
UNIT 1 INTRODUCTION TO AGRICULTURAL VALUE CHAIN

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1.0 OBJECTIVES

After studying this unit, you should be able to:

- define value chain, agri value chain;
- outline various components of the agri-value chain;
- describe the role of various stakeholders involved in the agri value chain;
- identify the opportunities and challenges of the agri-value chain; and
- explain the concept of agri-value chain management and agri-value chain finance.

1.1 INTRODUCTION

Dear learners,

In previous courses, you learnt how to apply cost and accounting concepts, tools and techniques in agribusinesses. Every business needs to know how to manage its resources effectively. So, the course mainly deals with farm management. A value chain is one of the important aspects of farm management. This unit shall introduce various issues of the value chain and how the value chain works for an agricultural business.

In India, generally, farmers face the problems of poor access to quality seeds, inefficiencies in using modern cultivation methods, and also poor access to quality infrastructure. In most cases, small farmers face many challenges including marketing of their products, supply chain and related issues. The supply chain in India is inefficient, fragmented, and excessively long, with a lot of unwanted intermediaries. Small farmers are at a disadvantage because they are forced to buy retail inputs (e.g., fertilizers, seeds and pesticides are bought at higher prices) but sell output in wholesale markets. They have a very small marketable surplus. In these situations, the agri value chain plays an important role.

However, at first, you will know what is value chain and why it is important in agriculture. The term value chain refers to the process in which businesses receive raw materials, add value to them through production, manufacturing and other processes to create a finished product, and then sell the finished product to consumers. This concept applies to all types of organizations including agriculture-related firms. So, you have to know how the value chain works for an agri farm to increase its profitability. When you apply this 'value chain' concept in an agri farm, then it will be known as an 'agri value chain'.

In this unit, you will learn concepts of the value chain as well as agri value chain, its various components, various stakeholders involved in the agri-value chain, and the idea of agri-value chain management and finance. Further, this study will cover the role of Information and Communication Technology (ICT) and the emergence of digital opportunities across the agricultural value chain.

1.2 VALUE CHAIN

The value chain concept was first described in 1985 by Harvard Business School professor Michael Porter, in his book *Competitive Advantage: Creating and Sustaining Superior Performance*. According to Michael Porter, a value chain is a set of activities that an organization carries out to create value for its customers. This concept of value chain can be applied in agriculture. The chain identifies each step in the process at which value is added, including the sourcing, farming, and marketing stages of its production. In other words, the value chain concept is based on the process view of organisations, which considers a producing (or service) firm as a system comprised of subsystems, each having inputs, transformation processes, and outputs.

Porter also stated that the appropriate level for constructing a value chain is the business unit, not the division or corporate level. Products pass through a chain

of activities in order, and at each activity, the product gains some value. The chain of activities gives the products more added value than the sum of added values of all activities.

A firm's value chain forms a part of a larger stream of activities, which Porter calls a value system. A value system of a farm value chain includes the suppliers that provide the inputs necessary to the firm along with their value chains. After the firm creates products, these products pass through the value chains of distributors (which also have their own value chains), all the way to the customers. All parts of these chains are included in the value system. To achieve and sustain a competitive advantage, and to support that advantage with information technologies, a firm must understand every component of this value system.

You can apply a value chain for any type of organization. Porter described the primary and support activities of a value chain which is shown in Figure 1.1. All the primary and support activities are discussed in detail in section 1.4 of this unit.

