Green Processing Revolution

Focus on Agriculture and Food Processing

February 2022

KNOWLEDGE CHAMBER OF COMMERCE AND INDUSTRY

VERTEBRAND

About Vertebrand

Vertebrand is a 22-year young consulting firm, obsessively focusing on building brand value for businesses across sectors. In simple terms, Vertebrand is arguably the only Indian firm which specialises in “brand-guided business transformations”.

Founded in 2000, Vertebrand has today a team of over 20 Expert partners, specialising across functions and industry domains. With a proprietary model for Brand Valuations, Vertebrand is the “go-to” consultancy for any start-up or large capital business, specifically looking at enhancing the numerical value of its brand equity.

Vertebrand has three competencies- Demand Fulfilment, Demand Generation and Organisational Productivity. Each of these capabilities is housed in a specific practice. More often than not, the three practices function together seamlessly, to help deliver impact at every step of the business’ brand value chain.

The Vertebrand group has to its credit, a slew of industry-endorsed consulting methodologies, which have been successfully deployed across industry sectors, to ensure business impact. Our consulting tools are tech-enabled and use deep analysis of data as well as creative innovation based on customer insights. It is this perfect combination of left-brain rigour and right-brain innovation that sets Vertebrand apart from every other agency in the country.

Over the years, Vertebrand has undertaken several consulting engagements for a host of prestigious organisations across sectors. The Vertebrand team has deep-domain expertise specifically in the agriculture sector, having worked with the likes of TAFE Tractors, VST Tillers, Nuziveedu Seeds, Namdhari’s, Coromandel Fertilisers etc. For more details about the group, please do visit www.vertebrand.com

Having grown from strength to strength over the last 2 decades, Vertebrand is now poised to embrace its next phase of growth and exploit the plethora of opportunities afforded by the burgeoning Indian economy.

Preface

At the time of Indian Independence, more than three-quarters of the population depended on agriculture in one way or another. Agriculture at that time faced several problems with low productivity, high monsoon dependence, lack of efficient irrigation and an absence of modern technology. The British Raj promoted only cash crops and not food crops and India had faced severe famines during this time. In 1947, the new government pursued the idea of self-sufficiency, and this fueled the idea of the Green Revolution in 1965. The use of High Yielding Variety Seeds (HYVS), better irrigation methods, use of pesticides, fertilisers, and tractors among others, gave a tremendous impetus to the growth of the agriculture sector. The emphasis of the plan was mostly on food grains such as wheat and rice while commercial crops like cotton, jute, and oilseeds were not a part of the plan.

It is a paradigm shift in government policy that the focus has shifted from food grain productivity and security in the 1960s to doubling farmers' income (DFI) by 2022. A NITI Aayog policy paper by Ramesh Chand states that earlier policies "did not explicitly recognize the need to raise farmers' income and did not mention any direct measure to promote farmers' welfare." Experience shows that in many cases, farmers' income remained low even though the output had increased, and this is evident from the prevalence of poverty among farming households.

Doubling real income of farmers by 2022-23 over the base year of 2015-16 requires an annual growth of nearly 11% in farmers' income. To achieve this, there needs to be a sharp acceleration of the previous rate of growth. This would require major changes in agriculture and allied sectors that address the sources of farmers' income. Agricultural productivity in India is still very low as compared to countries like China; in 2020, China's agricultural output stood at 670 billion kg compared to 308 billion kg for India, even though China has less area under cultivation and consumes less fertiliser.

This paper highlights the current scenario, recommendations to the Government and the various opportunities that now present themselves in this new landscape of policy changes. Due to increasing population and the economic transformation in early 1990s, there is rising food demand and a shift in food consumption patterns from cereals to protein. Natural resources are becoming scarce and there is significant wastage in the food chain.

Against this backdrop, agribusiness and allied companies of the private sector and the government could work together to attain the visionary goal of doubling farmers' income and unlock the true potential of the agricultural sector.

