2

Review of Literature

Review of literature facilitate comprehensive knowledge on the concepts used in earlier studies and helpful to adopt, modify and formulate an improved conceptual framework in the present study and to draw meaningful conclusions. The Review of Literature pertaining to the study entitled on **"Agricultural Marketing Behaviour and Practices of Rural Farmers in Dibrugarh District, Assam"** is reviewed under the following headings:

2.1 FUNDAMENTALS OF AGRICULTURAL MARKETING

- 2.1.1 Meaning and Definition of Marketing and Agricultural Marketing
- 2.1.2 History and Growth of Agricultural Marketing in India
- 2.1.3 Need and Scope of Agricultural Marketing
- 2.1.4 Functions of Agricultural Marketing
- 2.1.5 Classification of Markets
- 2.1.6 Source of Marketing Information on Agricultural Produce
- 2.1.7 Vegetables Production and Marketing in India, the North East and Assam

2.2 SCENARIO OF FARMERS IN THE FIELD OF AGRICULTURAL MARKETING

- 2.2.1 Definition of Farmers, Rural Farmers, Farming and Rural Marketing
- 2.2.2 Land Holding Patterns of Farmers
- 2.2.3 Marketing Behaviour of Farmers in Vegetables marketing.
- 2.2.4 Marketing Practices of Farmers in Vegetables marketing.
- 2.2.5 Post – Harvest Management Practices of Vegetables
- 2.2.6 Barriers Faced by Rural Farmers in Marketing Vegetable produce

2.3 AGRICULTURAL MARKETING SYSTEM AND SCHEMES

- 2.3.1 Agricultural Marketing- Institutions, Agencies and Channels
- 2.3.2 Schemes for Agricultural Platforms

2.4 DIGITAL AGRICULTURAL MARKETING – APPS AND PORTALS FOR MARKETING

- 2.4.1 Basic concept on Digital Agricultural Marketing
- 2.4.2 Apps and Portals for Agricultural Platforms

2.5 RELATED RESEARCH STUDIES

2.1 FUNDAMENTALS OF AGRICULTURAL MARKETING AND VEGETABLES MARKETING.

2.1.1 Meaning and Definition of Marketing and Agricultural Marketing

Sengar et al. (2021) defined in simpler term, 'Marketing is the process of developing, promoting and distributing products to satisfy consumer needs and wants.

Krishnamacharyulu and Ramakrishnan (2011) stated that according to the National Commission on Agriculture, 'Agricultural Marketing is a process that starts with a decision to produce saleable farm products that also includes pre and post-harvest operations, assembling, grading, storage, transportation and distribution'. These are the main functions of agricultural marketing. It is observed from many theoretical and empirical studies that transfer of agricultural produce from the hands of farmers to the hands of consumers takes place through a chain of middlemen or agencies.

Sharma et. al. (2021) explained the term agricultural marketing which composed of two words- agriculture and marketing. Agriculture, in the broadest sense, means activities aimed at the use of natural resources for human welfare, i.e., it includes all the primary activities of production. But generally, it is used to mean growing and/or raising crops and livestock.

Krishnamoorthy (2011) expressed that the study of agricultural marketing, comprises all the operations and the agencies conducting them, involved in the movement of farm-produced foods, raw materials and their derivatives, such as textiles, from the farms to the final consumers and the effects of such operations on farmers, middlemen and consumers. This definition does not include the input side of agriculture.

Kumar et al. (2014) Agricultural marketing is a process, where the product moves from the farm to the final consumer. Meanwhile there are many activities that are happening from planning what to produce to harvesting, drying, grading, packing, transporting, storage, agro-and food processing, distribution advertising and sale.

Vadivelu and Kiran (2013) defined Agricultural marketing as the commercial functions involved in transferring agricultural products consisting of farm, horticultural and other allied products from producer to consumer.

Aarthi and Rethinavelu (2017) opined that Farmers Direct Marketing is the real rural marketing. A Step towards to enhance the agricultural marketing and economic growth. In

India direct marketing practices of farm produce were some types they are farmer's association markets, government markets, Local markets (Santhai) and Road side markets. This direct marketing strategy gives fair remunerate returns to the farmers compare to other channel of distribution. But the responsibility, risks were also high in addition. For instance, the agricultural produce was highly perishable therefore, the special transportation, special storage facility is essential.

Rajendran and Karthikesan (2014) stated that direct marketing of agricultural produce is the need of the hour. Efforts should be made to provide facilities for lifting the entire stock that farmers are willing to sell at an incentivized price. There should be provisions for storing the stock, such as godowns and warehouses, to help farmers hold their produce until prices stabilize. Usually, immediately after harvest, prices are low; however, if farmers patiently hold their produce for some time, they may fetch better prices. Brokers manipulate agricultural stock trading, but farmers often fail to recognize or realize this due to a lack of proper market price information.

Kadrolkar (2014) highlighted that agricultural markets in most parts of the country are established and regulated under the State APMC Acts. The whole geographical area in the State is divided and declared as a market area wherein the markets are managed by the Market Committees constituted by the State Governments. Once a particular area is declared a market area and falls under the jurisdiction of a Market Committee, no person or agency is allowed freely to carry on wholesale marketing activities. Most of APMC have market yard where traders and other marketing agents are provided godowns and shops for purchase of agriculture produce from formers. The APMC generates many benefits for the farming community, including fair prices for farmers, accurate weighing of agricultural produce, maintenance of a daily price list of commodities for the benefit of farmers and immediate payment after the disposal of produce (within 24 hours).

2.1.2 History and Growth of Agricultural Marketing in India

Jain (2001) stated that in India, the importance of an efficient marketing system as a vital link between the farmer and the consumer was recognised way back in 1928 by the Royal Commission on Agriculture (Acharya, 1996). Since then, a good deal of progress has been made in organising agricultural marketing by adoption of various administrative and legislative measures from time to time. The establishment of the Directorate of Marketing

and Inspection in 1935, the enactment of the Act for grading and marking of agricultural produce in 1937, the conduct of commodity market surveys and the establishment of regulated markets in the States under the Agricultural Produce Marketing Regulations Acts are some of the measures which were taken up before independence to improve the marketing situation.

Ghosh (2013) informed that after independence, most states passed legislations to build the infrastructure of markets for trading agro-products. The early years of independence (mostly in the 1960s decade) saw frequent reorganization of states that resulted in a multiplicity of mutually inconsistent market-regulating rules drawn from legislations that had been enacted in the different parent states prior to independence. The Agricultural Produce Marketing (APMC) Act aimed to regulate wholesale and primary markets to protect farmers from exploitation and reduce price spread between the producer and consumer. The Five-Year Plans emphasized developing physical markets, storage and facilities for standardization, grading, packaging and transportation. Initially, the focus was on cereals, but later expanded to include horticulture, oilseeds, pulses and livestock products.

Sulaiman (2017) expressed that the first agricultural census was started in 1970-71 (July-June) as part of the 1970 World Agricultural Census Programme. It collects agricultural information such as number, area, tenancy, land utilization, cropping\ pattern and irrigation particulars of different sizes. The Indian Parliament Act, 61 of 1981 approved to set National Bank for Agriculture and Rural Development (NABARD). National Bank for Agriculture and Rural Development is the apex body looking for the financial requirements of agriculture and rural development. This bank is working since November 1982 for the well-being of farmers.

Kumar et al. (2004) elicited that the growing population and their improving economic status are causing a rapid growth in demand for vegetables in India. The annual per capita consumption of vegetables increased from 47 kg in 1983 to 76 kg in 1999 and in this, a considerable increase was due to the consumption of leafy vegetables. The consumption of bulbs and tubers too witnessed a significant growth. On the other hand, the consumption of cereals remained stable during this period. The growth in per capita vegetable consumption was higher than that of milk, meat and fish. The increase in consumption of vegetables during the period 1987-88 to 1999-00 was higher in the rural than urban areas,

because of relatively higher consumption of livestock and fish products and fruits in the urban areas, the overall increase in vegetable consumption was about 53 per cent.

