



Supply Chain Management in Rajasthan Agriculture Sector

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Abstract:

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! making it the second largest fruit producer in the world. India's horticulture output, comprising fruits, vegetables and spices, has reached to a record high of 283.5 million tonnes (MT) in 2014-15. 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.

Key Words: *GDP, Foodgrain, FDI, FMCG.*

Introduction:

India produced around 81.285 MT fruits and 162.187 MTs of vegetables which accounts for nearly 14.0% of country's share in the world production of vegetables. Although, more than 70 types of vegetables are grown in our country, higher emphasis is given to more popular vegetables like tomato, brinjal, chilli, cauliflower, cabbage, peas, potatoes, onions and few common cucurbits and leafy vegetables. These also generate high income and employment, particularly for small farmers. Among the vegetables, potato is cultivated over large area



followed by onion, tomato and brinjal whereas, in the case of production potato ranks first followed by tomato, onion and brinjal. Though India has lot many positives in the vegetable production and marketing sector, it has several disadvantages too. The country lacks an efficient supply chain for the distribution of the fruits and vegetables. Supply chain management plays an integral role in keeping business costs minimum and profitability as high as possible. There are many factors involved in supply chain management of which flow is one of the most important factor. Flow includes the product flow, the information flow and the finances flow. The product flow includes the movement of goods from a supplier to a customer, as well as any customer returns or service needs. The information flow involves transmitting orders and updating the status of delivery and the finance flow includes all the financial aspect such as invoices and payments. The present challenge in supply chain management is to maintain all three flows in an efficient manner, resulting in optimal results for farmers, growers, wholesalers and customers.

1. 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 3rd Advance Estimates, India's foodgrain production has increased marginally to 252.23 million tonnes (MT) in the 2015-16 crop year. Production of pulses is estimated at 17.06 million tonnes.

With an annual output of 146.31 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 40,000 crore (US\$ 5.87 billion)



annually, of which the branded segment accounts for 15 percent. In fact, the Spices Board of India has decided to set up a spice museum at Willingdon Island in Kochi to attract and educate tourists and seafarers about the history and growth of Indian spices industry.

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

2. Investments

Several players have invested in the agricultural sector in India, mainly driven by the government's initiatives and schemes.

According to the Department of Industrial Policy and Promotion (DIPP), the Indian agricultural services and agricultural machinery sectors have cumulatively attracted Foreign Direct Investment (FDI) equity inflow of about US\$ 2,261 million from April 2000 to December 2015.

Some major investments and developments in agriculture in the recent past are as follows:

- ITC Ltd, one of India's leading fast-moving consumer goods (FMCG) company, plans to make Andhra Pradesh a hub for its agricultural business operations.
- Mahindra and Mahindra Ltd has acquired 35 per cent stake in a Finnish combine harvesters manufacturer, Sampo Roselnew Oy, for US\$ 20.46 million and will jointly focus on the combine harvester business in Asia, Africa and Eurasian Economic Union countries.
- The Small Farmers' Agri-Business Consortium (SFAC) plans to organise camps in Madhya Pradesh and Chhattisgarh to promote its venture capital assistance scheme (VCAS), which seeks to provide capital and project development facility (PDF) to agri-business entrepreneurs.
- Agri-research institute ICRISAT's incubation arm is looking to set up a Rs.100 crore (US\$ 14.67 million) fund in a year, an initiative that could help small entrepreneurs from the agri-business and nutrition space raise money.
- Mahindra & Mahindra (M&M), India's leading tractor and utility vehicle manufacturer, announced its entry into pulses retailing under the brand 'NuPro'. Going forward, the company plans to foray into e-retailing and sale of dairy products.



- Fertiliser cooperative IFFCO launched a joint venture with Japanese firm Mitsubishi Corp for manufacturing agrochemicals in India.
- Acumen, a not-for-profit global venture fund, has invested Rs 11 crore (US\$ 1.7 million) in Sahayog Dairy, an integrated entity in the segment, based at Harda district in Madhya Pradesh.
- Rabo Equity Advisors, the private equity arm of Netherlands-based Rabo Group, raised US\$ 100 million for the first close of its second fund – India Agri Business Fund II. The fund plans to invest US\$ 15–17 million in 10–12 companies.
- Oman India Joint Investment Fund (OIJIF), a joint venture (JV) between the State Bank of India (SBI) and State General Reserve Fund (SGRF), invested Rs 95 crore (US\$ 13.94 million) in GSP Crop Science, a Gujarat-based agrochemicals company.
- The world's seventh-largest agrochemicals firm, Israel-based ADAMA Agrochemicals plans to invest at least US\$ 50 million in India over the next three years.