I. Current Scenario

Since Independence, India has strived for food security and with the second largest amount of arable land in the world, there is no dearth of agricultural land. Yet, the productivity is far below that of other countries and India's farmers are not doing too well. Moreover, only a third of all agriculture companies posted a profit in recent years. The visionary goal set by the government to Double Farmer Incomes is a long-awaited change and it denotes the welcome trend that India views its agrarian economy as agribusiness.

Agribusiness is a broad term encompassing all aspects of agricultural production, processing and distribution. It includes food, forest, and fibre production, by product utilisation, agrichemicals and pharmaceuticals (pesticides, fungicides) and agri-finance and trade. Agribusinesses are important to India for many reasons. Their contribution to the economy (19.9%), the number of people employed (58%), food security and sustainable food production and providing raw materials to other industries, among others. The demand for processed food items is set to increase in India in the coming years, providing opportunities for greater value addition as well as employment.

Twenty-one years into the new millennium, when technology has touched every aspect of our lives, most Indian farmers continue to deploy antiquated agrarian practices. These practices, along with issues like spiraling inflation, increasing imports, and a multitude of challenges faced by the agricultural sector, pose a serious threat to the country's aspiration to succeed in its vision for the next decade.

In organising the Knowledge Summit on the Green Processing Revolution, the aim is to build on the various efforts undertaken in the past to resolve issues faced by Indian agriculture. The stakeholders in this sector also need to learn from global best practices and adapt them to the Indian environment. While the Summit may not be the last word on potential solutions to these issues, it does hope to kickstart meaningful dialogue as well as changes.

The Knowledge Summit attempts to highlight agribusiness opportunities for each element of the agriculture value chain, be it within products such as food grains, dairy, meat, and fruits and vegetables, within inputs like fertilisers, credit, or crop insurance, farming practices, warehousing, logistics, food processing, or food retail.

The Indian agriculture industry can be classified into four major product groups, food-grains, fruits and vegetables, dairy, and meat. India is the world's largest consumer of pulses, which is a major source of protein for the domestic population. The annual food demand in India is expected to increase up to 400 million tonnes per year by 2025 – a 37 per cent growth from 2015 levels – primarily in pulses, fruits, and vegetables. This is driven by the growing consumer class, changing diets and a shift in favour of higher value products (such as proteins, fruit, dairy, packaged goods, high end products) similar to the trends

seen in other developing countries. Importantly, increased meat production can result in increasing the demand for grains, protein meal, and fodder.

A key issue that India faces is that the growth is unevenly distributed in the states. Parts of India are self-sufficient, while others are deficient. There are pockets of concentrated demand for high value products in urban areas, though the rural sector is also showing an increasing demand for more value-added products.

India is a major agricultural producer, and the agricultural output has shown a positive growth in GVA (Gross Value Added) of 3.4% in 2020-21. After 17 years, the share of Agriculture in GDP hit 20% and agricultural exports are expected to reach USD 40 billion in 2022. The importance of these statistics is probably most significant because of its potential to grow. Yet the sector is highly inefficient, and the output is quite volatile.

Uninterrupted supply to satisfy the demand is constrained by several factors including inadequate linkages to markets and distorted pricing mechanisms. Fluctuations in monsoon rains still affect many farmers despite improving irrigation methods in the last couple of decades. The irrigation methods have another fall out; there is over extraction of groundwater by farmers which lowers the level of the water table resulting in water scarcity in many areas. One study predicted that some Indian states would exhaust their subterranean supplies by 2030. Groundwater is also progressively becoming more contaminated by fertilisers and pesticides. This will again have significant impact on food security.

Nearly half the area of India is arable land, yet the distribution of this acreage is not optimal as several farmers have very small holdings and others own no land. Land appropriation, tree felling, and land clearing are other issues. By some estimates, food loss and wastage in India's total agricultural yield is around 30% per annum. Up to 40 per cent of India's land area is degraded through inefficient crop rotations or overuse of agrochemicals. Lastly, there are infrastructure and storage gaps and logistical challenges for distributing produce.