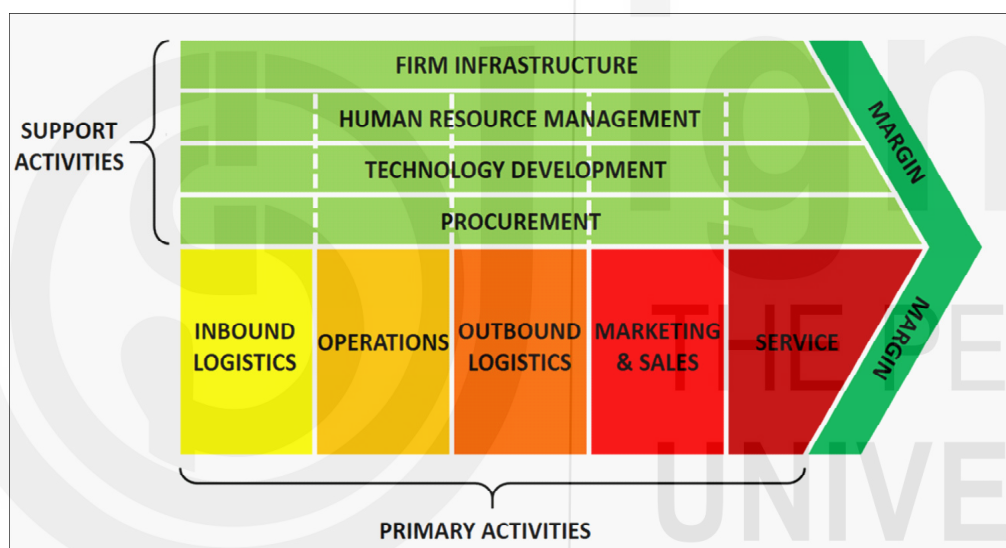


Fig. 1.1 Michael Porter's Value Chain

Source: Porter, (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*

As per the value system, like other businesses, also agri-business activities can be divided into two categories, primary activities and support activities. These are discussed below:

1.2.1 Primary Activities

Primary activities consist of five components, and all are essential for adding value and creating competitive advantage:

- (i) **Inbound logistics:** It includes functions like receiving, warehousing, and managing seeds, fertilizers, pesticides etc.
- (ii) **Operation:** It includes procedures for converting raw materials into a finished product such as pulp, jams, jellies, juice, pickles, etc.

- (iii) **Outbound logistics:** It includes activities to distribute a final product to a consumer.
- (iv) **Marketing and sales:** It includes selling products and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.
- (v) **Service:** It includes programs to maintain agri products and enhance the consumer experience - like timely delivery, customer service, refund, and exchange.

1.2.2 Support Activities

The purpose of support activities is to increase the effectiveness of the primary activities. When we increase the efficiency of any of the four support activities, it benefits at least one of the five primary activities mentioned above.

- (i) **Procurement:** It concerns how a company obtains raw materials.
- (ii) **Technological Development:** It is used for agri firm's research and development (R&D) purpose - like developing modern cultivation technology etc.
- (iii) **Human Resources (HR) Management:** It involves hiring and retaining labourers who will fulfil the agri firm's strategy and help in selling the agri product.
- (iv) **Infrastructure:** It includes all the infrastructural supports that are required for any agri farm.

Agri Value Chain constitutes all the above-mentioned activities. But it can be remembered that the value chain of an organization is influenced by the nature of the particular farm, and the availability of resources. Further, it is also influenced by different external factors such as political, economic, social, technological, environmental, and legal factors.

1.3 AGRI VALUE CHAIN

In this section, the following issues are discussed:

1.3.1 Definition of Agri Value Chain

In simple terms, agri value chain means the application of a value chain in any agri farm or agri business. Normally people think the agri value chain is a separate concept. But it is not true. It can be said that the Agri value chain describes the whole range of actions necessary for moving agricultural products from conception through the intermediate stages of production, delivery to end consumers, and final disposal after usage.

Dear learners, one thing you have to remember is that the persons who are involved in this process are known as actors or chain actors. The chain actors who actually transact a particular product as it moves through the value chain include input (e.g., seed suppliers), farmers, traders, processors, transporters, wholesalers, retailers and final consumers.

1.3.2 Process of Agri Value Chain

India's agricultural sector is a major contributor to the country's economy. The agricultural sector is also a major driver of rural development, as it provides a source of income and livelihood for millions of people. Over the past few decades, India's agricultural sector has undergone a significant transformation. From this point of view, the value chain is very important for us which is shown in Figure 1.2 below.



Fig. 1.2: Process of an Agri (Food) Value Chain

Source: <https://gramworkx.medium.com/the-agricultural-value-chain-its-challenges-and-opportunities-in-india-6fb433bb0e7a>

From the above figure, we find the different stages (functions) of a simple agri-value chain.

Step 1: Supply of input for the production.

Step 2: Then production or farming activities by the farmers.

Step 3: After production and farming, the next step is harvesting and collecting activities by the farmers for their production.

Step 4: Processing is another important activity in the value chain. It involves the transformation of raw materials into usable finished products either manual or mechanized system.

Step 5: Once the processing of a product is completed, the next step is the packaging of the product. Packaging could be made in such a way that buyers or consumers may understand your product description, price and other aspects of products.