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 (US\$ 42.11 billion) 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 recognises the importance of microirrigation, watershed development and ‘Pradhan Mantri Krishi Sinchai Yojana’; thus, it allocated a sum of Rs 5,300 crore (US\$ 777.6 million) 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.

The Department of Agriculture and Cooperation under the Ministry of Agriculture has inked MOUs/agreements with 52 countries including the US. In addition, the Department of Agriculture Research & Education (DARE) and the Department of Animal Husbandry, Dairying & Fisheries (DAHD&F) under the Ministry of Agriculture have signed MOUs/agreements with other countries, taking the number of partnerships with other countries to 63. These agreements would provide better agricultural facilities in areas such as research and development, capacity building, germ-plasm exchange, post-harvest management, value addition/food processing, plant protection, animal husbandry, dairy and fisheries. The agreements could help enhance bilateral trade as well.

Given the correlation between improvement in agriculture and the development of the country, the Government of India adopted several initiatives and programmes to ensure continuous growth. It allocated Rs 25,000 crore (US\$ 3.67 billion) for the Rural Infrastructure Development Fund (RIFD), Rs 1,500 crore (US\$ 220 million) for the long-term rural credit fund, Rs 45,000 crore (US\$ 6.60 billion) for the short-term cooperative rural credit finance fund and Rs 25,000 crore (US\$ 3.67 billion) for the short-term Regional rural bank (RRB) refinance fund. It also marked an ambitious target of Rs 8.5 lakh crore (US\$ 124.71 billion) of agriculture credit during 2015–16.

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 (US\$ 440.15 million) for a period of five years.

- Mr Piyush Goyal, Minister of Power, Coal, New and Renewable Energy has announced that government's plans to invest Rs 75,000 crore (US\$ 11.08 billion) in an energy-efficient irrigation scheme over the next three to four years.
- The new crop insurance scheme for farmers 'Bhartiya Krishi Bima Yojana' aims to cover 50 per cent of the farmers under the scheme in the next two-three years,
- India and Lithuania have agreed to intensify agricultural cooperation, especially in sectors like food and dairy processing.
- Gujarat Government has planned to connect 26 Agricultural Produce Market Committees (APMCs) via electronic market platform, under the National Agriculture Market (NAM) initiative.
- The State Government of Telangana plans to spend Rs 81,000 crore (US\$ 11.88 billion) over the next three years to complete ongoing irrigation projects and also undertake two new projects for lifting water from the Godavari and Krishna river.
- The National Dairy Development Board (NDDB) announced 42 dairy projects with a financial outlay of Rs 221 crore (US\$ 32.42 million) to boost milk output and increase per animal production of milk.
- Government of India has set up an inter-ministerial committee, which will look into ways to examine the potential of Indian agriculture, identify segments with potential for growth, and work towards doubling farm incomes by 2022.
- The Government of India has allocated Rs 200 crore (US\$ 29.9 million) for electronically linking 585 major wholesale agriculture markets across the country, thereby creating a National Agriculture Market (NAM). in July 2015 for three years.

Main Objective of the Research Work

The objective of the study is to evaluate the impact of the Integrated Logistics behaviour in Agriculture Sector on the socio-economic life. In this study the focus on the inefficiencies in the agricultural sector and better plan and coordinate the movement of food products. The objective has been divided into following sub-objectives for a detailed study:

1. To determine the extent of reduction in the Post harvest losses of farm produce.
2. To study the extent of additional income generated due to the creation of the rural godowns.



3. To study the extent of the capacity utilization of the Rural godowns.

3. Importance of Proposed Research Work

“Logistics is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost-effective fulfilment of orders.

There are a number of theories and methods that are described in the business literature about how to succeed today and stay competitive in the future. Companies must recognise that the competition today is through their capabilities and competencies. By managing their core processes better than competitors manage theirs, organisations can create superior value for customers and consumers. The core processes include such activities as new product development, supplier development, order fulfilment, and customer management. If an organisation can perform these activities in a more cost-effective way than the competitors, the organisation will gain the advantage at the marketplace.

With the use of logistics management, the goal is to link the marketplace and the operating activity business in such a way that customers are served at higher levels and at a lower cost. A broader definition of logistics management that is widely used comes from The Council of Logistics Management (CLM) and is as follows:

“Logistics management is that part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods, services, and related information from the point-of-origin to the point-of-consumption in order to meet customers’ requirements. Materials can be raw materials, components, parts, tools, consumables, services or any other types of item.