Policy and Regulatory Environment

India's policy environment deserves special mention as agriculture is one of India's most regulated sectors. Indian policy makers understand what is needed to improve the sector, but political constraints make change difficult. An important issue is also the poverty and debt of small farmers in all regions and there is political pressure to support farmers, which is compounded by the high number of farmer suicides. Granting farm loan waivers are sometimes misused as political tools to gain popularity. Political sensitivity is high and constrains big reforms as observed in the recent farmers' protests. In addition, food, agriculture, and water policy is spread across several central ministries, making policy management and renewal very complex.

The Central government has opened the door to reforms and implementation is being taken up at various levels in the states. The launch of the online National Agriculture Market (eNAM) portal by the central government can facilitate better links between sellers and buyers.

Current barriers to trade include:

Minimum Support Price for certain commodities. Producers can sell as much as they wish to procurement agencies at set prices, subject to quality.

Input subsidies: Fertiliser support is one of the largest input subsidies where government controls prices and pays the difference to market prices. Other subsidised imports include irrigation, electricity, diesel, and seeds.

Import tariffs which are applied to most imported food products, keep domestic food prices above world levels. In India, simple average applied tariff for all products is 13.4% compared with 9.9% for China and 2.5% for Australia. India's average applied tariff for agricultural products is 32.7%. While applied tariff rates have declined significantly since 1991, they are volatile and remain among the highest in the world.

Food subsidies. The central government subsidises food to support the section of the population living in poverty and to offset the impact of policies such as the maintenance of minimum support prices and tariffs which keep food prices high.

Divergence from internationally accepted **standards**. India imposes import certification requirements which are not in accordance with international food safety measures.

Other non-tariff barriers include **import bans** (animal products), quality standards (fumigation of pulses by methyl bromide) and labelling and packaging norms that are very different from international practices.

Other constraints include a lack of reliable supply chain logistics and cold storage options and erratic electricity supply. Lack of skilled personnel to operate and maintain systems, for example micro irrigation. The small scale of much of India's farming (around 80% of farms are less than two hectares) hinders the adoption of capital-intensive equipment. Lack of access to financial services and formal credit for Indian farmers.

II. Opportunities for the Corporate Sector

The Indian food and grocery market is the world's sixth largest, with retail contributing 70% of the sales. The share of agriculture and allied sectors in Gross Value Added (GVA) was 17.8 % in FY20. India is the world's second-largest producer of rice, wheat, sugarcane, cotton, groundnuts and fruits & vegetables. It also produced 25% of the world's pulses until 2019. According to the Department for Promotion of Industry and Internal Trade (DPIIT), the Indian food processing industry has attracted Foreign Direct Investment (FDI) equity inflow of about US$ 10.43 billion between April 2000 and June 2021.Given these figures and the impetus given through Government reforms, the Indian food industry is poised for huge growth. According to Inc42, the Indian agricultural sector is predicted to increase to US$ 24 billion by 2025.

The Indian food industry has immense potential for value addition, particularly within the food processing industry. The Indian food processing industry accounts for 32% of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth.

