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Integrated Supply Chain in Indian Organic Farming

Prem Nath Panday[1] and Suruchi Panday[2]

School Of Business Studies, Sharda University - Knowledge Park-III, Greater Noida- 201306
2Student-Indira Gandhi National Open University- New Delhi
E-mail: [1]premnathpa@gmail.com, [2]suruchi.panday@gmail.com

Supply Chain:
Supply chains are principally concerned with the flow of products and information between supply chain member organizations-procurement of materials, transformation of materials into finished products, and distribution of those products to end customers. Today's information-driven, integrated supply chains are enabling organizations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers. The real measure of supply chain success is how well activities coordinate across the supply chain to create value for consumers, while increasing the profitability of every link in the supply chain. To create value for businesses, organizations need to focus on an effective supply chain strategy.

Purpose:
Demand for food is growing at a much faster rate than ever before, but not without numerous operational challenges. Farmers, retailers and food processor manufacturers are thus looking to streamline their supply chains while addressing ever-expanding market requirements.

Design:
GDP of India is estimated in terms of gross value added (GVA) and defined as the difference of Output and Input. In estimation of GDP from Agriculture and Allied Sector, outputs are evaluated at farm harvest price, Inputs of raw materials and services are evaluated at purchasers' prices.GVA of Operation of irrigation system by government sources are also estimated along with Agriculture and Allied Sector and are evaluated using income approach.

Managerial Implications:
In the last few years there has been an emergence of more coordinated supply chains for fruits and vegetables in India catering to the export market and to the high end domestic market. On the domestic front this trend has primarily been led by the growth of large hypermarkets, supermarkets and other organized retailers in metropolitan centers.

Future scope/Limitations and recommendations:
Key food supply chain challenges include: Food origin and mileage: In the past decade, the country of origin of the food and food mileage are becoming increasingly important & to achieve this, their first step should be to improve collaboration with local farmers and involve them in the planning of their value chain delivery networks. The planning itself must begin with the redesign of their transport networks, from farms to consumers, since food miles is a primary factor in the determination of the freshness of food, carbon emissions and the cost of delivery.

Findings:
The world's largest democracy (India) is well on its way to becoming the world most powerful economy. Concepts such as just-in-time, virtual inventory, supplier rationalization, and reductions in the number of distribution facilities have reduced total Supply Chain costs, but the result has been increased risk. From the review of literature it can be concluded that, strengthening the following aspects develops a better model of agriculture supply chain management which helps in solving the food problem of the country indeed the world.

Scope of the Study:
There is good reason to believe that organic agriculture may lower certain health risks.

For the environment: Organic standards focus primarily on environmental issues. Although they cannot eliminate environmental impacts, they seek to minimize the likelihood of water pollution, to build soil quality and to enhance biodiversity.

For economic reasons: While the price of is a deterrent to many consumers, for most farmers the high prices of organic commodities are very attractive.

For other social and ethical reasons: Many consumers and farmers think that organic agriculture does a better job of supporting small and family farms.

The combinations of this decision define the differential and competitive advantage on the Supply Chains.

Keywords: *Economic Impact, Supply Chain, Indian farming*

Introduction:

India is the world largest producer of many fruits and vegetables but there still exist huge gap between per capita demand and supply due to enormous waste during post-harvest storage and handling caused by improper bagging without crating, lack of temperature controlled vehicles, unavailability of cold chain facilities in various parts of country for preserving the produce, along with significant processing of the agricultural produce which results in immense losses to the nation. Hence a proper supply chain management in fruits and vegetables has to be improved in all the stages of the supply by adopting best global practices in storage, packaging, handling, transportation, value added

service etc to meet the country's demand of fruits and vegetables. An effective supply chain results in satisfying customers, streamlining costs, and supports growth and expansion into new target markets. Even though businesses have evolved and reached a point of sophistication where they have improved their supply chain maturity, they are far from reaching a stage of supply chain in food industry.

Levels of supply chain maturity:

The first level involves individual processes and regions to be optimized such that efficiency and performance are in turn optimized. However, owing to the lack of integration and coordination between elements, the business does not benefit from interdependent business operations.

The second level sees crucial departments such as procurement, finance, and logistics working in sync with each other. And even though this integration is applied across geographies, it still leaves the customers and suppliers excluded.