Step 6: After packaging, your product is ready to sell in the market.

There are different players involved in this value chain activity including raw suppliers, producers, harvesters, processors, wholesalers, transporters, and other players. Of course, all links are affected by the national and global policy environment.

Let's take an example to understand the value chain in a real-life situation.

Domestic Mango Value Chain

For example, we can mention about domestic mango value chain. However, a typical mango value chain model is depicted in Figure 1.3.

The first stakeholder in the mango value chain is the Pre-Harvest Contractor (PHC) which enters into a contract with a farmer around four months before the harvest season, based on the flowering of the trees. The PHC enters into contracts with several farmers to achieve economies of scale by being an aggregator.

In the next step, PHC transports the harvested mangoes to the wholesale markets in big cities or consumption centres. These markets or mandis where commission agents are registered with those wholesale markets buy the mango consignment from PHC.

Lastly, retailers - small vendors or neighbourhood retailers sell the fruits to consumers after buying from the commission agents. Although small vendors and neighbourhood markets are still the main outlets for fruits and vegetables, there are several organized retailers or supermarkets that are expanding their base.

Mangoes going for exports do not follow this value chain. After completing several legal procedures, the exporters who are registered with wholesale markets buy from the farmers and export the goods. The mandis and PHCs are not involved as exporters directly purchase the mangoes from the farmers to ensure the quality standard. This process is shown in Figure 1.3 below:

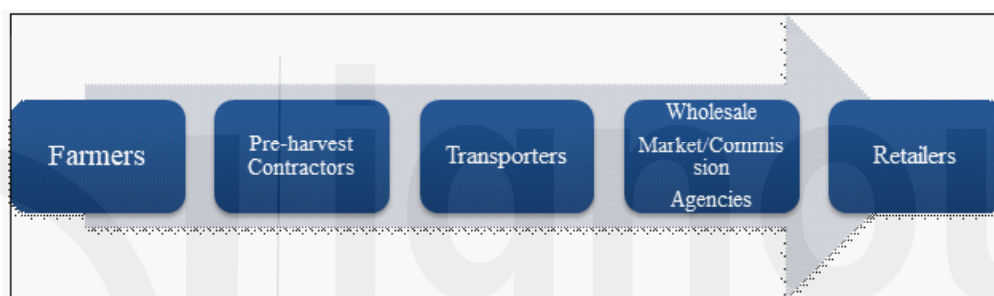


Fig. 1.3: Simplified Value Chain for Fresh Mangoes

Source: <https://www.nabard.org/auth/writereaddata/tender/1112235854nrs33-an-analytical-study-of-value-chain-financing-to-high-value-agriculture-in-eastern-up.pdf>

Following the same way, we can also calculate the cost of the cultivation of mango to assess the financial sustainability of the value chain.

1.3.3 Importance of Agricultural Value Chains

You are aware that after Covid 19 Pandemic, the agribusiness environment is becoming increasingly volatile in the present VUCA (Volatility, Uncertainty, Complexity and Ambiguity) world. This rapid change stems from several different sources: the changing climate, political actions and social changes. You know that the weather has been responsible for fluctuating yields and a supply shortfall which has put pressure on crop prices. So, setting the appropriate strategy for the value chain in agribusiness is very important. At present, the sustainability of the value chain is also a considerable issue.

The importance of the Agri value chain is as follows:

- (i) It helps to identify the stakeholders and their activities (primary and supportive) in the whole agriculture process.
- (ii) It identifies the actors involved in the value chains including their roles and interactions.
- (iii) It measures the efficiencies in the cultivation and marketing of their products and understands the demand for their products.

- (iv) It estimates the marketing costs and marketing efficiency in the value chains.
- (v) It identifies the potential for value addition in different stages.
- (vi) It estimates the product-wise value addition in processing like jelly, jam and ketchup from mango and tomato.
- (vii) It examines investment requirements and technology support to establish a value chain.
- (viii) It suggests suitable strategies for the improvement of their agribusiness.

1.3.4 Developing Agri Value Chain in India

Agri-value chain is a complex system to understand and the numerous underlying challenges and constraints are involved. So, analysis of the value chain is a critical task for any agri farm. Macroeconomic conditions and the external environment in the form of policies, laws, standards, regulations, and institutional support services have a significant impact on the performance of value chains. Agri-value chains require innovative financing products.