Joshi et al. (2006) highlighted that the production of vegetables reached 88.62 million tonnes in 2001-02 from 58.63 million tonnes in 1991-92. And, the smallholders have contributed significantly to this rising production. In 2001, they contributed 55 per cent to the total production of fruits and vegetables, up from 51 per cent in 1991 and 43 per cent in 1970- 71. The share of smallholders in production of fruits and vegetables is likely to go up further. Numerous studies indicate that farmers are gradually shifting towards high-value commodities, particularly fruits and vegetables. Also, they reported fruits and vegetables offer immense scope to increase income levels of smallholders and improve the productivity of scarce resources.

2.1.3 Need and Scope of Agricultural Marketing

Dasan (2002) narrated that agriculture is one of the oldest of our inventions; without which the constant search for food would have precluded other development.' Agriculture plays a predominant role in the progress of the country and it is the backbone of Indian economy. In developing economies, marketing is still in its infancy. An effective marketing system alone can bring the fruits of production to the people. Economic growth in the less developed nations of the world depends greatly on their ability to design effective marketing system to produce global customers for their raw materials and industrial output. Marketing of agricultural produce is as important as production itself.

Acharya and Agarwal (2011) stated that agricultural marketing system is necessary for an understanding of the complexities involved and the identification of bottlenecks with a view to providing efficient services in the transfer of farm products and inputs from producers to consumers. An efficient marketing system minimizes costs and benefits all the sections of the society. Different groups have varied expectations: producers seek quick sales and a fair share of consumer spending, consumers want quality products at low prices, middlemen and traders aim for steady income. The government has to act as a watch-dog to safeguard the interests of all the group associated in marketing.

Rajendran and Karthikesan (2014) discussed that the agriculture sector needs well-functioning markets to drive growth, employment and economic prosperity in rural areas of India. In order to provide dynamism and efficiency into the marketing system, large

investments are required for the development of post-harvest and cold-chain infrastructure nearer to the farmers field. Also, enabling policies need to be put in place to encourage the procurement of agricultural commodities directly from farmer‘s fields and to establish effective linkage between the farm production and the retail chain and food processing industries.

Acharya and Agarwal (2011) described that the scope of agricultural marketing must include both product marketing and input marketing. The subject of output marketing is as old as civilization itself. The importance of output marketing has become more conspicuous with the increased marketable surplus of the crops and other agricultural commodities. Input marketing is a comparatively new subject and farmers in the past used such farm sector inputs as local seeds and farmyard manure. These inputs were available with them; the purchase of inputs for production of crops from the market. The importance of farm inputs-improved seeds, fertilizers, insecticides and pesticides, farm machinery, implements and credit—in the production of farm products has increased in recent decades.

2.1.4 Functions of Agricultural Marketing

Reddy (2020) said that any single activity performed in carrying a product from the point of its production to the ultimate consumer may be termed as a marketing function. A marketing function may have anyone or combination of three dimensions, viz., time, space and form.

TNAU Agritech Portal - Agricultural Marketing and Agri-Business (2024) depicted the three marketing functions involved, i.e., assembling, preparation for consumption and distribution. Selling on any agricultural produce depends on some couple of factors like the demand of the product at that time, availability of storage etc. The functions i.e. Assembling (Concentration) pertains to the operations concerned with the assembly and transport of produce from the field to a common assembling area or the market. Preparation for consumption (processing) of the produce may be sold, as obtained from the field, or may be cleaned, graded, processed and packed either by the farmer or village merchant before it is taken to the market. Some of the processing is necessary for the conservation of quality and Distribution (Dispersion), which involves the operations of whole selling and retailing as various points. By a series of indispensable adjustments and

equalizing functions, it is the task of distribution system to match the available supplies with the existing demand.

Maratha and Badodiya (2017) indicated that today's agricultural marketing has to undergo a series of exchanges or transfers from one person to another before it reaches the consumer. Sometime processing is done because consumers want it, or sometimes to conserve the quality of that product. The task of distribution system is to match the supply with the existing demand by whole selling and retailing in various points of different markets like primary, secondary or terminal markets. Products are sold in various ways. For example, it might be sold at a weekly village market in the farmer's village or in a neighbouring village. If these options are unavailable, it might be sold at occasional markets in nearby towns or in the mandi.

Jain (2001) informed that after independence, three major sets of inter-dependent policies and programmes were pursued for the development of agricultural marketing in India. These were: the creation of infrastructure (both physical and institutional), the implementation of price stabilization policy and the approach to foreign trade in agricultural products that facilitates the performance of various marketing functions.

Vat (2024) explained the characteristics of Agricultural Market that the surplus available for marketing is much lower than international average due to small land holdings and bigger family size. The surplus is sold in three ways, (a) direct sale to consumers-mostly vegetables are sold by this method (b) selling to whole sellers or bulk consumers visiting villages for collection of produce – milk collection or sugarcane collection from villages (c) sale in the nearest mandi or market yard. The most important thing is relationship between good harvest and remunerative price. Every bumper harvest results in fall of market price due to lack of storage, transport and processing facilities. The presence of large number of intermediaries is another unique feature. The intervention of government in determination of prices is frequent.

2.1.5 Classification of markets

The classification of markets involves categorizing them based on various factors such as location, time span, area coverage, nature of transaction and volume of transaction.

TABLE I

CLASSIFICATION OF MARKET

Type of Market	Description
Location or Place of Operation	
Primary or Local Markets	These are periodical business sectors privately known as 'Haats'. They are commonly held more than once per week. They are commonly held in the open and alongside of the road in significant or midway arranged territories **(Karthick et al., 2020)**
Secondary Markets	Secondary markets are often referred to as wholesale or assembly markets and are referred to as "mandis" or "gungs." This markets are permanent; operations are routinely conducted in the markets during the year. The production is done in vast amounts and the performance of various utilities requires skilled operators. The markets are well served by roads and railway networks and have logistics, management and financial services **(Tripathi, 2018)**
Terminal Markets	A terminal market is where produce is ultimately sold to consumers, processors, or gathered for export. These markets are typically located in major metropolitan cities such as Delhi, Bombay, Madras and Calcutta. Merchants in these markets are well-organized and utilize modern marketing techniques to reduce stress and improve their business operations (**Gopinath & Ganesan, 2014).**
Time Span	
Short-period Markets	Markets held for a short time (a day or few hours), dealing in perishable goods like fish and fresh vegetables; prices depend on demand rather than supply **(Acharya & Agarwal, 2021)**
Long-period Markets	Markets held for an extended period, dealing with less perishable commodities such as grains; prices are influenced by both supply and demand factors **(Agribusiness Education and Research International, 2022)**
Periodic Markets	Held weekly, biweekly, fortnightly, or monthly in villages, semi-urban, or urban areas, primarily trading farm produce **(Acharya & Agarwal, 2021)**
Secular Markets	Markets that are always open, dealing in durable goods like machinery and manufactured products **(Agribusiness Education and Research International, 2022)**

Type of Market	Description
Area Coverage	
Local or Village Markets	A market where purchasing and selling activities are restricted to buyers and sellers from the same village or surrounding communities. Village markets are mostly for perishable goods in small quantities, such as local milk or vegetables **(Jainil, 2023)**
District-level Markets	Buyers and sellers are drawn from a larger geographical area within a district. **(Krishnamoorthy, 2011)**
State/National Level Markets	A market where buyers and sellers are based on a nationwide scale. Durable commodities such as jute and tea have national markets **(Jainil, 2023).**
World Markets	Global markets where participants from around the world trade commodities like gold, coffee, tea and cotton **(Krishnamoorthy, 2011)**
Nature of Transactions	
Spot or Cash Markets	The spot or cash market is a market where goods are traded for money immediately after the transaction **(Agribusiness Education and Research International, 2022)**
Forward Markets	A market in which the purchase and sale of a commodity occur at a time "t,' but the exchange of the commodity occurs at a future date, i.e., time t + 1. It is possible that the commodity will not be exchanged even on the given date in the future(t+1) **(Jainil, 2023).**
Volume of transaction	
Wholesale market	In the wholesale market, transactions between traders typically involve bulk exchanges where goods are bought and sold in large quantities, ensuring efficient distribution of products at competitive prices **(Chandana et al., 2020)**
Retail market	A retail market is one in which commodities are bought by and sold to the consumers as per their requirements. Transactions in these markets take place between retailers and consumers. The retailers purchase in wholesale market and sell in small lots to the consumers. These markets are very near to the consumers **(e-Krishi Shiksha, 2013)**

2.1.6 Source of Marketing Information on Agricultural Produce

Joshi (2022) affirmed that agricultural information is one of the very crucial inputs for rural development. The agriculture sector is progressively becoming knowledge intensive and the researchers are continuously coming up with new pool of information to enhance agricultural production and productivity. There is an extensive accumulation of knowledge and information at regional, national and international level.

