturing; instead, they focus on by-product use and the preservation of perishable goods. These kinds of facilities include rice and dal processing mills.
- **Agro-produce manufacturing facilities:** These facilities create new items from raw materials that are entirely distinct from the final products. Examples of these types of units are sugar factories, solvent extraction facilities, and textile mills.
- **Agro-inputs manufacturing units:** These facilities manufacture goods that are either used to mechanise agriculture or to boost agricultural output. Manufacturing facilities for agricultural tools, seeds, fertiliser, and pesticides are a few examples of these units.
- **Agro Service Centres:** Pump sets, diesel engines, tractors, and other pieces of farm machinery are repaired and serviced at agro service centres, which are shops and service facilities.

INDIA'S NOTABLE AGRO-BASED INDUSTRIES

- **TEXTILE INDUSTRY**

The design, manufacture, distribution, or marketing of yarn, textiles, or ready-made clothes are all aspects of the textile industry. It consists of factories that produce jute, silk, synthetic fibres, and cotton, wool, and woolen textiles.

Being the second-largest employer in India after agriculture, the industry is crucial to the country's economy. Additionally, it directly and indirectly employs about 10.5 crore people. India is also the world's second-largest producer and exporter of textiles and apparel,

accounting for 5% of all international trade. In 2018–19, it made up 12% of all exports from India.

The two biggest export markets for Indian textiles are the US and the EU, followed by a number of Asian nations and the Middle East.

India's textile and apparel market, which had a 2015 value of US\$108.5 billion, is anticipated to rise to US\$226 billion by 2023, with a CAGR of 8.7% from 2009 to 2023.

- **SUGAR INDUSTRY**

The provision of sugar, which is regarded as a necessary component of the human diet, is the responsibility of the sugar business.

In terms of sugar production for 2019–20, India slipped to second place after barely losing the top spot to Brazil. India produced 28.9 million metric tonnes of sugar, or nearly 17% of the 166.18 million metric tonnes of sugar produced worldwide.

The current yearly output of the sugar industry is around INR 80,000 crores. In 2020–21, sugar production is anticipated to increase by 17%, while domestic consumption is anticipated to reach a new high of 28.5 million

- **VEGETABLE INDUSTRY**

Around 5% of the vegetable oil produced worldwide is produced by the Indian sector.

The world's greatest user of edible oils is India. Around 23 million tonnes of vegetable oil are thought to be consumed domestically each year, with imports largely meeting this demand. Additionally, with an annual import of 15 million tonnes, or about 14% of all vegetable oil imports worldwide, India is currently the world's largest importer of edible oils. The industry holds a unique place in the Indian economy since it creates chances for employment for millions of people, generates an average domestic turnover of USD 10 billion annually, and earns USD 90 million in foreign exchange annually. Due to escalating local demand and exports, the processing of vegetable oils will continue to be one of India's greatest industrial sectors.

- **TEA INDUSTRY:**

After water, tea is the beverage that people drink the most in the world. Global tea production increased at a CAGR of 2.97% between 2014 and 2018.

With a total production of 1,339.70 million kg in 2019, India was the second-largest tea producer in the world. Additionally, with about three-fourths of the world's total production

being consumed locally, India is one of the largest consumers of tea.

Because it employs more than 2 million people overall, the tea sector is unique in the Indian economy.

With exports of USD 830.90 million in FY 2019 and USD 826.47 million in FY 2020, the sector also generates crucial foreign cash for the nation. The Indian tea sector has always experienced tremendous expansion. Based on current production levels, a CAGR of 2.65% is predicted for the period between 2019 and 25 for the world tea output.

In India, production and consumption of tea are anticipated to rise at a CAGR of 2.25 and 2.88%, respectively, between 2019 and 25. Additionally, a CAGR of 6.23% is predicted for the tea industry's revenue earnings between 2019 and 25.

The Indian Tea Association has asked the Union Government to take care of the rising costs, stagnant pricing, take over the workers' PF contribution for a period of three years, and establish additional measures in order to bring relief to the Indian tea business in light of the aforementioned.

- **COFFE INDUSTRY**

India has traditionally been a tea-loving nation, but over the past two decades, we have seen an unprecedented increase in the number of coffee drinkers due to factors including (i) rising disposable incomes (coffee is considered to be more expensive than tea), (ii) increased global exposure, (iii) the uptake of digital media, and (iv) changing lifestyles, among others.

The rise in coffee consumption sparked a cafe culture in India and led to the establishment of multiple shops for well-known brands like Starbucks, Costa Coffee, and Cafe Coffee Day.