For example, small farmers who grow fruits and vegetables for export can access funds to buy agrochemicals on the strength of their supply contracts. Even, farmers may deposit their grains in a certified warehouse and they can obtain loans for buying farming inputs at the right time without having to sell their crops at a low price. Such financing arrangements within agri-value chains are becoming increasingly common and important. They need further exploration and application within India. Expansion of financing models is necessary. Contractual farming, warehouse receipts, collateral management, supply and structured commodity finance, are all emerging options.

Key areas of innovation that require support and need to be incubated and replicated include Information and Communication Technology (ICT), risk management tools (insurance schemes, enhanced service provisions), group aggregations (FPOs, farmer's associations), greater use and inclusion of the national spot and future exchanges.

The National Bank for Rural Development (NABARD) has several rural development funds such as the Rural Infrastructure Development Fund, Warehousing Infrastructure Fund, and the Gramin Bhandaran Yojana of the Ministry of Agriculture, specifically for value chains.

1.4 REQUIREMENTS OF AGRICULTURAL VALUE CHAIN

Once the architecture for the value chain is laid out, then financing and marketing play a crucial role. Five critical enablers that are required for this architecture are as follows:

- (i) **Social mobilization:** Social mobilization is very important if small and marginal farmers are to be involved in the value chain process.
- (ii) **Technologies to interact with small farmers:** Technologies and information services that can connect small farmers have not received adequate attention. The NABARD has mobilized the country's largest

poverty eradication and social mobilization program through self-help groups but even this movement is constrained by the absence of technology and seamless communication with small and marginal farmers in remote rural areas. To procure what these small producers produce, a technology-driven architecture for communication is necessary.

- (iii) **Creating infrastructure in rural areas:** Any value chain we create, bank on or link our farmers to must have roads, irrigation facilities, electricity, sector-specific infrastructure for dairy, poultry, custom hiring, warehouses, etc.
- (iv) **Crowd solutions:** While success has been achieved in small pockets, large-scale programmes for value chain funding with the involvement of small and marginal farmers are missing. Creating a common platform for showcasing solutions and best practices from isolated and pilot cases should be integrated into the form of a crowd-sourced solution for better dissemination.
- (v) **Data management:** Data gathering, analytics and concerted research activities on the aggregation of small and marginal farmers for agri-value chains is a must. 60–70 crore people live in rural areas and any research related to them requires a huge momentum.

Check Your Progress 1.1

Note: a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1. Which of the following is/are the outbound logistics activities?
 - a. Delivery
 - b. Finished goods warehousing
 - c. Order processing and scheduling
 - d. All of the above

2. List three primary activities of the value chain model.

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3. Identify at least three support activities of the value chain model.

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1.5 STAKEHOLDERS IN THE AGRI VALUE CHAIN

Agri Value Chains represent a complex network of inputs and outputs that link farm production inputs to food consumers. They involve a wide range of stakeholders. Various stakeholders of an Agri Value Chain are mentioned below (Figure 1.4):



Fig. 1.4: Stakeholders Involved in Agri Value Chain

(Source: *Supply Chain Management in Agriculture, Reading Material by National Institute of Agricultural Extension Management*)

- 1. Input farms:** Input suppliers are essential to the agri value chain because they facilitate in many ways. They provide good quality planting materials to the farmers. They supply inputs such as seeds, fertilizers, pesticides etc.
- 2. Framers, Land Owners and Pre-harvest Contractors (PHC):** The most significant roles in the agri value chain are played by framers, landowners and pre-harvest contractors. Farmers are involved in cultivation activities. These farmers may or may not be the owners of the land. The land owner may lease out the land on a contract basis for a particular period of time to farmers. Whereas, a pre-harvest contractor takes the field or garden for lease on a contract basis for a pre-fixed rate and undertakes the harvesting activities and markets the produce. So, they are the important parts of an agri value chain.
- 3. Collection agents:** They own individual collection units or sheds. They procure agricultural produce like grains, pulses, oilseeds, cotton, fruits, vegetables etc. directly from the producers. Sometimes, they are farmers themselves and they market their produce through their shed along with the produce of other farmers.
- 4. Processors:** They convert the raw product into value-added products such as pulp, jams, jellies, juice, pickles, and other canned products.
- 5. Traders:** They are large merchants. They procure agri products either directly from large farmers or through the collectors and distribute them to distant market suppliers.
- 6. Retailers:** They are the fruit stall owners, roadside vendors and supermarkets from where the consumers buy the products. They may sell the produce as such or after value addition and processing.