The third level sees a convergence of information from multiple sources including customers and competitors, which gives rise to creating a unified network in an organization.

The last level is that of supply chain orchestration which leads to forming a single view of the customer. The ultimate goal of having standardization, scalability, and adaptability is seen coming to fruition at this stage

Agricultural commodities produced have to undergo a series of operations such as harvesting, threshing, winnowing, bagging, transportation, storage, processing and exchange before they reach the market, and as evident from several studies across the country, there are considerable losses in crop output at all these stages *Agriculture Supply Chain Management:*

According to Ganeshan and Harrison (1995), a Global Supply Chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers." Many Global Supply Chains have been significantly altered over the past decade, but this core definition remains unchanged.

Organic farming in India has been practiced by farmers for over thousands of years. This practice continued till the 1970s, after which chemical farming was encouraged by the government to increase food production in the country. The era was generally called Green Revolution. The positive effects of chemical farming were immediately seen, with India producing surplus food grains but at the cost of the environment.

In India, the development of organic agriculture is receiving increasing attention among farmers, producers, processors, traders, exporters and consumers. Growing consciousness of health hazards due to the possible contamination of farm produce from the use of chemical fertilizers have immensely contributed to the revival of organic farming during the last five years.

Supply chains are principally concerned with the flow of products and information between supply chain member organizations - procurement of materials, transformation of materials into finished products, and distribution of those products to end customers. Today's information-driven, integrated supply chains are enabling organizations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers. The real measure of supply chain success is how well activities coordinate across the supply chain to create value for consumers, while increasing the profitability of every link in the supply chain. In other words, supply chain management is the integrated process of producing value for the end user or ultimate consumer. The supply chains of different agricultural commodities in India, however, with challenges stemming from the inherent problems of the agriculture sector. The agriculture supply chain system of the country is determined by different issues like dominance of small / marginal farmers, fragmented supply chains, absence of scale economies, low level of processing / value addition, inadequacy of marketing infrastructure etc. Early processing - based supply chain management success included improved relationships between warehousing and transportation within farmers as a result of reduced inventory and better response time to customer requests for products and services. Supply chain management then entered a logistics stage where other functional areas within farmers joined forces to incorporate manufacturing, procurement, transportation, distribution, and marketing to effectively compete in the marketplace. This stage was aided by the use of telecommunications, electronic data interface, and other technological advances that made the transfer of information more transparent across the functional areas between farmers.

Importance of Agriculture Sector:

Agriculture continuous to be the key sector of the Indian Economy, and contributes about 14.5 % of the GDP. It is known through surveys that almost two-thirds of the population in India is connected with agriculture for their source of income. Almost 54% of employment is created through agriculture either directly or indirectly. The performance of agricultural sector during the past three decades has been with a growth rate of 2.59 percent per annum. In spite of being only 14% of Economy's GDP, dependence on Agriculture is more than 50%, i.e., still today more than 50% of population relies on Agriculture and Allied Sector for employment and livelihood. Census-2011 suggests that 68.8 % of rural population and 31.6 % of Urban Population are engaged in Agriculture and Allied Sector. Growth of Agriculture and Allied Sector impacts all sectors of Economy.

India's economy:

Agriculture plays a vital role in India's economy. Over 58 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture, along with fisheries and forestry, is one of the largest contributors to the Gross Domestic Product (GDP).

As per estimates by the Central Statistics Office (CSO), the share of agriculture and allied sectors (including agriculture, livestock, forestry and fishery) was 15.35 per cent of the Gross Value Added (GVA) during 2015–16 at 2011–12 prices.

India is the largest producer, consumer and exporter of spices and spice products. India's fruit production has grown faster than vegetables. India is the second largest fruit producer in the world. India's horticulture output, comprising fruits, vegetables and spices, -year in 2014-15 to a record high of 283.5 million tonnes (MT) It ranks third in farm and agriculture outputs. Agricultural export constitutes 10 per cent of the country's exports and is the fourth-largest exported principal commodity. The agro industry in India is divided into several sub segments such as canned, dairy, processed, frozen food to fisheries, meat, poultry, and food grains.