Lwoga et al., (2011) informed that to utilize information and knowledge to improve productivity especially in agriculture, advancements in the information and communication technologies provide an opportunity for developing and agrarian countries like India.

Ballyntyne (2009) stated that the developing world requires reliable information and knowledge regarding agricultural issues. It is essential for this knowledge to be both accessible and effectively communicated. Simply having more information is insufficient; there is also a need for access to diverse knowledge from various sources, including producers, scientists, educators, advisors and policymakers. Individuals and institutions in agriculture are looking for greater opportunities to interact, discuss and engage with different viewpoints and perspectives, bridging the gap between peripheral and central perspectives.

Pongener and Jha (2024) depicted that Information plays a very important role in adopting the agricultural practices and decision making by farmers. Optimal decision-making among the poor is often hampered by insufficient knowledge, false beliefs, or wrong perceptions. Agricultural information services have potential contribution to agricultural production by helping farmers to adopt new technologies or farming systems. Agricultural information plays a crucial role in making farmers aware to acquire bank loans and other farming inputs, as well as measures to control pests and diseases.

Duhan and Singh (2017) explained that access to pertinent information and facts is necessary to improve the agricultural performances and livelihoods in the rural areas especially in developing countries. To improve income and reduce poverty agriculture extension is considered as an important tool for disseminating agriculture information to farmers and has been pointed out as significant intermediary needed to transform traditional farming into a modern and commercial agriculture. To interact with the other factors of production, agricultural information is an essential factor. To control over their resources and decision-making processes information empowers farmers.

Rajendran and Karthikesan (2014) dictated that information is one of the key to increase marketing success for everyone. A market information system is an important tool used by modern management to aid in problem solving and decision making. Market Information

System is a process of gathering, processing, storing and using information to make better marketing decisions and to improve marketing exchange.

Mukherjee and Jha (2024) depicted that Agricultural Extension has been at the forefront in disseminating relevant information to the stakeholders, not only to increase productivity, but also to improve their standard of living. Keeping in view the demand for agricultural growth, evolutionary changes were made from time-to-time in the mechanism of transfer of technology. In the present information era and changed extension paradigm, the Information and Communication Technology (ICT) is one such paradigm, providing timely, cost- effective and relevant information to the rural masses in general and farming community in particular, ensuing in changed agricultural scenario.

Monikha et al., (2021) stated about the Information and communication technologies (ICTs) are becoming important aspect of agriculture sector. Mobile phones and computers provide timely, cost effective and relevant information leading to changing agricultural scenario. Delivery of appropriate information can play an important role including technology delivery, improved access to advice, research, markets, credit, infrastructure, farmer organization development and business development services

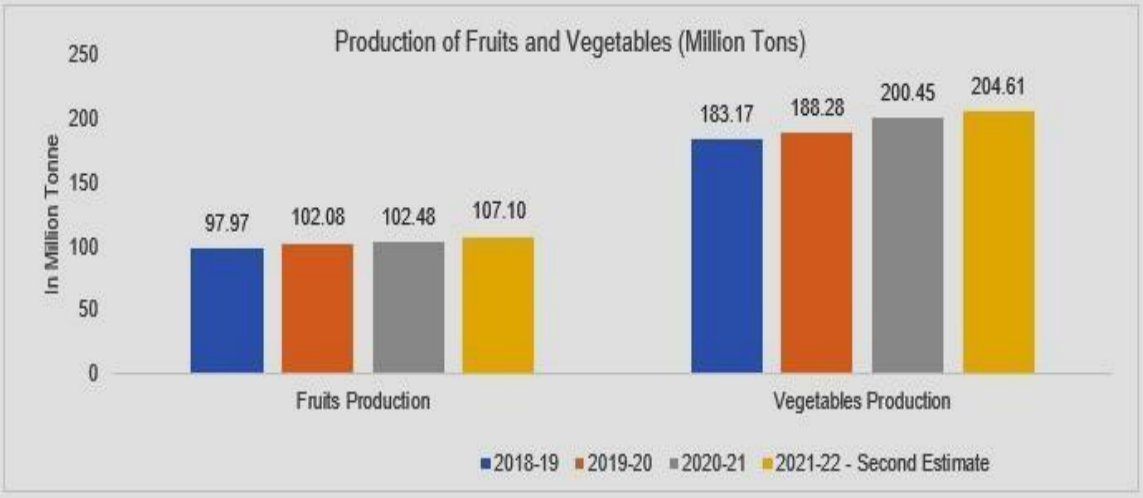
Yusuf et al., (2020) explained that the lack of access to basic agricultural knowledge and information by rural farmers may have been responsible for their attachment to and preference for old traditional methods of farming system. Thus, adequate access to knowledge and information in areas of new agricultural technologies, early warning systems (drought, pests, diseases etc.), improved seedlings, fertilizer, credit, market prices, among others have been recognized as low-cost inputs for improved rural agricultural development.

2.1.8 Vegetables Production and Marketing in India, Northeast and Assam

Lahkar (2020) explained vegetable market is a type of building or structure created and designed in various colours, materials, shapes, sizes and styles with accurate and specific fruit and vegetables. Vegetable markets provide healthier food items that are fresher than the ones available in supermarkets. The vendors directly come and sell in almost every neighbourhood. So it is convenient for almost everybody everywhere. The marketing of horticultural crops is complex and risky due to their unique conditions of high

perishability, seasonability and bulkiness. Horticultural crops require special care and attention in providing time, form and space utilities which in turn adds to the marketing costs.

India Brand Equity Foundation (2020) reported that India is the second largest producer of the fruits and vegetables in the world after China. The country has diverse topography and climate, which ensures availability of fruits and vegetables in every season. During 2021-22, India produced 204.61 million metric tonnes of vegetables and 107.10 million metric tonnes of fruits. The area under cultivation of fruits stood at 7.09 million hectares in 2021-22, while vegetables were cultivated at 11.28 million hectares.



Source: IBEF- India Brand Equity Foundation (2020)

FIGURE: I PRODUCTION OF FRUITS AND VEGETABLES IN 2021-22, INDIA

Malhotra and Srivastava (2023) informed that India has a vast diversity of horticultural crops with 109 fruits, 54 vegetables and 27 spice species of economic importance. The indigenous germplasm includes more than 5,000 accessions of fruits, 35,000 vegetables, 500 ornamentals, 6,000 spices and 8,500 medicinal crops. Assam is the largest producer of fruits, vegetables and spices in the region contributing almost 50% of the total area. The per cent of horticultural crops in Gross cropped area (GCA) was lower (16.47%) in Assam but is higher in hilly states with a maximum in (83.65%) Mizoram and (62.25) Sikkim. The production was highest (6826.87 thousand M tonnes) in Assam which contributes more than 50% of total horticultural production in the region. Tripura and Meghalaya are second and third largest producers.