India is the world's fifth-largest exporter and sixth-largest producer of coffee. In 2019–20, there were 2,99,300 million tonnes of coffee produced, or 3.14% of all coffee produced worldwide. India will export USD 738.90 million worth of coffee in 2019–20, or 70% of domestic production. In 2018–19, Italy (21.63%), Germany (9%), the Russian Federation (6.3%), Belgium (5.24%), and Turkey (4.17%) were the top 5 countries importing Indian coffee.

Because it employs over a million people directly and indirectly and generates about 4,000 crores in foreign exchange, the coffee industry plays a significant role in the Indian economy.

- **LEATHER INDUSRTY**

One of the most traded commodities worldwide is feather. The fashion, furniture, interior design, and automobile industries all boost the demand for leather. 12.93% of the world's leather hides and skins are produced by the Indian leather industry. Additionally, India exported \$5.07

billion worth of leather and leather-related goods in 2019–20. USA (17.22%), Germany (11.98%), UK (10.43%), Italy (6.33%), and France (5.94%) were India's top export destinations. Because it employs 4.42 million people, the industry plays a significant role in the Indian economy. It is also one of the top 10 sources of foreign exchange earnings for the nation. The industrial base of the global leather industry is currently being shifted from developed to developing countries. As a result, there are more job possibilities and foreign direct investment coming into India. The industry has been designated as one of the 12 target sectors by the Union Government due to its potential for growth. It has implemented a number of efforts to support the expansion of the Indian leather goods industry.

VIII. AGRO-BASED INDUSTRY'S POTENTIAL

The livelihoods of the population that depends on agriculture, especially the producing sector that has strong backward and forward links with agriculture, can suffer severe consequences if agricultural growth is uneven and decelerating. Similar to other sorts of agribusinesses, the liberalized food-producing sectors may be crucial in promoting agricultural growth. Food production is one of many agro-industries that use a lot of resources; as a result, it has a lot of potential to revive agricultural growth by enhancing forward and backward connections with farmers and accelerating the method of exploitation and diversification of agricultural production. Additionally, food processing businesses often locate themselves closer to the source of their raw materials in order to lower their transaction prices. This creates opportunities for rural residents to make money. Therefore, a major policy issue could be achieving rapid agricultural growth through diversification and the increase of agro-processing.

With 44% of the workforce employed in agriculture and a GDP contribution of 16% to India, it plays a significant role in the development of the country's economy. Even while the sector as a whole is expanding, stress from decreased favorable inputs is developing. Despite being a leading producer and exporter of a number of agricultural commodities and having an agrarian economy, India faces numerous difficulties that prevent the sector from operating at its full potential, including a high reliance on the weather, inefficient supply chains, resource depletion, and low productivity

IX. DRIVERS OF THE INDIAN FOOD PROCESSING MARKET

Consumers now lead a fast-paced and hectic lifestyle as a result of continuous urban population growth and rising employment rates. Because cooking and meal preparation take up a lot of time, processed meals like ready-to-eat dishes and snacks have grown in popularity, especially

in urban areas.

One of the greatest working populations in the world is found in India. This group might be regarded as the largest consumer of processed foods due to rising disposable incomes. For the next five years, we anticipate that this population will continue to increase.

Customers have a variety of options thanks to the organized food retail outlets' growing market share. Consumers have access to a wide variety of goods at organized retail locations together with alluring discounts.

Both in urban and rural regions, the percentage of working women has been steadily rising. The quantity of time for domestic tasks like cooking is dwindling as a result of their hectic lifestyle. As a result, the demand for processed and ready-to-eat foods is increasing.

- Millets are now consumed at home in greater quantities, with monthly consumption per person rising to 14 kg from 3 kg and sales increasing by over 30%.
- Sh. Rupala opened the Camel Product Processing Utilisation & Training Wing at the ICAR-National Research Centre, boosting the pastoralist community.
- Union Budget 2023–24: The funding allotted to the Department of Fisheries in Budget FY 2023–24 represents a general increase of 38.45% over Budget FY 2022–23.
- Sugar exports rose overall in 2022 thanks to a 15% gain in unit value, and this upward trend is anticipated to continue in 2023 as well.
- The Legal Metrology (Packaged Commodities) Regulations 2011 are amended by the Center to make doing business easier and less onerous for the electronic industry.
- The spread of low GI rice varieties will halt or even reverse India's rising diabetes rate because the majority of rice types are high in GI and the majority of Indians eat rice.
- The Platform of Platforms (POP) under the National Agricultural Market was introduced by Shri Narendra Singh Tomar (e-NAM). In order to improve the price search process and quality commensurate price realisation, this will boost farmers' digital access to a wider range of markets, buyers, and service providers.
- APEDA and Assam Agriculture University, Jorhat sign a Memorandum of Understanding to conduct various training programmes on pre-harvest, post-harvest, and other research activities.