The Department of Agriculture and Cooperation under the Ministry of Agriculture is responsible for the development of the agriculture sector in India. It manages several other bodies, such as the National Dairy Development Board (NDDB), to develop other allied agricultural sectors.

Indian Market Size:

Over the recent past, multiple factors have worked together to facilitate growth in the agriculture sector in India. These include growth in household income and consumption, expansion in the food processing sector and increase in agricultural exports. Rising private participation in Indian agriculture, growing organic farming and use of information technology are some of the key trends in the agriculture industry.

As per the 4th Advance Estimates, food grain production is estimated at 253.16 million tonnes (MT) for 2015-16. Production of pulses estimated at 17.33 million tonnes.

With an annual output of 146.3 MT, India is the largest producer of milk, accounting for 18.5 per cent of the total world production. It also has the largest bovine population. India, the second-largest producer of sugar, accounts for 14 per cent of the global output. It is the sixth-largest exporter of sugar, accounting for 2.76 per cent of the global exports.

Spice exports from India are expected to reach US$ 3 billion by 2016–17 due to creative marketing strategies, innovative packaging, strength in quality and strong distribution networks. The spices market in India is valued at Rs 40000 crore annually, of which the branded segment accounts for 15 per cent.

The procurement target for rice during marketing season (MS) 2015–16 has been finalized as 30 MT.

Indian Government Initiatives:

Given the importance of the agriculture sector, the Government of India, in its Budget 2016-17, planned several steps for the sustainable development of agriculture.

Budget 2016-17 proposed a slew of measures to improve agriculture and increase farmers' welfare such as 2.85 million hectares to be brought under irrigation, Rs 287,000 crore grant in aid to be given to gram panchayats and municipalities and 100 per cent village electrification targeted by May 01, 2018.

The government has already taken steps to address two major factors (soil and water) critical to improve agriculture production. Steps have been taken to improve soil fertility on a sustainable basis through the soil health card scheme and to support the organic farming scheme 'Paramparagat Krishi Vikas Yojana'. Other steps include improved access to irrigation through 'Pradhanmantri Gram Sinchai Yojana'; enhanced water efficiency through `Per Drop More Crop'; continued support to Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the creation of a unified national agriculture market to boost the incomes of farmers.

The Government of India recognizes the importance of micro irrigation, watershed development and 'Pradhan Mantri Krishi Sinchai Yojana'; thus, it allocated a sum of Rs 5,300 crore for it. It urged the states to focus on this key sector. The state governments are compelled to allocate adequate funds to develop the agriculture sector, take measures to achieve the targeted agricultural growth rate and address the problems of farmers.

Some of the recent major government initiatives in the sector are as follows:

Prime Minister Mr Narendra Modi has unveiled the operational guidelines for the Pradhan Mantri Fasal Bima Yojana which aims to provide farmers with crop insurance as well as

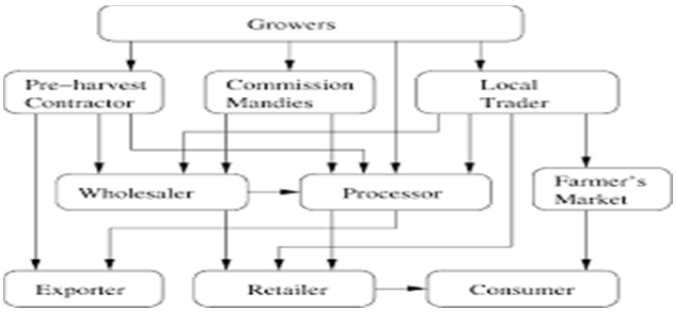
The Cabinet Committee on Economic Affairs (CCEA) has approved 'Blue Revolution', an umbrella scheme for integrated development and management of fisheries by Government of India, with total financial outlay of Rs 3,000 crore for a period of five years.