Dubey et al., (2023) briefed that maximum number of farming family of Ne region are in small or marginal farming condition which involves less involvement of inputs in their cultivation practices resulting in low productivity and less outcome per unit of area. Low productivity (7-8 t/ha) of vegetable crop production is the major constraint usually found in farming community. This was due` to mono-cropping or less cropping intensity (Rice–Pea, Rice–Okra, Rice– Tomato and Rice–Brinjal) with less diversity of crops and improved varieties and along with little integration with others farming systems, viz. fishery, goatery, poultry and cattle-based farming system.

Department of Agriculture, Government of Meghalaya (2023) declared that in most of the rural markets, facilities are either not available at all or not adequate. The primary markets in Assam, Meghalaya and Tripura do not even have basic infra structural facilities and are in fact mere meeting place for buyers and sellers. The important component of infrastructure necessary for growth of agricultural marketing are communication/ transport and storage facilities are utterly deficient. The average distance covered varies from 5-10 KM. Road transport is the primary mode of transport from the producer‘s yard to the primary, secondary and terminal markets. Storage facilities in the rural areas and in the primary markets are either absent or insufficient. In Mizoram and Arunachal Pradesh, such facilities do not practically exist. In Assam, Manipur and Tripura, the storage facilities available are predominantly ―katcha. Only in Meghalaya ―pucca‖ storage facilities are available in large number of primary markets.

Yadav (2012) informed that Agricultural and horticultural production of the Assam State is serviced through more than 1100 rural weekly markets and a network of 75 primary wholesale Markets & 30 secondary wholesale markets. Besides these there are other markets which are under Town Committee and District council. The Assam Agricultural Marketing Board (AAMB) has established 24 Regulated Market Committees, 20 Primary Market Yards, 206 Sub-market Yards, 735 Rural Primary Markets and 405 Wholesale Markets**.** The Assam Agricultural Produce Market Act, 1972 is an act to provide for better regulation of buying and selling of agricultural produce and for the establishment of markets for agricultural produce in the State of Assam.

TABLE II

DISTRIBUTION OF WHOLESALE ASSEMBLING PRIMARY AND REGULATED MARKETS IN NER

Sl. No	State	No. of Wholesale Markets	No. of Rural Periodic Markets	Total	No. of Principal Regulated Markets	No. of Sub-yard	Total
1	Assam	172	650	822	16	19	35
2	Arunachal Pradesh	-	50	50	-	-	-
3	Manipur	20	49	69	APMC Act Not passed		
4	Meghalaya	101	82	183	2	-	2
5	Mizoram	8	35	43	-	-	-
6	Nagaland	16	80	96	-	-	-
7	Tripura	84	554	638	21	-	21
Total		401	1500	1901	39	19	58

Source: Directorate of Marketing and Inspection, Ministry of Agriculture, Govt. of India, 2022

Choudhury et al., (2013) expressed that Assam is a state where huge vegetables are produced in different vegetable growing pockets. These vegetables are transported to the various region of Assam including North Eastern States for millions of people. So, a huge population is depends on the vegetables grown in various vegetable growing pockets of Assam which needs monitoring of pesticides residue.

Yadav et al., (2003) stated that in case of vegetables, Assam has maximum area under potato (75.3 thousand ha), cabbage (18.5 thousand ha), brinjal (12.5 thousand ha), sweet potato (9.4 thousand ha), onion (7.8 thousand ha) and cauliflower (12.5 thousand ha). Meghalaya has second largest acreage of potato (20.8 thousand ha) after Assam.

2.1 SCENARIO OF FARMERS IN THE FIELD OF AGRICULTURAL MARKETING

2.2.1 Definition of Farmers, Rural Farmers, Farming and Rural Marketing

Dyer (2007) defined that a farmer is a person engaged in agriculture, raising living organisms for food or raw materials. The term usually applies to people who do some combination of raising field crops, orchards, vineyards, poultry, or other livestock. A

farmer might own the farmed land or might work as a labourer on land owned by others, but in most developed economies, a farmer is usually a farm owner, while employees of the farm are known as farm workers, or farmhands. However, in other older definitions a farmer is a person who promotes or improves the growth of plants, land or crops or raises animals (as livestock or fish) by labour and attention. Farming is a employment occupational type and their activity sector involved agriculture and field of employment is farm and agribusiness.

Conable (2015) defined rural farmers are those who are involve in farming and carrying out other related farming activities in the villages. They may cultivate food crops, mono crop, rear livestock's, engage in finishing and hunting among others, but they depend on seasonal and natural conditions to carry on their farming activities.

National Academies of Sciences, Engineering and Medicine (2019) mentioned about the Merriam-Webster Dictionary who defines farming as ―the practice of agriculture or aquaculture, and the Oxford English Dictionary (second edition, 1989) defines farming as ―the activity or business of growing crops and raising livestock.

Prasad (2018) said that according to Thomsen, Rural marketing comprises of all the operations and the agencies conducting them, involved in the movement of farm produced food, raw materials and their derivatives, such as textiles, from the farms to the final consumers and the effects of such operations on producers, middlemen and consumers.

Pandey and Rajpurohit (2016) stated that according to G.N. Murthy Rural marketing is the study of all the activity, agency and policy involved in the procurement of farm inputs by the farmers and the movement of rural products from farmers to consumers‖ .

National Sample Survey Office (**2021)** stated that Indian farmers are people who grow crops as a profession and various government estimates give a different number of farmers in the country ranging from 37 million to 118 million.

2.2.2 Land Holding Patterns of Farmers

Press Information Bureau (2019) stated about the land holdings of farmers which are categorized in five size classes. First category of farmers are those who have less than 1 hectare of land are called marginal farmers, Second category of farmers who have 1 or 2 hectares of land are called small farmers, Third category of farmers who have 2 to 4

hectares of land are called semi-medium farmers, Fourth category of farmers who have 4 to 10 hectares of land are called medium farmers and A fifth category of farmers who have 10 hectare and above land are called large farmers.

Roy et al., (2020) mentioned that land is a vital resource in agricultural production and hence, land-related assets must be used with due conservation, preservation and moderation. Small farmers dominate Indian agriculture having fragmented agricultural landholdings. The average size of landholding declined from 2.30 ha in (1970-71) to 1.32 ha in (1970-71) and the absolute number of operational holdings increased from about 70 million to 121 million. If same trend continues, the average size of holding in India is 0.68 ha in 2020 and would further reduce 32 ha in 2030.

Birthal and Joshi (2006) described that in India, a farmer is categorized as a smallholder if he owns land equal to or less than 2.0 hectares in size. However, size of land may not be the only criterion for categorizing farmers as smallholders. Narayanan and Gulati (2003) consider smallholder as a farmer (crop or livestock) practicing a mix of commercial and subsistence agriculture or where the family provides most of the labour and the farm provides the principal source of income. Smallholder farmer who owns or rents in land equal to or less than 2.0 hectares, is largely dependent on family labour and chooses a production portfolio that meets his household food-security requirements and generates cash flow from commercial crops.

Sachan et al., (2019) stated about the infrastructure that should be in such a way where the entire stock should be sold by willing farmers. There should be provision of godowns in villages so that the produce can be stored and sold when the price increases after the harvesting period is over. The brokers play the games during trading which farmers do not know because of improper information of market price. The farmers should be trained in such a way that they cannot be exploited by the traders. The marketing committees needed to be set up representing growers, merchants, local bodies and traders whose main objective is ensuring proper prices for farmers.