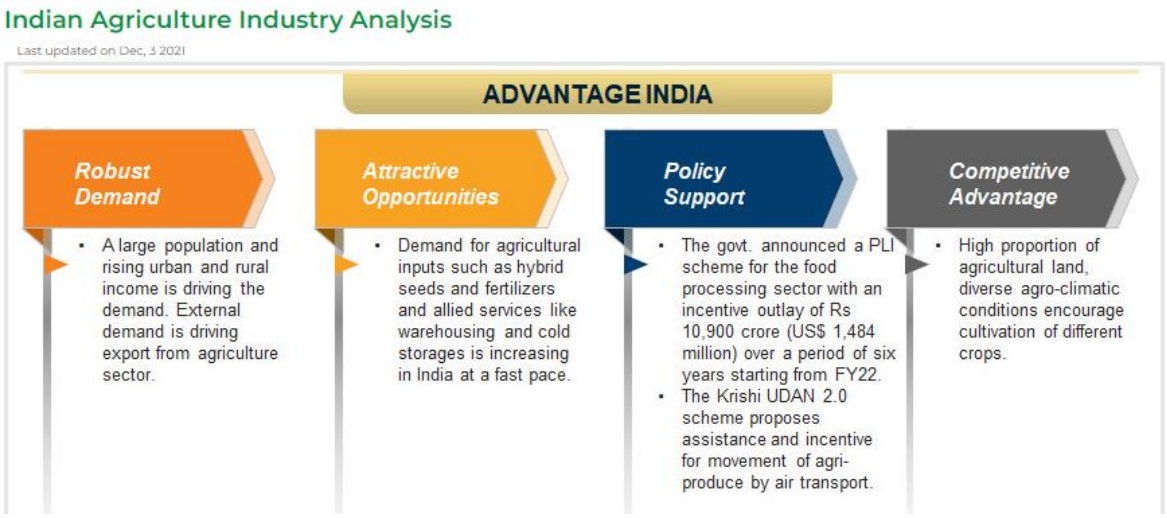

Fig 1. Indian Agriculture Industry [Source: https://www.ibef.org/industry/agriculture-presentation]

Leveraging leading practices from all over the world, Agribusiness companies can create value and boost farmer incomes by investing in the following:

1. Fruits, Vegetables, and Pulses

It is expected that the demand for mango, tomato, potato, pomegranate, onion, and grapes will account for around 65% of produce value through a combination of exports and food processing. Demand in

urban areas for packaged and branded pulses and fortified pulses is on the rise along with the ready-to-eat snacks market which is growing at 20% CAGR.

Key factors that could make Fruits and Vegetables an interesting opportunity are:

- Growing demand, trade volumes and domestic consumption – only 2% of Fruits and Vegetables are processed in India as compared to 30-50% in in developed countries.
- Low levels of Government regulations – no MSP subsidies for food processing and most state governments have abolished APMC – market linkages.
- Lot of scope for reducing wastage and losses and increasing yield - fruits and vegetables account for nearly 40% of overall food wasted in India, most of which is due to loss of bananas, onions, and tomatoes.

Improving Productivity in Fruits and Vegetables

Yields of fruits and vegetables are lower than western averages across all categories. There is a huge opportunity for players to work on seeds and soil health. To improve productivity, output per square unit of land needs to rise since the area of land under agricultural use has been decreasing in recent years. Other required changes within the agricultural sector would be to increase the efficiency with which resources are used and saving in cost of production. Cropping intensity can be increased by raising short duration crops after the main kharif and rabi seasons. Diversification towards high value crops that are amenable for exports should be encouraged. To see an improvement in terms of trade for farmers or real prices received by farmers, the current strategy is focusing on introducing modern reforms such as Cold Chain development to reduce wastage and eNAM and similar online platforms for more realistic price points for the produce.

ROI for farmers in Fruits and Vegetables is two to three times as compared to other field crops. This has led to a growth in acreages by nearly 3% per annum in the last five years. This has the potential to increase farmers income. [source: FaoStat, 2011 food balance data, World Research Institute, Food loss and Waste]

2. Farmgate Infrastructure

The Government of India has announced on May 15, 2020, an Agri Infrastructure Fund of One Lakh Crore rupees to help private enterprises, Farmer–producer organizations (FPOs) and others to create farmgate infrastructure. This would be in the form of warehouses, drying and packing facilities, private mandis, transportation and logistics, cold storage, and cold chain facilities.