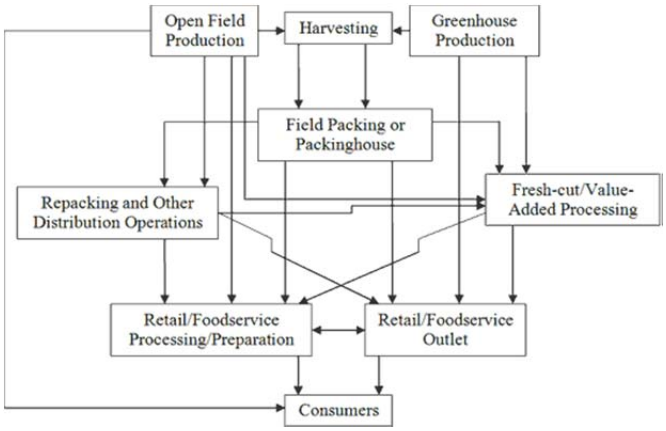
Schematic Diagram of farm to fork model in supply chain:

Demand for locally grown food is bringing supply chain sourcing back to its roots. This recent agricultural awakening is changing the way many food companies source products. Apart from marketing appeal, food quality and safety concerns, transportation costs, and local economic development efforts are compelling restaurants, groceries, and wholesalers to engage smaller producers and localize their

supply chains. In turn, they are nurturing a "fresh food fast" procurement model that is growing from the ground up.

The farm-to-fork model is by no means new. Throughout history, agriculture and animal husbandry have been critical elements in the local supply chain, providing sustenance as well as stimulus for related economic activity. Even as a tangential force, the farm community gave industrialists such as Henry Ford the vision for innovative ideas, including vertical integration. No less important, agrarian sensibilities and demands paved the way for the modern-day trucking industry.





For businesses that embrace the "buy local" mantra, one of the least tangible but most rewarding benefits is the intimate knowledge they gain of their product-literally from farm to fork. Knowing where a product comes from builds appreciation and adds value.

The advantages value creating activities for supply chain:

The advantages for supply chain members Individual suppliers, producers and marketers who are associated through a supply chain coordinate their value creating activities with one another and, in the process, create greater value than they can, when they operate independently.

Supply chains create synergies in one of three ways:

They expand traditional markets beyond their original boundaries and thus increase sales volume for members;

They reduce the delivered cost of products below the cost of competing chains and thus increase the gross margin for the working capital committed by members of the chain ; and

They target specific market segments with specific products and they differentiate the service, product quality or brand reputation of the products they deliver to these market 5 segments and thus increase consumer perception of delivered value.

In this way, they allow chain members to charge higher prices. Generally, supply chains increase market contestability both at the producer end and at the consumer ends of the chain. At the consumer end, chains compete primarily through price, differentiated products and services and differentiated terms of sale. At the producer end of the chain, supply chains compete with one another primarily for "producer affiliation" and core vendor commitments.

Components of an Agriculture supply chain Agriculture business, supply chain management (SCM) imply managing the relationships between the businesses responsible for the efficient production and supply of products from the farm level to the consumers to meet consumers' requirements reliably in terms of quantity, quality and price. In practice, this often includes the management of both horizontal and vertical alliances and the relationships and processes between firms. Agriculture-supply chains are economic systems which distribute benefits and apportion risks among participants. Thus, supply chains enforce internal mechanisms and develop chain wide incentives for assuring the timely performance of production and delivery commitments. Agriculture-supply chains are linked and interconnected by virtue of shared information and reciprocal scheduling, product quality assurances and transaction volume commitments. Process linkages add value to agricultural products and require individual participants to coordinate their activities as a continuous improvement process. Costs incurred in one link in the chain are determined in significant measure by actions taken or not taken at other links in the chain. Extensive pre-planning and co-ordination are required up and down the entire chain to affect key control processes such as forecasting, purchase scheduling, production and processing programming, sales promotion, and new market and product launches etc.

Following are the components of an organized Agriculture - supply chain:

1. Procurement or sourcing

2. Logistic management

Transportation, Material management, on the premise of supplying mostly from production not stock, Warehousing, Logistics Network modeling

3. Organizational management

Contracting, Strategic alliances and partnerships, Vertical integration, Long term storage , Packaging technology, Cold chain management, Energy efficient transport, Quality and safety.