2.2.3 Marketing Behaviour of Farmers in Vegetables marketing.

Gayathri et al., (2021) defined that Marketing behaviour refers to the ability or inclination of each farmer to identify the market's tendency to sell the product for more profit. It is necessary for the farmers always to be aware of their marketing behaviour since the

vegetables are easily damaged in an environment that needs immediate marketing. They also stated that for measuring the marketing behaviour, the statements used to analyze marketing behaviour of farmers are stated as: Reasons for selling at a particular period/time, whom do you sell the produce, Reasons to sell to a particular agency, where do you sell the produce and Reasons for selling at a particular place. The scores were assigned to the respondent on the basis of numbers of reasons for a particular statement. On the basis of these responses, respondents were classified into low, medium and high categories

Rai and Dubey (2018) defined about Marketing behaviour which envisages all the activities involved in the flow of goods and services from production point till it reaches the ultimate consumer. The marketing activities involve the function of buying, selling, preparation of produce for marketing, assembling, transportation, grading, packaging, storage, processing, retailing, marketing, credit, distribution, quality assurance, market news and intelligence, extension and training, development of market network.

Maratha (2017) expressed about the marketing behaviour as the behaviour of the farmers with respect to marketing aspects of vegetables including time of sale, place of sale, marketing channels used and market prices. It is used to analyze marketing behaviour of farmers are as follows. Reasons for selling at a particular period/time, whom, do you sell the produce, reasons to sell to a particular agency, where do you sell the produce, reasons for selling at a particular place

Pasha (2020) opined that increase in vegetable production can provide more farm employment. Marketing behaviour of a farmer is influenced by several factors such as cost of picking information received from village extension officer, total cultivation cost and maintenance cost which were considered to be the best predictors of performance of cultivating function. The problems in Marketing are scrutinized such as cost of picking, maintenance cost, cultivation cost and poor information provided by village extension officers reducing the performance of this functional area. Personal and business factors also influencing and affecting the overall performance of the farmers which were identified as some general problems like non-availability of fertilizers, shortage of storage facilities, shortage of transport facilities, insufficient rain, inadequate pesticide and fluctuation in price due to seasonal glut reducing the performance.

Melkeri et al., (2020) depicted that post-harvest and marketing behaviour is a chain of interconnected activities from the time of harvest to the delivery of the food to the consumers. Agricultural commodities produced on the farm have to undergo several procedures like harvesting, drying, threshing, winnowing, processing, bagging, storage, transportation and exchange before reaching the final consumer. The primary role of an effective post-harvest system is to ensure that the harvested food reaches the consumer, while fulfilling customer satisfaction in terms of quality, volume and safety. A post-harvest loss of fruits and vegetable is 22 to 40 per cent, pulses, oilseeds and cereals is 10 to 30 per cent. These losses mainly arise because of improper harvesting methods, problems of threshing, storing, transportation and processing leads to large-scale losses in food grains.

2.2.4 Marketing Practices of Farmers in vegetables Marketing

Skalen et al., (2022) defined Marketing practice which refers to the activities and processes carried out by marketers to create value within organizations and between organizations and their stakeholders. It involves the implementation of marketing strategies, the analysis of customers and markets, the management of marketing mix elements and the establishment of relationships with stakeholders. Prevailing practices on agricultural marketing in India include "traditional methods such as selling through Agricultural Produce Market Committees (APMCs) as well as modern approaches like direct marketing, contract farming and the use of digital platforms for trading. The agricultural marketing practices includes:

Time of sale: Vegetables are very perishable by nature, farmers sell the vegetables immediately after harvest, in order reduce the damage and to gain immediate monetary benefit. Vegetables like potato and onion, can sold after initial storage, expecting good price in future (**Srinivas et al., 2016)**

Mode of transport: The selection of mode of transport depends on quantity of the produce and distance of market, some farmers have their own vehicles for transportation and some of the respondents hire tempo or other vehicles for transportation. If quantity is large and to sell their produce in faraway markets, they used lorry as a mode of transport if there is availability. Small land holding farmers near to market they use moped for transportation of vegetables **(Balappa, 2000).**

Mode of packing: Packing of vegetables is one of the more important step in the long and complicated journey from grower to market. Vegetables like tomato and brinjal, they use plastic crates for packing in order to avoid damage during handling of vegetables. For beans, cabbage, chilli and onion they used net/mesh type bags, as these provide good aeration and keep vegetables fresh (**Srinivas et al., 2016)**.

Place of sale: Farmers prefer nearby markets for sale, due to competitive prices and credit facility. If large quantity of marketable surplus they prefer to sell in for away markets, usually farmers are not interested in selling produce in village. Because they perceive that they realize less price for their produce (**Srinivas et al., 2016)**.

Middlemen Involvement: Absence of institutional markets and prevailing dominance of private markets would have allowed the middlemen to flourish in marketing the produce of the farmers **(Janani et al., 2016).**

Sorting/Grading: Fruits and vegetables are typically graded according to their weight, size, colour, form, specific gravity and lack of illness. Hand grading and machine grading are two ways of evaluating fruits and vegetables for fresh marketing. Produce is rated according to size in both approaches. On the other hand, electronic grading systems are gaining popularity in the horticultural industry and have been effectively applied in small-scale research. Even though the grading process is totally automated, India still uses manual grading **(Arora, 2022).**

Distance of the Market: Basically wholesale market is located in distance from rural areas. therefore. It is too far and expensive for small and marginal farmers to take the risk of marketing the produce at wholesale market **(Janani et al., 2016).**

Payment pattern: Farmers receive money in advance from commission agents or traders, for purchasing inputs and for making payment to labours. Mutual understanding between farmers and commission agents, payment to the farmers may be delayed. The wholesaler, commission agents and village merchant who procure the entire produce from the farmers pay them the entire amount during procurement. The farmer who sells their produce to the contractor is paid partially because the farmer had got money from the contractor in advance **(Devika et al., 2012).**

2.2.5 Post – Harvest Management Practices of Vegetables

Magray et al., (2017) indicated that Post-harvest management practices and post-harvest losses can be reduced by adopting breeding technologies for longer shelf life, improvement of pre-harvest factors and harvesting techniques, proper methods of handling, marketing, packaging, transportation and storage, development of appropriate processing technology. The post-harvest management practices includes:

Selection of varieties: Varieties with better keeping and processing quality and lesser handling susceptibility should be bred and selected for different vegetables (**Magray et al., 2017).**

Harvesting: Harvesting is an important unit operation, that decide upon the quality as well as storage life of produce and helps in preventing huge losses of fruits and vegetables. The goal of a good harvesting is to maximize crop yield, to minimize any crop losses and quality deterioration and to be able to keep the harvested produce in good condition until it is consumed or sold. Maturity standards, harvesting practices, harvesting containers, harvesting tools, field packing and transport conditions to the packinghouse are important factors which affect the postharvest losses and product quality **(Elik et al., 2019).**

Washing: The Produce is cleaned/washed to remove adhering dirt, dust, insects, mould and spray residues and to improve appearance (**Magray et al., 2017)**

Trimming: Trimming is done to remove unwanted, discoloured, rotten and damaged parts which enhances visual quality, reduces deterioration of produce and facilitates handling packaging and transport (**Magray et al., 2017)**.

Curing: Curing is a process of strengthening and wound periderm (skin) of root and tuber crops for a specified period under well-defined conditions of temperature and relative humidity which enhances shelf life of these crops by forming corky layer which protects against water loss and infections by decaying organisms (**Magray et al., 2017**).

Waxing: Waxing is done mainly to minimize water loss and reduce shrivelling and wilting to enhance therefore storage life. Waxing on the surface of fruit or vegetable product which are the main routes of transpiration. Waxing also improves appearance of produce. Waxes are generally applied by foaming, spraying and brushing of which foaming is the best, since it leaves a very thin coating **(Arora, 2022).**

Precooling: Pre-cooling is the process of removing field heat from the harvested commodity, particularly when harvested during hot weather. Pre-cooling helps in decreasing rate of transpiration and respiration delayed ripening and easing the load on the cooling system of transport or storage chambers (**Magray et al., 2017)**

Post- Harvest Disease Control: Vegetables suffer significantly due to invasion of fungi and bacteria causing disease and resulting in huge postharvest losses. Succulence of vegetables makes them prone to infection by microorganisms 'Mechanical injuries, contamination by diseases vegetables, heat and other environmental agencies pre-dispose products to diseases. Post-harvest diseases can be controlled by use fungicides as sprays or dips, incorporated in wax or impregnated in packaging materials (**Magray et al., 2017)**

Packaging: Packaging should strictly meet various requirements in order to preserve fruits and vegetables for longer periods of time. Traditional packaging can no longer effectively and sufficiently meet today's needs. The concept of active packaging has been defined as a packaging system actively changing the condition of the package to improve food safety, extend shelf life, enhance sensory properties and maintain the quality of the products **(Bodbodak & Rafiee, 2016).**

Transport: Transport is an important linkage in postharvest handling, storage and distribution. Serious losses take place due to improper handling, careless loading and unloading and use of improper containers. Transport of produce during cool hours of night, use of ventilated, insulated evaporative cooled or refrigerated vehicles ensures preservation of quality (**Magray et al., 2017)**.