Cold Chain Development efforts were earlier focused on building storage capacity for cross seasonal storage of produce. This resulted in development of bulk storage for a single commodity but there was

no improvement of any back-end processes. Many of the fresh produce items require urgent farmgate activities such as pre-cooling to initiate cold chain as a conduit to market. Development of modern packhouses as aggregators of farm produce is also needed.

Despite current challenges, this segment is expected to enjoy significant growth due to rising food demand, supply deficits and improved market economics. The Indian cold chain market attained a value of INR 1,425 billion in 2020, driven by the growth in the organized food retail industry and expected to double by 2026.

Cold chain players could invest in alternate energy technologies like solar-powered systems, they can explore chemical treatments to extend the shelf-life of produce and set up pack houses and reefer transport. They could also optimize the use of existing facilities by opening them up for multiple crops instead of a single crop or product.

However, there is a need to invest in suitable digital systems and software and not physical structures alone. Electronic warehouses with warehouse receipt systems need to be created to establish world class, smart and modern transport systems. This is a huge opportunity to save the 30% losses that are incurred due to improper storage and transportation of farm produce.

3. Connecting farmers with markets including exports

The length of the chain between farmers and markets needs to be shortened and can be done only through reducing intermediaries and improving the efficiency of the supply chain. Investors can set up aggregation platforms, especially for perishables like fruits and vegetables, establish cleaning, grading, and packing facilities in clusters and set up a supply linkage with large retails chains and ecommerce platforms. Other crops like cereals, millets and pulses can also be added to this portfolio. This will need to be combined with Agri-tech by providing farmers with app-based outreach, arranging online technical advice for them and a bank funding system. This will liberate both the farmers and the consumers. Export of agricultural produce has a very high growth potential. There is a huge opportunity for those players who can easily diversify into export markets by creating export-oriented production zones for farmers. For a successful agricultural export policy, the most important factor would have to be a robust infrastructure with storage and processing facilities, good roads, and world-class exit point infrastructure at ports to enable swift trade.

4. Custom service centers for machines and irrigation facilities to serve clusters of villages.

Farm mechanization plays an important role in enhancing productivity. Mechanization of agriculture will need large scale availability of machines, but farmers cannot afford to buy them. Custom service centers

will provide agronomic services to farmers through machines owned by the service center. These centers will require large investments in infrastructure, purchase of machines, training, manpower, complete digitization of the service including pest identification, advisory service, spraying of crop protection chemicals and similar services. Large scale farmer data base can be built through such centers and data points can be collected from fields over a period of time and analyzed using big data and AI tools. This can make farming a more precision and data driven profession leading to much better efficiencies. Setting up a chain of such service centers would go a long way to achieve efficiencies in machine capacity utilization.

5. Capacity building in rural areas

Farmers need help in terms of organizing themselves into Farmer Producer Organizations, training, digital literacy, leadership development and similar capacity building measures. Investors may set up such capacity building centers in the rural areas and help farmers and others to develop capability to build digital skills, set up cottage industries with market linkages being provided by the investor, provide financial and insurance services, and improve other social development indicators in villages. Government has just announced many programmes for supporting micro food enterprises, dairy, fisheries, and other businesses in rural sector which can be utilized by the rural people with the help of these capacity building centers. Setting up a network of such centers may not need huge investment, but it will have a developmental dimension to the investment making it a social venture. This will create a huge social impact on our rural population.

It is important that any new investment should aim at combining physical infrastructure with digital backbone. Many Agri Tech innovators and entrepreneurs are now in advanced stages of offering their products and services which will make the above four opportunities possible. Investors can rope in such Agri Tech enterprises into their business models and establish partnerships with them for mutual benefit. It is a whole new game that is opening up.

Market linkages between farmers and buyers will establish transparency in pricing and better value, especially for perishable products. It could also help to increase farmer incomes by at least 8 to 10 percent. In addition, it will enable the downstream players to source more effectively by eliminating intermediaries. Farmer–producer organizations (FPOs) are already aggregating supply and supporting farmers towards this goal.