4. Application of Efficient Consumer Response (ECR) System.

Electronic scanning of price and product at the point of sale, Streamline the entire distribution chain

Coordinated supply chains:

In the last few years there has been an emergence of more coordinated supply chains for fruits and vegetables in India catering to the export market and to the high end domestic market. On the domestic front this trend has primarily been led by the growth of large hypermarkets, supermarkets and other organized retailers in metropolitan centers. For exports, the emergence of dedicated export chains has been prompted by stricter quality and safety standards in certain export markets. Coordinated supply chains involve structured relationships among producers, traders, processors, and buyers whereby detailed specifications are provided as to what and how much to produce, the time of delivery, quality and safety conditions, and price. These relationships often involve exchanges of information and sometimes assistance with technology and finance. Coordinated supply chains fit well with the logistical requirements of modern food markets, especially those for fresh and processed perishable foods. These chains can be used for process control of safety and quality and are more effective and efficient than control only at the end of the supply chain.

Demand for organic food:

Demand for organic food is growing at a much faster rate than ever before, but not without numerous operational challenges. Farmers, retailers and food processor manufacturers are thus looking to streamline their supply chains while addressing ever-expanding market requirements.

Food Supply Chain Challenges:

Food Supply Chain Challenges across the supply chain are not necessarily exclusive to organic food. Conventional food also is affected by factors such as problems with the supply chain or inventory management. Organic farming, however, has unique challenges related to the cost and logistics of moving locally or regionally produced organic produce to the market. The concept of food mileage, which refers to the distance food, is transported from the time of its production until it reaches the consumer, gains prime importance in the case of organic food. The situation of small and medium farms is also to be noted. Currently, the production of produce in small to medium farms is rather limited, amounting to a few hundred tons. Such farms are not very lucrative for mainstream grocery chains. Further, many buyers seem to be ambivalent about channels of distribution. For some buyers, on the other hand, trust is the vital component for deciding whether to buy food products via a particular avenue. In fact, often consumers are not convinced about the value of buying organic food. Consumer consumption decisions regarding food products could, however, be hugely impacted by food mileage, price and the certification process. Lastly, there is a large knowledge gap spanning the marketing system in place, the value chain (i.e., activities that a firm performs to deliver a valuable product or service for the market) and the value delivery network (i.e., supply chain network) in the food system**.**

Key food supply chain challenges include:

Food origin and mileage:

In the past decade, the country of origin of the food and food mileage are becoming increasingly important. Maintaining supply volumes and supply continuity are major concerns for most food companies. It helps consumers evaluate food origin and infer whether it offers desired qualities, has credible production control and carries legitimate certification. Further, food import also highlights the issue of food mileage, and is linked to agricultural sustainability, as “food imports” do not match with local food production, freshness and community cohesion.

Size of farms and collaboration:

The majority of organic farms are small, privately-owned, family enterprises. Whether they are small plots in an emerging country providing food to a handful of citizens or larger-acreage plots in India, these independent operations often struggle with economic scale. This challenge is particularly evident in sectors such as dairy, pigs, fruit and vegetables, where scale and linkage with primary processing is critical.

Further, food requires more resources, particularly human resources, during production. Farming is a capital-intensive business, and productivity is enhanced with investment in new equipment. Similarly, marketing channels are more difficult to access for smaller producers. Better collaboration of the various participants in the food value chain with farmers can help alleviate this problem.

Conversion takes time:

Unfortunately, even when a farm decides to convert to organic, the transition isn’t simple or instantaneous. It varies slightly depending on the certification agency, but typically farms must:

> Learn new farming methods and processes.

> Farm organically on the previously conventional soil for at least three years

> Have periodic, comprehensive inspections by third-party agencies.

Market volatility:

Fresh produce markets are above all characterized by perishable products, seasonal production and a strong dependence of supply on climatic conditions. These characteristics entail high degrees of uncertainty and risk about market prices and quantities, which has traditionally deterred local farmers from negotiating contracts in the produce trade. However, better risk management and streamlining of the supply chain can help assure farmers of their profits and increase their willingness to trade with the large retailers. These long-term contracts with retailers will also enhance farmers' ability to obtain working capital financing, which has traditionally been a challenge for small farmers. By signing contracts with big-box retailers, farmers gain security that they can present to the banks to gain more favorable terms for loans and financial aid for investing in capital equipment.