Marketing System: It is essential that organized effort for establishing cooperative system of marketing should be enforced at village and district levels to control activity of intermediaries and to regulate the vegetable marketing smoothly and in a streamlined system. Moreover, close co-ordination among Agricultural Marketing Board, National Horticulture Board and state department of agriculture/Horticulture should be ensured to formulate an action plan for regulating marketing of vegetables in a smooth and streamlined way (**Magray et al., 2017)**.

Storage: Produce should be kept at optimum conditions during the transport. Adequate temperature control systems and air circulation systems are the most important means to ensure quality preservation of perishables. Cold chain is the logistics system that provides

ideal condition to the perishable goods from the point of source to the point of consumption through thermal and refrigerated packaging methods and logistical planning to protect the quality and increase the shelf life of these shipments **(Elik, 2019).**

Department of Horticulture, Assam (2013) observed that post-harvest losses in Horticulture sector is 25-35%. PHL is significantly high in case of Vegetables particularly Kharif vegetables as well as Rabi vegetables. To minimize the PHL attempt have been made to popularize the Food Processing sector and the Cold –chain development. Few small & medium Food processing units have been set up in different districts. Small Food processing units set up by individual or by the SHGs are unable to compete in the market. However, medium size units are performing well. Besides cold-storage Establishment of Pack house at farm gate, Supply of refrigerated Van, Integrated Cold-Chain infrastructure and Mega Food Park of the State are some of achievement to minimize the PHL.

2.2.3 Barriers faced by rural farmers in marketing Vegetables produce

Jerome (2017) stated that Agriculture being the most important sector, still it is facing lots of the problem as farmers are still in down position to get benefits of their work. They are still not having any idea about how to sale, how to get right price of their produce, they don ‘t knows how to channelize their produce and if they face any losses then how to overcome from this. They don ‘t knows the latest technologies. So far, the betterment of farmers and ultimately for the rural development there is a need to know the importance of proper marketing of agriculture produce and how the better marketing affects the farmers livelihood. The barriers faced by the farmers are as follows:

Lack of Organized Market: Majority of farmers live in villages. Organized markets have not developed in villages to sell their products. So, there are no markets to supply neither agricultural product to the customers, not agricultural inputs to the farmers in rural areas. So, agricultural market has remained unorganized **(Jeyaramya, 2022).**

Unfavourable Mandis: The condition of the mandis (markets) are highly unfavourable for farmers. Mandis lacks adequate storage facilities, compelling farmers to rely on middlemen or brokers who take away a major portion of the profits. These intermediaries often manipulate deals in favor of themselves, arhatiyas (commission agents), or wholesalers. According to a study by D.S. Sidhu, middlemen claimed 31% of the profits in rice transactions, 29.5% in vegetable transactions and 46.5% in fruit transactions **(Kumar et al., 2018).**

Unfavourable market and procurement centres: the condition of procurement centres remains unfavourable for marginal farmers due to cartelization, huge transaction cost and unfair billings to the large farmers. As a result of which farmers has to sale their produce at a much lower rate than the market price. Study reveals that the share of middle man in rice procurement goes to 32 per cent, vegetable 29 percent and fruits 46 per cent **(Pani & Jena, 2020).**

Lack of Store infrastructure: An important drawback in Indian agricultural marketing is the absence of adequate storage infrastructure. This absence compels farmers to sell their produce at lower prices, lacking the capability to securely store it until better prices prevail. The inadequate and unscientific facilities of storage lead to approximately 20% to 30% substantial grain wastage due to pests like rats and insects. Consequently, farmers suffer substantial financial losses occur as a result of inadequate storage facilities **(Kumar et al., 2018).**

Lack of Marketing Skill: Because of the lack of proper education, the small farmers and businessmen have no marketing skill. Small farmers, businessmen are not skilled in determining price, storing, packaging and grading the agricultural products. AS a result, they have not got benefits from agricultural occupation **(Jeyaramya, 2022).**

Distress Sale: Most of the Indian farmers, facing severe poverty, as the financial struggles highlights how limited access to credit prevent them from holding out for better prices. As a result, they're compelled to sell their produce quickly, often at very low rates, to local moneylenders who operate as both traders and lenders **(Kumar et al., 2018).**

Lack of Minimum Price Fixation System: There is lack of minimum price fixation system of the agricultural products. As a result, farmers have to suffer exploitation. In this way, absence of organized market, predominance of intermediaries, lack of standardization and grading, lack of warehouse and transportation facility, lack of market information, lack of minimum price fixation system are the problems of agricultural marketing **(Jeyaramya, 2022)**

Malpractices in the market: Intermediaries engage in unethical practices within the market, such as employing false weights and measurements, adulterating products and participating in black-marketing and hoarding, all aimed at making fast money while harming both suppliers and customers **(Tripathi, 2018).**

Lack of Transportation**:** Limited Road infrastructure in rural areas poses challenges for Indian farmers. This limitation hampers their ability to access larger markets where they might fetch better prices for their produce. As a result, they are compelled to sell within their villages, which may offer less favourable pricing due to the limited market reach and competition **(Kumar et al., 2018).**

Lack of Finance**:** Additional finance is essential to meet seasonal requirements. Financial need also varies from year to year based on quantity of production. In India, the majority of farmers rely on moneylenders to fulfill their financial needs. Consequently, an Indian agriculturist, born in debt, lives in debt and ultimately passes away indebted **(Raj, 2018).**

Excessive & Long chain of Intermediates: Agricultural products typically consist the longest chain of intermediaries, including wholesalers, traders, commissioners, distributors and more before reaching the end customer. With each intermediary, the price rises as it flows through each individual and ultimately, it's the customer who bears this burden. The increased cost incurred by the customer doesn't reflect back to the farmer; it is only handled these intermediaries in the market **(Tripathi, 2018).**