- POP covers 41 service providers from multiple platforms who provide a range of value chain services, such as trade, quality assurance, warehousing, fintech, market intelligence, transportation, etc.
- The change to the export rules for wheat or meslin flour is approved by the cabinet.
- The Animal Husbandry Infrastructure Development Fund (AHIDF) projects are started to help the farmers. * The Credit Guarantee Online Portal and five major plants setup are opened with the help of the AHIDF scheme to focus on wealth creation in rural areas rather than just poverty alleviation and increasing farmer income. *
- The Legal Metrology (Packaged Commodities), (Second Amendment) Regulations 2022 from the Department of Consumer Affairs permit electronic products to make some required declarations via the QR Code for a period of one year if they are not made on the package itself.
- The government of India wants to cultivate 28 lakh hectares of land in order to produce edible oil for Aatmanirbhar. * The Pradhan Mantri Krishi Sinchayee Yojana is approved by the Cabinet for implementation from 2021 to 2026. * The Government of India has authorised an INR 463 crore, five-year project titled "Innovative Extension Methods for Revitalising Agriculture in J&K."
- The Government of India (GOI) has released rules to make drone technology accessible to the sector's stakeholders, which will significantly help to improve precision farming in India. *
- India is one of the top 10 exporters of agricultural goods. For the next five years, India wants to quadruple its marine product exports from their current level of around INR 50,000 crore to INR One lakh crore, placing it among the top five exporters of agricultural products.
- Sugar mills have 60 days from the date the order was issued to determine whether to partially or entirely relinquish their export quotas or to swap them out for domestic quotas in order to speed up sugar exports and maintain flexibility. The switching method would lessen the demand for moving sugar throughout the country for domestic use as well as moving sugar from far-off places to the ports for exports.
- 10,000 new FPOs worth INR 6,865 crore have been established to boost farmer income, while INR 11,000 crore has been set aside to lessen reliance on the import of edible oils.

X. ACTION STRATEGIES FOR THE DEVELOPMENT OF THE AGRO PROCESSING SECTOR:

Following liberalization, a number of policy decisions were made on regulation, control, export and import, fiscal policy, exchange rate and interest rate management, taxation, export promotion, and incentives for high priority industries. High focus has been given to the food

processing and agricultural businesses, and there are numerous significant reliefs and incentives.

Every policy initiative has had as its goal to increase the competitiveness of Indian agriculture by giving it the capacity to manufacture goods of equivalent quality around the world at comparable costs. Some of the significant policy reforms towards the food processing industry are as follows.

REGULATION AND MANAGEMENT

- The majority of processed food products are free from licensing requirements under the Industries, Development and Regulation, Act of 1951, with the exception of those designated for the small-scale industry and alcoholic drinks.
- According to policy, up to 100% of foreign direct investment is allowed via the automatic route in the food infrastructure, such as food parks, cold chains, and warehousing.
- The FDI policy does not allow FDI into the retail sector for food, with the exception of Single Brand Product Retailing.
- This rule applies to all retailing activities.
- A distinct dispensation for products in the food processing sector is not anticipated, and the FDI policy for production of items reserved for the small scale industry sector is identical for all of the items so reserved.
- According to the distillation policy that has been announced, FDI up to 100% is allowed on the automated route.
- For the production of alcohol through distillation and brewing, subject to license by the relevant authority.
- The government now openly permits the use of international brand names.
- The Foreign Exchange Regulation Act (FERA) and MRTP (Monopolies and Restrictive Trade Practices Act) laws have been loosened and given more latitude to attract large corporations to invest and grow.

XI. AGRICULTURAL PROCESSING SECTOR TECHNOLOGICAL

ADVANCEMENTS:

According to a study by R. P. Kachru, assistant director general (Process Engineering), Indian Council of Agricultural Research, New Delhi, India has conducted the following types of agro processing R&D work over the past 50 years:

- Studies on the engineering, physical, biological, nutritional, and features of various food, feed, fiber, and industrial raw materials.
- Response analyses of various biological materials in relation to their handling, storage, and moisture conditioning.
- Improvements to conventional machinery and procedures for the production of various meals, feeds, fibers, and fuel materials to improve quality, capacity, energy efficiency, and worker comfort.
- Refinement of conventional machinery and procedures for the production of various meals, feeds, fibers, and fuel materials to improve quality, capacity, energy efficiency, and worker comfort.
- The creation of novel products and procedures for improved nutrition, practicality, and flavor. Extension of produce's shelf life, creation of better performance materials, and safe storage and packaging.
- Improved recycling of wastes and better economic use of agricultural byproducts and residues.
- Instrument and equipment design and development, evaluation, feasibility studies, field trials, multi-location evaluation, etc. for post-harvest operations.
- The design, layout planning, and development of pilot plants, bulk handling systems for agricultural produce, and region-specific agro processing models.
- For the purposes of forecasting, policy analysis, and optimization, studies and modeling/simulation of post-harvest systems and industries are conducted.
- Energy audits and the use of non-renewable energy sources for post-harvest activities.
- Product quality analysis, sensory evaluation, and customer acceptability studies on work conditions, safety, and pollution control.