Integrating the food value chain:

This requires collaboration in several areas:

Community Managed Sustainable Agriculture (CMSA): Under the CMSA mandate, promoting household food security models, establishment of a non-pesticide management shop, a custom hiring centre for renting out neem pulverizes, markers, weeding machines, and seed drums etc., implementation of poverty alleviation strategy with farm families, and setting up of retail outlets of organic farming produce at the district headquarters were some of the initiatives taken in the 2011-12 financial year.

Progressive farmers are investing in crop field trials and breeding programs either individually or collectively through agreements and producers associations and cooperatives. These farmers need to collaborate with other members of the value chain. In addition to sharing consumer information and preferences, these farmers need to better collaborate with manufacturers of organic fertilizers and pesticides.

Food processors are extremely important members of the food value chain that will need to support the expected demand of organic food. To do this, they will require significant changes to product lines, distribution channels and supply chains.

Leading global producers are already working to address new consumer demands, globally diverse diets and calls for sustainable supply chains and manufacturing processes. However, collaboration throughout the value chain is extremely important to this group, as the manufacturing of food — the central activity of the value chain — requires both up- and downstream collaboration.

Food and product safety (F&PS) has become a critical area of concern for farmers. New regulatory requirements, increased supply chain complexities and ongoing scientific developments present many challenges and opportunities. Leading farmers are investing in securing their supply chain, developing plans to manage recalls and enhancing product labeling and traceability. They are building compliance systems to ensure they are in accordance with all regulatory regimes where their products are consumed. Such systems include regular verification procedures to ensure ongoing compliance. Systems are also improving supply chain transparency through track and trace technologies. Once again, extensive collaboration and cooperation between the various elements of the value chain is necessary to ensure these systems operate effectively.

Minimizing lead time (SCM) from farm to shelf:

Sometimes, retailers store produce in their food warehouses for as long as 12 days, on top of which is the transit time from the distribution center to the store. In the case of alternative food systems, this step is greatly reduced (e.g., box delivery) or even eliminated (e.g., farmers markets).

- For a retailer to minimize the lead time from farm to shelf and thereby increase the shelf life of fresh food, a holistic approach is required to revamp warehouse management, order management and transportation management. Implementation of integrated automated storage/retrieval systems, automatic identification products, conveyors, order-picking systems, RFID, equipment and software and systems integrations is basic need.
- Streamlining logistics to minimize food mileage: With the increasing emphasis on sustainability, a large number of food retail giants are conscious of the miles their food travels before reaching the customer. Food miles are a major factor used to assess the environmental impact of food, including the impact on global warming. To improve the logistics associated with their food network, these farmers can exercise corporate social responsibility for creating a greener environment.

The Food Lifecycle

Sustainable Local Food System, Resource/ Waste Recovery, Production, Processing, Consumption, Access, Distribution

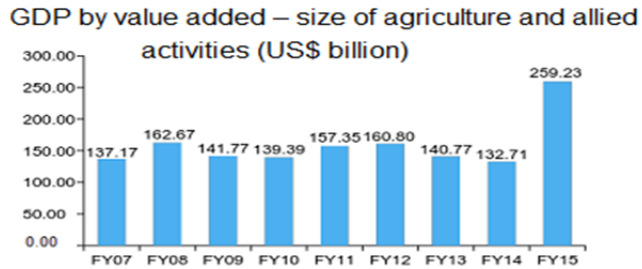
India in Agriculture & Allied Sector:

India ranks first in production of Milk, Cashew nut, Coconut, Tea, Ginger, Turmeric, Banana, and Black Pepper and total Cattle Population. India ranks second in total farm output and individually second in Wheat, Rice, Sugar, Ground nut and Inland Fish Production. We are third in production of Tobacco. We account for 10% of the world fruit production

Estimation of GDP of Agriculture & Allied Activities

Coverage : The activities covered under Agriculture and Allied Sector are Farm activities, which include Crops, Plantation and Horticulture; Livestock covering Milk, Meat, Egg and Wool; Fishery covering Inland, Marine & Subsistence; Forestry covering Timber, Non Timber, Fuel-wood.

Methodology: GDP is estimated in terms of gross value added (GVA) and defined as the difference of Output and Input. In estimation of GDP from Agriculture and Allied Sector, outputs are evaluated at farm harvest price , Inputs of raw materials and services are evaluated at purchasers' prices.GVA of Operation of irrigation system by government sources are also estimated along with Agriculture and Allied Sector and are evaluated using income approach. The GDP estimates are prepared at State level.