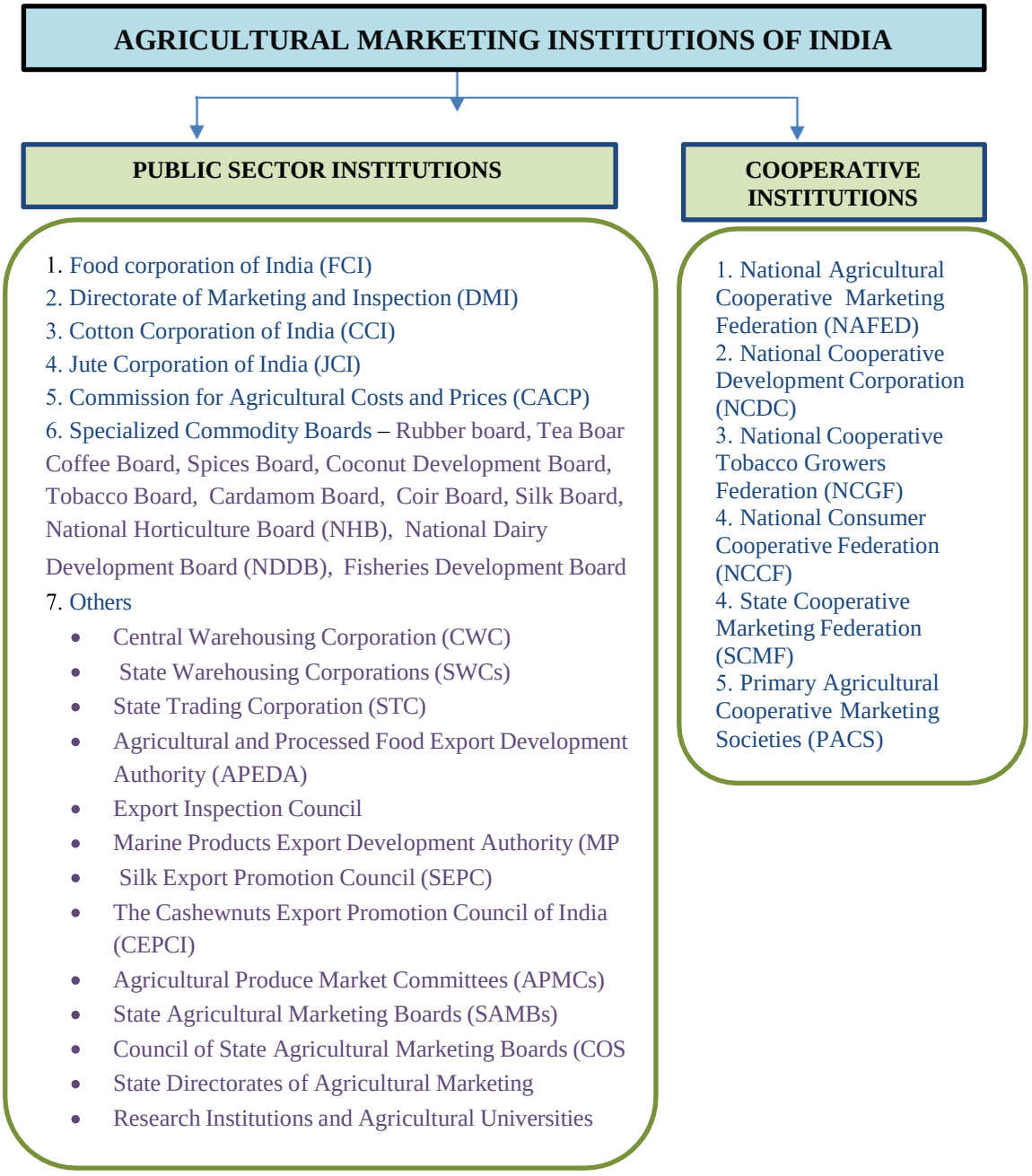
2.3 AGRICULTURAL MARKETING SYSTEM AND SCHEMES

2.3.1 Agricultural Marketing- Institutions, Agencies and Channels

2.3.1.1 Agricultural Marketing Institutions of India

Ezilamathi (2018) defined the term marketing institutions that can be considered to embrace a wide range of organizations, including associations of farmers, traders and others in the value chain, as well as cooperatives and government marketing agencies.

Kiruthika (2016) defined Marketing institutions are business organizations which have come up to operate the marketing machinery, including formulation and implementation of rules of the game. They perform one or more of the marketing functions. Agricultural marketing institutions, including individuals, corporates, cooperatives and government institutions. Their roles include regulating monopolies, licensing traders, developing market infrastructure (storage, transport, credit, grading) managing prices (minimum support prices, fair consumer prices, commission rates) and influencing supply and demand through import and distribution controls. Some important institutions in the field of agricultural marketing are:



Source: Acharya and Agarwal, 2021

FIGURE II: AGRICULTURAL MARKETING INSTITUTIONS OF INDIA

Food Corporation of India (FCI) established on 14th January 1965 under the Food Corporation Act, 1964. The aim is to ensure effective price support operations for farmers and maintain national food security by procuring, storing and distributing food grains **(Rani & Kaur, 2022).**

The Government of India had setup the Directorate of Marketing and Inspection (DMI) in the year 1935 to facilitate the implementation of agricultural marketing policies and programmes **(Directorate of Marketing and Inspection, 2023).**

Cotton Corporation of India was established on 31st July 1970 under the administrative control of Ministry of Textiles, Government of India. The mission is to help cotton farmers by ensuring them remunerative price for their produce and thereby protect their interest **(Cotton Corporation of India, 2018).**

The Jute Corporation of India Limited was created in the year 1971 with the primary objective of strengthening the jute sector by protecting the interest of the jute growers who are mostly marginal farmers **(The Jute Corporation of India, 2024).**

The Commission for Agricultural Costs & Prices (CACP) is an attached office of the Ministry of Agriculture and Farmers Welfare, Government of India. It came into existence in January 1965. The aim is to recommend minimum support prices (MSPs) to incentivize the cultivators to adopt modern technology and raise productivity and overall grain production in line with the emerging demand patterns in the country **(Commission for Agricultural Costs and Prices, 2024).**

Central Warehousing Corporation (CWC) is a public warehouse operator established by the Government of India in 1957 to provide logistics support to the agricultural sector. Its aim is to provide reliable, cost-effective, value-added, integrated warehousing and logistics solution in a socially responsible and environment friendly manner. **(Central Warehousing Corporation, 2019).**

State Trading Corporation of India Ltd. (STC) is a premier international trading company of the Government of India, engaged primarily in exports and imports operations. It was set up in 1956. The vision is to be a leading world class trading organization, continuously diversifying and delivering excellence in all areas of its operations thereby enhancing stakeholders' value **(State Trading Corporation of India, 2024).**

The Agricultural and Processed Food Products Export Development Authority (APEDA) was established by the Government of India under the Agricultural and Processed Food Products Export Development Authority Act passed by the Parliament in December, 1985. The objective of APEDA is to promote schedule products export and to

achieve these various functions has been undertaken by this body under the regulation of central government **(Agricultural and Processed Food Products Export Development Authority, 2024).**

Council of State Agricultural Marketing Boards (COSAMB) was established in 1988. It is an apex body of the state marketing board and in order to achieve an efficient agricultural marketing system, it organizes seminar, exhibition and workshops to educate various functionaries. It establishes and develops contacts with other organization both in country and abroad for the latest development in the field of agricultural marketing **(Farooqi & Ahmad, 2015).**

Cooperative Institutions

National Agricultural Cooperative Marketing Federation (NAFED) established in the year1958. The aim of this organization is to assist, plan and encourage the cooperative institutions' partners' and associates' marketing and trading endeavors in agricultural and other commodities, article and goods **(Deshmukh & Patil, 2021).**

The National Cooperative Development Corporation (NCDC) was established by an Act of Parliament in 1963 as a statutory Corporation under the Ministry of Agriculture. The functions are Planning, promoting and financing programmes for production, processing, marketing, storage, export and import of agricultural produce, food stuffs, certain other notified commodities (**TNAU, Agritech portal- Banking and credits, 2016)**.