6. Unlock large opportunity through Digitization and analytics

Digitization and analytics will play a critical role in building India's farms of the future. Potential disruptions that could unlock value through the food-chain include integrating field data, weather patterns and yield forecasting, supply chain management, online loan disbursals, insurance pay-outs, and platforms to integrate farmers and wholesale markets.

Farming technology such as greenhouse systems, drip irrigation, farm mechanization and automation can also be leveraged to improve yield and efficiency.

7. Invest in ecosystem partnerships for disruptive solutions

A slew of start-ups is playing in one part of India's agriculture value chain to disrupt prevalent business models. In response, larger players could partner with them or incubate their own new businesses. The effort would ultimately result in innovative solutions for farmers.

Rising wages, growing awareness of farm mechanization, and easier credit lending to farmers will all boost the market for a shared farm-economy. There is potential to create a marketplace for equipment rentals. Given the small and scattered land holding patterns in Indian agriculture, the services market is bound to increase in the years to come. Such agriculture services will increase the adoption of farm mechanization, which in turn could increase farmer income by around 5 percent.

8. Offer agriculture financing and crop insurance to strengthen the ecosystem

Invest in end-to-end value chains, particularly in F&V and pulses, where demand is expected to grow disruptively. Provide innovative equipment-financing models to farmers through partnerships with manufacturers, weather forecast agencies, and digital partners. Offer easy financing for FPOs for community infrastructure for storage and transportation. Create digital ecosystems for financing and crop insurance.

III. Focal role of the Government

The government has set a target to double farmers income by 2022 and to this end announced reforms to encourage private investments in the agricultural sector to support farmers.

The reforms include Amendments to the Essential Commodities Act (ECA) which removed stock limits, reduced risk on investments in infrastructure thus encouraging private investment. Reforms for the selling process allowing farmers to sell to any person or organization anywhere in the country removed state-wise restrictions also. This can reduce costs for aggregators and Agri Tech start-ups who sell to wholesalers and retails thus dismantling the APMC (Agricultural Produce Market Committee) monopoly.

The reforms can bring about better returns for famers and bring in a much-needed transparency in transactions.

The government can continue to support businesses to create value in the agriculture sector and focus on some crucial areas:

- Enable portfolio shift towards high value crops, horticulture, fisheries, and sericulture, etc.
- Increase land and labour productivity in agriculture through precision agriculture, new techniques such as hydroponics and bioengineering
- Shift in focus from primary production towards processing and retail as this sector is poised to increase greatly
- Greater private sector engagement in all steps of the chain including in financing, insurance, farm operations, and logistics
- Concrete projects and well-defined performance indicators to track transformation and collaboration between stakeholders.
- Increase resource use-efficiency by investing in soil health management, water management and groundwater recharge
- Increase farmers' knowledge of the high productivity practices and high value product choices available to them. Help farmers to navigate market inefficiencies rather than settling for lower prices.

IV. Conclusion

Agriculture is the life of the Indian economy as it employs more than half of the Indian population and contributes up to 20.19% to the GDP. The Government has launched a series of reforms to improve the ease of doing business, reduce red-tape, promote digital transactions, and implement the GST, to name a few. However, the agricultural sector is still highly vulnerable to changes in weather, inadequate irrigation facilities, and lack of access to modern infrastructure and technology. With the Government promoting initiatives, institutions and innovations to achieve its goal of doubling farmers' income, it shall definitely be transformative and shall pave the way forward for India's self-reliance in the agriculture sector. The Food Processing sector, wherein 100% FDI has been allowed, is expected to play a pivotal role in recasting India as a global leader in the coming decade. The government could propel the growth of underfunded segments such as financial services and precision farming and provide access to government research facilities. Private investors with experience can help start-ups successfully attain scale. They could also contribute to the Indian Agriculture growth story by transferring knowledge from their global success stories.

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www.ibef.org – Indian Brand Equity Foundation