The material flow represents the supply of product through the network in response to demand from the succeeding organization. Often it is difficult to see where the flow starts in the chain and where it ends. The negative effect of this is the build-ups of inventory and slow response to demands of the end customer Logistics is a cross-functional subject cutting across functional boundaries of the organization in focus into the supply chain. This implies the complexities of synchronizing the movement of materials and information between business processes.



The system's nature of logistics has proved a particularly difficult lesson to learn, and individual organizations still often think that they can optimize profit conditions for themselves by exploiting others in the supply chain. The emergence of logistics has therefore been dependent on the development of a cross functional model of the organization and there has to be an understanding of the need to integrate business processes across the supply chain, both internally and externally. The future competitive advantage will come from responding to customers at the end of the supply chain better than competitors do, and in this response, logistics play a key role.

4. Review of Literature (Present and Past Status)

Since logistics advanced from 1950s, due to the trend of nationalization and globalization in recent decades, the importance of logistics management has been growing in various areas. For industries, logistics helps to optimize the existing production and distribution processes based on the same resources through management techniques for promoting the efficiency and competitiveness of enterprises.

The key element in a logistics chain is transportation system, which joints the separated activities. Transportation occupies one-third of the amount in the logistics costs and transportation systems influence the performance of logistics system hugely. Transporting is required in the whole production procedures, from manufacturing to delivery to the final consumers and returns. Only a good coordination between each component would bring the benefits to a maximum.

The study focuses on:

- Development of logistics
- Transport-related sectors based on a historical review
- Interrelationships of transportation and logistics
- Benefits of transportation to logistics activities and vice versa
- Major logistics activities and concepts
- Potential further development of logistics systems

i) Overview of Logistics



Logistics is part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements. It is describing the entire process of materials and products moving into, through, and out of firm. Inbound logistics covers the movement of material received from suppliers. Materials management describes the movement of materials and components within a firm. Physical distribution refers to the movement of goods outward from the end of the assembly line to the customer. Finally, supply-chain management is somewhat larger than logistics, and it links logistics more directly with the users' total communications network and with the firm's engineering staff. It is a process of moving and handling goods and materials, from the beginning to the end of the production, sale process and waste disposal, to satisfy customers and add business competitiveness. It is also a process of anticipating customer needs and wants; acquiring the capital, materials, people, technologies, and information necessary to meet those needs and wants; optimizing the goods- or service-producing network to fulfill customer requests; and utilizing the network to fulfill customer requests in a timely way. It is Customer-oriented operation management.

ii) Components of Logistics System

The closely linked components of the logistics system are:

Logistics services:

Logistics services support the movement of materials and products from inputs through production to consumers, as well as associated waste disposal and reverse flows. They include activities undertaken in-house by the users of the services (e.g. storage or inventory control at a manufacturer's plant) and the operations of external service providers. They comprise physical and non-physical activities (e.g. transport, storage and supply chain design, selection of contractors, freightage negotiations respectively). Most activities of logistics services are bi-direction.

Information systems:

Information systems include modeling and management of decision making, and more important issues are tracking and tracing. It provides essential data and consultation in each step of the interaction among logistics services and the target stations.

Infrastructure/resources:

Infrastructure comprises human resources, financial resources, packaging materials, warehouses, transport and communications. Most fixed capital is for building those infrastructures. They are concrete foundations and basements within logistics systems.

iii) History and Advancement of Logistics

The probable origin of the term logistic is the Greek *logistikos*, meaning 'skilled in calculating'. It was initially developed in the context of military activities in the late 18th and early 19th centuries and it launched from the military logistics of World War II. It was initially a military activity concerned with getting soldiers and munitions to the battlefield in time for flight. Military typically incorporate the supply, movement and quartering of troops in a set. The main background of its development is that the recession of America in the 1950s caused the industrial to place importance on goods circulations. Now it is seen as an integral part of the modern production process. Business logistics was not an academic subject until the 1960s. A key element of logistics, the trade-off between transport and inventory costs, was formally recognized in economics at least as early as the mid-1880s. Based on the American experience, the development of logistics could be divided into four periods, which are represented as Figure.