7. **Exporters:** Exporters are involved in international trade. They supply high-quality products to other countries by taking into account their quality implications.
8. **Consumers:** They are the end users of the agri products.
9. **Development personnel:** They are the extended workers of institutions such as Krishi Bhavan, research stations, Universities, Banks, etc. who provide services to the farmers and other stakeholders such as skill enhancement training, funds, new technology etc.

1.6 KEY CHALLENGES IN THE UPSTREAM AND DOWNSTREAM OF AGRICULTURE VALUE CHAIN

A typical agricultural value chain is comprised of upstream actors (primarily the suppliers of input factors), primary producers and downstream actors. Sustainable and efficient crop production is a matter of cultivation systems, in which many upstream and downstream actors play an important role. Upstream activities are those close to the exploitation of natural resources. The output obtained is the primary commodity. Downstream activities add value to the products, through manufacturing or customization, resulting in the final commodity.

i. Upstream Challenges

- a. Lack of freedom for farmers to sell wherever and whomever.
- b. Farm produce should be sold only at regulated markets through registered intermediaries.
- c. Lack of efficient price discovery due to cartelization by traders.
- d. Imposition of multiple fees and cesses.
- e. Lower price realization for farmers.
- f. Scarcity of resources: Land, water and the health of the soil are all under severe stress in India.
- g. Scope to improve yield: Indian crop yields continue to be far below international averages.

To increase the income level of farmers, the entire value chain process needs to be improved.

ii. Down Stream Challenges

Some of the key challenges in the downstream of agriculture value chain are:

- a. **Multiple intermediaries and lack of transparency and traceability:** Mandis and FPOs need digitization to bring more transparency into transactions. Farmers need more sales channels. Data and market both can empower each stakeholder.

- b. **Losses in the food chain:** Around 60 per cent of food loss and waste in India happens between the field and the end-consumer (McKinsey Report, 2017), and this is concentrated in a few crops especially fruits, vegetables and cereals.
- c. **Trends in consumption moving towards fruits, vegetables and pulses:** Over time, the Indian diet has seen a significant shift towards higher protein intake. An increase in per capita income is changing customer preferences towards healthy foods, leading to increased consumption of proteins, especially pulses. Overall, the future demand will be driven by fruits, vegetables and pulses, while demand for wheat and rice will only grow in proportionately with the population. This leads to an upstream impact on the type of crops the farmers are focusing on producing.
- d. **Other Reasons:** Several reasons are there like high cost of stable power supply, low-capacity utilization and limited financing options. We have to address these challenges to render maximum benefits to the farmers.

1.7 DIGITAL OPPORTUNITIES ACROSS THE AGRICULTURAL VALUE CHAIN

Many digital technologies need to be scaled up in agribusiness, some of which have already been done. For instance, India has recently implemented one of the best soil health management systems available. The agriculture sector of India is currently utilizing numerous digital technologies during pre-production, production, and post-production.

Some of the key opportunities that can create value and boost farmers' income are mentioned below:

1. Digitalization and Analytics

Digitization and analytics will play a critical role in building India's farms of the future. Potential disruptions that could unlock the value chain are:

- (a) Precision farming including integrating field data, and weather patterns to drive agronomic advice to farmers and yield forecasting.
- (b) Efficient farm lending with electronic applications, disbursement of loans, insurance payouts linked to weather, field data, and Direct Benefits Transfer in agriculture.
- (c) Centralized platform integrating farmers and wholesale markets, to provide timely information for price realization.
- (d) Internet of Things (IoT) based advanced analytics in manufacturing plants to improve availability, throughput, and save costs.

2. Financing and Crop Insurance

It can help in strengthening the ecosystem.

- (a) Provide innovative equipment-financing models to farmers through

partnerships with manufacturers, weather forecast agencies, and digital partners.

- (b) Offer easy financing for FPOs for community infrastructure for storage and transportation.
- (c) Create digital ecosystems for financing and crop insurance.