Source: Ministry of Agriculture, Print Release, RBI, TechSci Research; Notes: GDP – Gross Domestic Product, CSO – Central Statistical Organisation

Estimation of GVA of Agriculture Sector (Including Livestock):

Agriculture sector (Including Livestock) includes Agriculture (Farm Crops) and Livestock. Agriculture (Farm Crops) has crop group:

Cereal, Pulses, Oil seed, Sugarcane, Fibers, Dyes & Tanning Material, Drugs & Narcotics, Spices, Fruits & Vegetables, Misc. Crops, By Products, Floriculture & Backyard

For Farm Sector production, price and some rates and ratios are used to estimate value of various crops from group and then aggregated to obtain GVO.

Livestock covers:

Milk, Egg, Meat, Wool & Hair, Dung, Silkworm coon & Honey, Increment in Livestock

Production, price and certain rates & ratios (Meat components, Wool etc.) are used to estimate value of output for each item under Livestock. Production and prices data are taken from DADF, M/o Agriculture, Govt. of India, DES (States). No separate GVA for Farm Sector and Livestock Sector are compiled due to inseparable inputs. Feed of Livestock and Repairs and Maintenance are among the inputs, which as on date are not separable. From aggregate GVO of Agriculture and Livestock, Value of inputs is deducted to obtain Gross Value Added (GVA).

Inputs Estimation of Agriculture (including Livestock):

Input - includes:

Seed, Chemical Fertilizer, Organic Manure, Current Repair & Maintenance, Feed of Livestock, Irrigation Charges, Market Charges, Electricity, Pesticides & Insecticides, Diesel Oil, and FISIM (Financial Intermediation Services Indirectly Measured).

Organic farming in India has been growing impressively despite the lack of support from governments. Some state governments are taking small steps forward and best practices from these states are worth replicating elsewhere. Learn about these, and influence your own governments to scale up support to food and farming systems!

The government of India is stepping up by beginning to invest heavily in sustainable agriculture:

In India the most ambitious such exercise undertaken is called the National Mission on Sustainable Agriculture. It has a budget outlay in the 12th Five-year plan (2012-2017) as Rs. 130 billion (approx USD 21 billion) – that is about 11% of the total agricultural budget of the country.

Supply Chain Bottlenecks:

The organic products supply chain in India is very complex and wide, driven by importers and exporters while the weakest links are the farmers and the laborers. A major weakness here is the serious lack of adequate information sharing and communication down the supply chain. Moreover, the organic market is not consumer demand based, but supply driven, which leads to numerous threats. The biggest hazard is that all kinds of products are offered under declarations such as 'without pesticides', 'eco-friendly' or even 'organic'. In this sense, most threats are related to the problem of faithful declaration, the role of government, and clarification of the term 'organic'.

The traders and processors face problems of inconsistent supplies, insufficient volumes, lack of quality storage, lack of market information, under developed domestic market, and high quality conditions for export. The problem of multiple certifications for domestic and international markets and for different buyers also raises the cost and delays deliveries. Non-existence of any pricing policy for organic products is also a major issue in the Indian organic products supply chain.

Although on the brighter side, the awareness regarding pesticide residues, presence of international and national certification bodies and support of Indian government are the key strengths. Apart from support from the government, private sector Civil Society Organizations are also involved in promotion of organic farming, capacity building of farmers, traders, exporters, marketing executives on the various aspects of organic farming (marketing, child labor, fair trade, quality assurance).

Marketing of organic products needs to take into account local markets, developing niche markets, generic promotion of the organic products market. Further, for the sustainability of company-farmer partnership schemes, it is important that a

company is able to successfully market its products so that farmers do not suffer from a lack of the same.

So far as the role of the government in the commodity chain is concerned, it can proactively help the stakeholders in the chain to identify the opportunities and threats in the global commodity chains. Certification system for organic products should be simplified and made transparent in order to ease the supply chain.