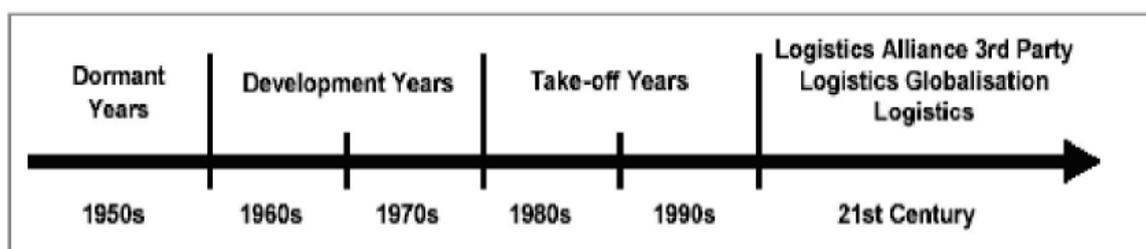


Figure: Logistics historical development

Before the 1950s, logistics was under the dormant condition. Production was the main part of the managers concerned, and industry logistics was once regarded as "necessary evil" in this period. During the 1950s to and 1960s, applying new ideas of administration on business was a tendency.



Due to petroleum price rise in 1973, the effects of logistics activities on enterprises grew. Slow growth of market, pressure of high stagflation, release of transportation control, and competitions of the third world on products and materials all increased the significance of logistics system on planning and business at that time.

The further tendency of logistics in the early 21st century is logistics alliance. Third Party Logistics (TPL) and globalize logistics. Logistics circulation is an essential of business activities and sustaining competitiveness, however, to conduct and manage a large company is cost consuming and not economic. Therefore, alliance of international industries could save working costs and cooperation with TPL could specialize in logistics area.

iv) Agricultural Logistics

Agriculture is the backbone of the Indian economy which contributes a major share of the National income. Being an agrarian country, nearly 75% of the country's population depends directly or indirectly on agriculture. Over the years, the country witnessed a historic change-over from a subsistence agricultural production to market oriented surplus. Today agricultural sector occupies a strategic place in India's economic development. The production of food grains increased considerably from 50.8 million tons in 1950-51, i.e., beginning of the first Five Year Plan to an all time record of 250.67 million tonnes by the end of 2012-2013.

However, for a long period of time Indian agriculture was mostly in the nature of subsistence farming. The farmers sold only a small part of their produce to pay-off rents, debts and meet other requirements. Such sale was usually done immediately after the harvesting of crops since there were no storing facilities. A major portion of the total produce was sold by the farmers to the village traders and money lenders often at prices much lower than the market prices through middlemen. As a result, the return from agricultural produce to farmers was meagre. As a consequence of no warehousing facilities in the villages, the farmer was compelled to store his produce in pits, mud-vessels and traditional store houses. These unscientific method of storing led to considerable wastage. At times, as much as one-third of farmers produce was lost in this way. It was therefore, felt that in order to avoid exploitation of producers by the traders, and to preserve the produce from the ravages of insects and pests during post-harvest period, the infrastructure of warehousing facilities has to be taken

to the rural areas. Likewise, as stated earlier, due to record production of food grains, the marketable surplus do posed a challenge to provide requisite storage and warehousing facilities for proper upkeep and distribution of the commodities. As such, storage of food grains is necessary to bridge the time gap between periodic harvest and marketing.

Conclusion:

The agriculture sector comprises of a number of inter-related value chains.

- a) Agriculture Value Chain: The agriculture supply chain starts with the farmer who harvests food crops. The farmer sells its harvest to intermediaries such as regional agents, who comprises of millers and end consumers wholesalers, who in turn sell to distributors, retail shops and fair price shops who distribute the produce to the end consumer.
- b) Supporting Manufacturing Services: The supporting value chain for agriculture comprises fertilizer producers and distributors, grain distributors, tractor, and farm equipment manufacturers. Logistics services play an important role in getting these goods to the farmer and in supporting the production of food crops. Financial institutions, Insurance agents, government agencies and other organizations play important supporting roles as well.
- c) Processed Food Value Chain: The processed food value chain is responsible for converting food grains into processed/canned foods and getting it within reach of end consumers. Increasingly ready-to-eat food products are being targeted by a number of large manufacturing and the retail distribution companies. Also, linking the chain restaurants with the grain producers can induce efficiencies.

Even though the Indian economy is driven by the agricultural sector, minimal attention is paid to the logistics in the agricultural sector. Furthermore, the problem is complicated by the fact that the bread baskets of India are quite distant from the urban consumer base. Herein exists an opportunity for a logistics service provider to focus on the inefficiencies in the agricultural sector and better plan and coordinate the movement of food products across the country.

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