VII. THE MOST WIDELY USED TECHNOLOGY AMONG THE MANY THAT HAVE BEEN DEVELOPED IS AS FOLLOWS:

1. Equipment for repurposing agricultural produce, including cleaners, graders, and dryers for both industrial and domestic use.
2. Methods and tools for parboiling rice, making puffed rice, and making flaked rice.
3. The creation of tools and procedures for the processing of pulses to create dhal with a higher rate of recovery and better quality.
4. Creation of dryers that use solar energy, agricultural byproducts, and leftovers.
5. The adoption and development of methods and machinery for the manufacturing of products high in protein, such as full-fat soy flour, soy paneer (TOFU), soy beverages and milk, and

baked goods fortified with soy. Pollution control and safety

Equipment development including the creation of machines to make leaf cups and donas, multipurpose mills, mini flour mills, grain pearlers, maize dehuskers, shellers, groundnut decorticators, fruit graders, juice extractors, high recovery mechanical oil expellers, and improved storage energy efficiency has decreased worker drudgery.

7. The creation of raw materials and manufacturing procedures for instant sweets, curries, snack meals, instant soft beverages, dosa, idli, sambhar mixes/powders, and easy structures for cereals, pulses, oilseeds, onions, and potatoes.

XII. CHALLENGES

- **Small Landholdings:** Due to the difficulty in achieving economies of scale due to small landholdings, farmers are compelled to practise subsistence farming.
- **Agriculture products are perishable by nature,** which need extensive infrastructure in the form of cold storage and excellent transportation connectivity. India experiences problems with both forward and backward links.
- **Agriculture products are perishable by nature,** which need extensive infrastructure in the form of cold storage and excellent transportation connectivity. India experiences problems with both forward and backward links.
- **Seasonal nature:** Because of this, farmers only have a very little window of time to enjoy the fruits of their labour. Climate change has recently had an impact on weather patterns, which has had a negative impact on agricultural production.
- **Competition:** Bangladesh and other nations in the region that offer comparable benefits in terms of low labour prices and fertile soil are beginning to put more and more pressure on India.
- **Low Knowledge:** Another significant barrier is a lack of information, ignorance, and knowledge regarding opportunities, technologies, and production methods.
- **Variability:** The amount and quality of raw materials might vary in agro-based companies. Variations in weather and soil conditions have a negative impact on the quantity of raw resources. Because of a lack of standardization, the quality decreases. These elements put additional pressure on production, scheduling, and quality control activities in agro-based companies.
- **The absence of modern infrastructure** is one of the biggest problems facing India's food processing industry. Small and medium-sized enterprises (SMEs), which make up a large portion of the food processing industry, frequently lack the funds necessary to modernise their

facilities and equipment. The industry is also troubled by ineffective financing and credit availability, poor storage and transportation infrastructure, and ineffective supply networks. Small and medium-sized businesses (SMEs) find it challenging to enter the market and compete with more established, larger businesses because of these problems.

XIII. CONCLUSION

There are already some actions being made to solve the issues for instance, the Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters, was introduced by the Ministry of Food Processing Industries. The programme intends to develop contemporary infrastructure for food processing and preservation, enhance SMEs' access to financing, and offer these businesses technical help and training. Also, the government has established a number of food parks and clusters, which offer a variety of facilities and assistance services to businesses engaged in food production.

Innovative turnkey solutions for processing food goods like grain and rice are being offered by private technology providers, who are also joining the race. These solutions are not only highly customizable, but they can also be implemented, set up, and scaled economically with ease. This enables businesses involved in food processing to expand smoothly, enhance output, and boost profitability.

The year 2022 was an exciting one for the food processing sector in India. Although confronting many obstacles, the sector has been uplifted and a sustainable route for future growth has been made possible. The sector is being pushed to become an even more significant part of India's GDP and economic growth due to the rising demand for processed food products on domestic and international markets as well as favourable government initiatives. The potential is there; all that is required is for the various parties involved—from the government and private investors to food processing companies and tech players—to unite and seize it.

Only a local brand can satisfy local taste preferences, which has led to the emergence of numerous local players with sizable market shares in smaller locations, particularly Tier 2 and 3 cities. The existence of effective D2C marketing channels has aided in promoting regional brands to national prominence. There is always a demand for locally processed food, notwithstanding the emergence of major MNC players in the industry of food processing. Better government policies and a surplus of raw materials are further enabling elements for food processing plants.

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