3. Establishing Market Linkages Between Farmers and Buyers

This will establish transparency in pricing and better value, especially for perishable products. In addition, it will enable the downstream players to source more effectively by eliminating intermediaries.

4. Investing in Cold-Storage

Utilizing digital technologies, farmers are able to predict the dynamics of supply and demand for agricultural products. As a result, farmers are able to safely store their agricultural products and supply them in accordance with market demand.

5. Invest in Fruits, Vegetables and Pulses to Meet Demand

There is a huge scope for investing in fruits, vegetables and pulses to meet our demand. After fulfilling the domestic consumption demand, we can export also.

Activity 1.1:

Visit any agri farm around you and list down the challenges faced by that farmer in implementing the value chain.

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1.8 AGRI VALUE CHAIN MANAGEMENT

Agri value chain management is the most important measure of any agri farm to grab maximum benefits from it. It is the process of keeping track of and overseeing each element that comprises growing, producing, ensuring product quality and distributing agricultural products.

Through the process of Agri value chain management, farmers continuously manage and monitor their operations to maximise production, reduce waste,

and take corrective action to close any shortcomings in the way they operate today.

Agri value chain management allows an agri organization's capacity to track, manage and capture customers. It helps in more accurate cost estimates for planning, procurement, production, and service operations. Additionally, it ensures that products meet the proper quality standards and satisfy market requirements.

1.9 AGRICULTURAL VALUE CHAIN FINANCE

Agri value chain finance is a financial approach and set of financial instruments that can be applied to agricultural and agribusiness financing. It can facilitate increased financial access and lower agricultural costs and financing risks.

In simple words, agri-value chain finance is concerned with the flow of funds to and within a value chain to meet the needs of chain actors for finance, to secure sales, to buy inputs or produce, or to improve efficiency. Examining the potential for value chain finance involves a holistic approach to analysing the chain, those working in it, and their interlinkages. These linkages allow financing to flow through the chain.

Generally, the bank provides need-based agricultural loans of varying tenors to all credit-worthy clients engaged in farming of cash crops, horticulture, plantations, poultry, animal husbandry, dairying, seeds, warehousing, etc. Thereafter, the bank also finances the supplies of a wide range of agri inputs like seeds, fertilizers, pesticides, micronutrients and micro-irrigation tools. Further, banks have identified the transportation, storage and processing of food and other agri commodities as a thrust area and are offering working capital and term loans of varying tenors to eligible processors, based on not only their financials but also on the strengths of underlying commodities. In this manner, the bank facilitates the value chain from the "farm gate to the food plate".

1.10 LET US SUM UP

In this unit, you have learnt the following:

- The concepts of 'value chain' and 'agri value chain' are explained in this unit.
- Value chain concept was introduced by Michael Porter to describe the full range of activities, that are required to bring a product or service from conception, through the different phases of production, distribution to consumers and final disposal after use. As the product moves from one player in the chain to another, it is assumed to gain value.
- Agri Value Chains represent a complex network of inputs and outputs that link farm production inputs to food consumers. They involve a wide range of stakeholders.
- Setting the appropriate strategy for the value chain in agribusiness is very important. At present, the sustainability of the value chain is also a considerable issue. The extreme weather volatility, growing food demand and wide gap in the agriculture productivity in India and the neighbouring

regions are the reasons for getting importance by value chain in agri farms.

- A typical agricultural value chain is comprised of upstream actors (primarily the suppliers of input factors), primary producers and downstream actors. Sustainable and efficient crop production is a matter of cultivation systems, in which many upstream and downstream actors play an important role.
- During recent times, many digital technologies need to be scaled up and incorporated in the agriculture sector in India.
- Agri value chain management is the most important measure of any agri farm to grab maximum benefits from it. It is the process of keeping track of and overseeing each element that comprises growing, producing, ensuring product quality and distributing agricultural products.
- Agri value chain finance is a financial approach and set of financial instruments that can be applied to agricultural and agribusiness financing.