The challenges faced:

The challenges faced by domestic Farmers markets are consumer confusion about organic agriculture, price competition and retailers who are unconcerned about differentiating organic products. Consumers are confused about organic agriculture vis-à-vis other product attributes, resulting in their unwillingness to pay higher prices for organic produce. As prices of conventional products are relatively low, organic products cannot be priced much higher. So, efficiency and cost reduction are critical issues for the competitiveness of organic projects targeting the domestic market. The dominance in retailing of modern supermarket chains and discount stores results in a focus on price competition and cheap rather than quality products on sale. Supermarkets have little interest in promoting organic products at a premium, which explains the slow growth of organic market development in India. The main challenges for agro-ecological farmers in India relate to whether the direct marketing approaches being used at present will become saturated in the future, supply will exceed demand and producers will receive lower prices. At this point, they will have to deal with conventional markets and their demands for volume, quality, consistent supply and price. In those cases where retail markets are already being served, efforts will need to be made to promote the differentiation of organic or agro-ecological produce, so that a premium can be received in return for the values and environmental benefits inherent in the product. The already close links to government programs should be explored to undertake this consumer and retailer education challenge.

Supply Chain Challenges:

Supply Chain Challenges across the supply chain are not necessarily exclusive to organic food. Conventional food also is affected by factors such as problems with the supply chain or inventory management. Organic farming, however, has unique challenges related to the cost and logistics of moving locally or regionally produced organic produce to the market. The concept of food mileage, which refers to the distance food, is transported from the time of its production until it reaches the consumer, gains prime importance in the case of organic food. The situation of small and medium farms is also to be noted. Currently, the production of produce in small to medium farms is rather limited, amounting to a few hundred tons. Such farms are not very lucrative for mainstream grocery chains.

Further, many buyers seem to be ambivalent about channels of distribution. For some buyers, on the other hand, trust is the vital component for deciding whether to buy food products via a particular avenue. In fact, often consumers are not convinced about the value of buying organic food. Consumer consumption decisions regarding food products could, however, be hugely impacted by food mileage, price and the certification process. Lastly, there is a large knowledge gap spanning the marketing system in place, the value chain and the value delivery network (i.e., supply chain network) in the food system.

Conclusion

The agriculture sector in India is expected to generate better momentum in the next few years due to increased investments in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Factors such as reduced transaction costs and time, improved port gate management and better fiscal incentives would contribute to the sector's growth. Furthermore, the growing use of genetically modified crops will likely improve the yield for Indian farmers.

These **logistical challenges** make it difficult to bring a reliable flow of fresh produce to urban consumers and it is also one of the reasons that drive up the prices of food produce. Need to be done: knowledge sharing about sustainable alternatives in agriculture and networking amongst farming communities.

Inter-connectedness to the global supply chains is the final step in the journey.

When we talk of efficient supply chains in farm produce we must start with the market structure itself where currently we have small farmers and small trades based on spot prices. This must move through vertical integration into farmer groups who create supply contracts with some pricing arrangement that is long term. The exchange relationship is crucial for success and as the contracts move to long term from short term, it helps to lock in both sides with a much firmer plan than the current volatility. Moving from public R&D to private R&D is the next step in the process that makes the farm produce move to the higher levels of differentiation.

The value of farm produce needs to be first well distributed across the supply chain, followed by better information networks and capital allocation systems that would work on supply contracts that would be based on risk sharing. The result can be provided by centralized logistics systems that would create the optimum infrastructure by phasing out inefficient low quality high cost modes.

Globalization and economic protectionism continue to shade the spirit of free trade and the laws of supply and demand. The trend toward local food sourcing presents an organic way to stimulate domestic consumption-preserving an economic lifeline for local growers that can't otherwise compete in the global export market.

As the world is moving towards more Safe food, Healthy food, Food as the medicine, Climate change concern, Environmental concern, Animal Welfare concern, it is only natural that farm produce is at the cusp of a phenomenal transformation, where rapid industrialization can happen only if we could work on the making the supply chain efficient.

By being fully integrated across all business processes and geographies, supply chain can help the truck industry in India achieve technological advancements and automation, which will result in cost effectiveness as well as business efficiencies. Business impacts will be enhanced and so will customer experiences. A seamless process will result in holistic development.

India cannot afford to miss out in this journey, especially when it is just about taking off in the logistics space with better infrastructure possibilities. Integrated supply chain management of farm produce is the only way the full value can be distributed right across the chain.

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