1.11 KEYWORDS

CAGR	: It is the acronym for the Compound Annual Growth Rate. It is the measure of an investment’s annual growth rate over time, with the effect of compounding taken into account.
Collection agents	: They own individual collection units or sheds. They procure agricultural produce directly from the producers. Sometimes, they are farmers themselves, and they market their produce through their shed along with the produce of other farmers.
Economic Rent	: The extra amount earned by a resource (e.g., land, capital, or labour) by virtue of its present use.
Economies of scale	: It refers to the cost advantage experienced by a firm when it increases its level of output.
Inbound logistics	: It includes functions like receiving, warehousing and managing seeds, fertilizers, pesticides etc.
IoT	: The term IoT, or Internet of Things, refers to the collective network of connected devices and the technology that facilitates communication between devices and the cloud, as well as between the devices themselves.
Processors	: They convert the raw product into value-added products such as pulp, jams, jellies, juice, pickles and other canned products.

- VUCA** : VUCA stands for volatility, uncertainty, complexity, and ambiguity. It describes the situation of unpredictable change.
- World Bank** : The World Bank is an international development organization owned by 187 countries.

1.12 SUGGESTED FURTHER READINGS/ REFERENCES

1. Cuddeford, V. (2014). Introduction to Agricultural Value Chains.
2. Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, and International Labour Organization, 2010. Gender and Rural Employment Policy Brief #4: Agricultural value chain development: Threat or opportunity for women's employment? http://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_150833.pdf
3. Jonathan Mitchell, Jodie Keane, and Christopher Coles, 2009. Trading up: How a value chain approach can benefit the rural poor. COPLA Global: Overseas Development Institute. <http://www.odi.org.uk/resources/docs/5656.pdf>
4. Mary McVay and Alexandra Snelgrove, 2007. Program Design for Value Chain Initiatives. Mennonite Economic Development Associates. http://www.meda.org/images/stories/ML/Program_Design_Toolkit.pdf
5. McKinsey report- Harvesting golden opportunities in Indian agriculture: From food security to farmers income security by 2025. Derived from <https://www.mckinsey.com/~media/McKinsey/Industries/Chemicals/Our%20Insights/Harvesting%20golden%20opportunities%20in%20Indian%20agriculture/Harvesting-golden-opportunities-in-Indian-agriculture.pdf>
6. Nadhika, K., & Krishnankutty, J. (2017). Stakeholder Analysis for Farmer Inclusive Value Chain Development in Mango.
7. Nadhika, K., & Krishnankutty, J. (2017). Stakeholder Analysis for Farmer inclusive Value chain Development in Mango. Journal of Extension Education, 29(1).
8. Trienekens, J. H. (2011). Agricultural value chains in developing countries a framework for analysis.

Web Links:

- <http://www.eei-ner.org/wp-content/uploads/2019/09/Reading-Material-NIAM.pdf>
- <https://en.unesco.org/creativity/sites/creativity/files/digitallibrary/Introduction%20to%20Value%20Chain.pdf>
- <https://gramworkx.medium.com/the-agricultural-value-chain-its-challenges-and-opportunities-in-india-6fb433bb0e7a>

- https://icrier.org/pdf/Book_flyer_Value_Chain.pdf
- <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/52685/IDL-52685.pdf>
- <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/52685/IDL-52685.pdf>
- <https://www.investopedia.com/terms/v/valuechain.asp>
- <https://www.jiva.ag/blog/what-are-the-most-common-problems-and-challenges-that-farmers-face>
- <https://www.nasscom.in/knowledge-center/publications/agritech-india-emerging-trends-2019>

1.13 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1.1

1. All of the above
2. Primary activities consist of the following five components:
 - i) **Inbound logistics:** It includes functions like receiving, warehousing, and managing seeds, fertilizers, pesticides etc.
 - ii) **Operation:** It includes procedures for converting raw materials into a finished product such as pulp, jams, jellies, juice, pickles, etc.
 - iii) **Outbound logistics:** It includes activities to distribute a final product to a consumer.
 - iv) **Marketing and sales:** Marketing and sales include strategies to enhance visibility and target appropriate customers - such as advertising, promotion, and pricing.
 - v) **Service:** It includes programs to maintain products and enhance the consumer experience - like customer service, maintenance, repair, refund, and exchange.
3. Support activities consist of the following four components:
 - i) **Procurement:** It concerns how a company obtains raw materials.
 - ii) **Technological development:** It is used at a firm's research and development (R&D) stage-like designing and developing manufacturing techniques and automating processes.
 - iii) **Human resources (HR) management:** It involves hiring and retaining employees who will fulfil the firm's business strategy and help design, market, and sell the product.
 - iv) **Infrastructure:** It includes company systems and the composition of its management team -such as planning, accounting, finance, and quality control.