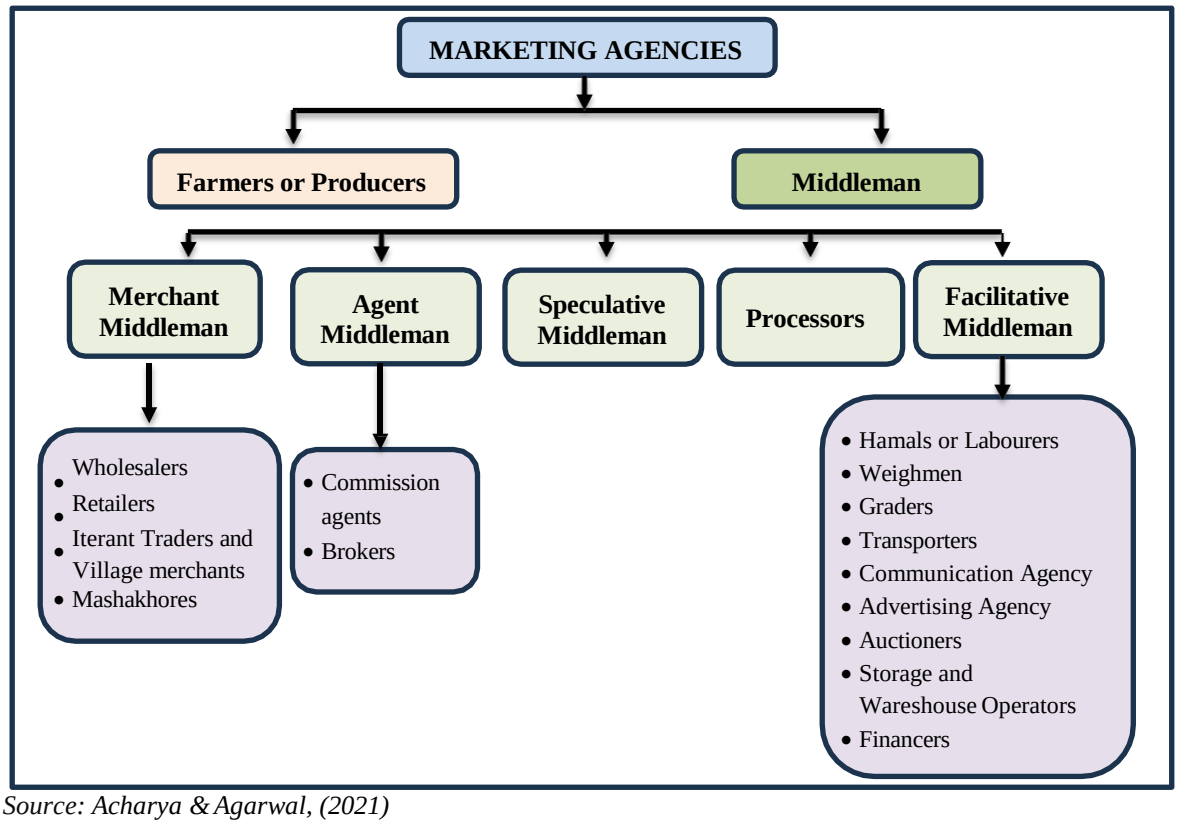
National Consumer Cooperative Federation (NCCF) was established on 16th October, 1965 to function as the apex body of consumer cooperatives in the country. It is registered under the Multi-State Co-operative Societies Act, 2002. NCCF promote consumer cooperative movement in the country, aspires to facilitate the voluntary formation and democratic functioning of cooperatives, based on self-reliance and mutual aid for overall economic betterment and financial autonomy (**National Consumer Cooperative Federation, 2024).**

2.3.1.2 Marketing Agencies

Influencer Marketing Hub (2024) explained that Agriculture Marketing Agencies are specialized marketing firms with a thorough understanding of agricultural products, market trends and consumer behaviour. They are equipped with the tools and strategies to

devise and implement effective marketing plans, conduct incisive market studies and promote practices that enhance marketing operations.

The peculiar characteristics of agricultural produce such as small and scattered production, seasonality and perishability of products, transportation and communication etc. requires a large number of intermediaries between the producer and the ultimate consumer. All the agencies more or less participate in assembling and distribution of agricultural products. Sometimes, agricultural commodities directly pass from producers to consumers. But in indirect marketing agricultural commodities generally move from producers to consumers through intermediaries or middlemen. The number of intermediaries may vary from one to many **(TNAU Agritech Portal, 2008)**



Source: Acharya & Agarwal, (2021)

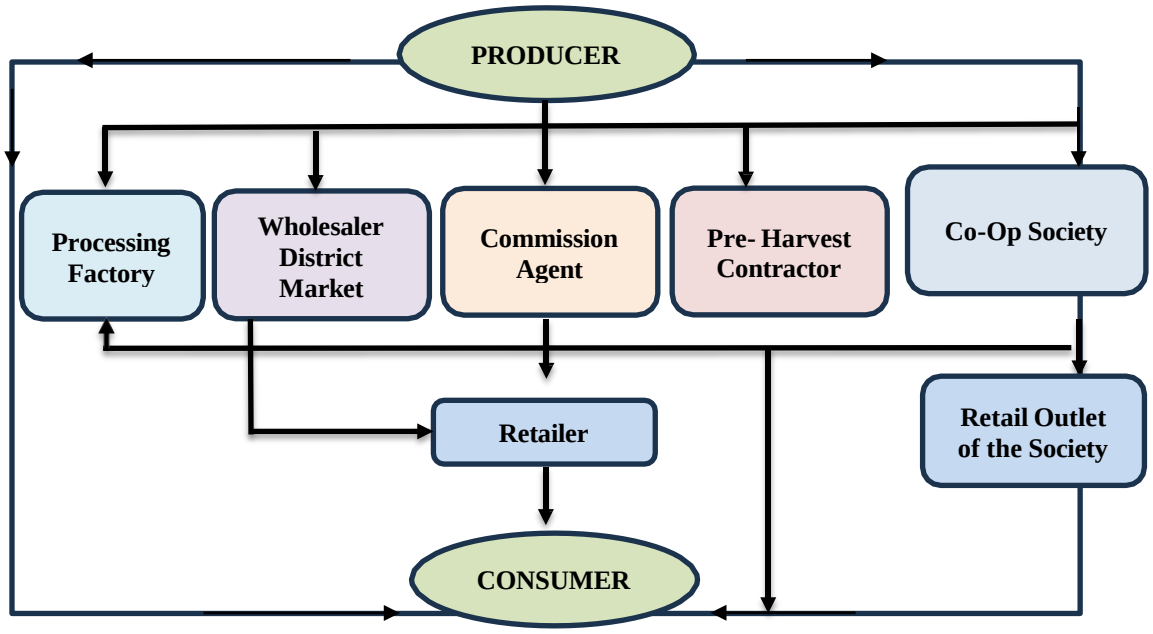
FIGURE III: AGENCIES INVOLVED IN MARKETING OF AGRICULTURAL COMMODITIES

2.3.1.3 Marketing Channels

Sengar et al., (2021) described _Marketing channels means channels through which farm products flow or move from producers to consumers. A Small portion of farm produces flow directly from producer to consumers. Generally, farm products are moves to

consumers through which various middlemen, agencies/ institutions and channels. The production of any product is to be completed when farm produce reaches in the hands of those whose need it actually it means consumers who disposed the farm product. All the goods cannot produce in all the areas due to variations of agro-climatic conditions

Acharya and Agarwal (2021) defined marketing channel in different ways- " According to Moore et al., the chain of intermediaries through whom the various foodgrains pass from producers to consumers constitutes their marketing channels'. Kohls and Uhl have defined marketing channel as alternative routes of product flows from producers to consumers.



Source: Subrahmanyam & Gajanana (2000)

FIGURE IV: VEGETABLE MARKETING CHANNELS IN INDIA

2.3.2 Schemes for Agricultural sectors

Agriculture is the backbone of India's economy, employing over half of its workforce and contributing significantly to its Gross Domestic Product (GDP). However, the sector faces numerous challenges, including low productivity, fragmented landholdings, climate uncertainties and limited access to modern technology and markets. To address these challenges and uplift the agricultural community, the Government of India has initiated several agricultural schemes and policies over the years. These schemes aim to improve farm productivity, increase farmers' income, enhance agricultural infrastructure and promote sustainable agricultural practices **(Tripathi et al., 2023).**

TABLE III

SCHEMES AND PROGRAMMES OF INDIA ON AGRICULTURAL SECTORS

Scheme Name & Launched Year	Aim
National Agriculture Market or eNAM 14th April 2016	The main objective is to integrate markets first at the level of the States/UT and eventually across the Country through a common online market platform, to facilitate pan - India trade in agricultural commodities. It is funded by Central Government and implemented by Small Farmers Agribusiness Consortium (SFAC) **(India Today, 2019).**
Agriculture Infrastructure Fund (AIF) 8th July, 2020	The key objective of the scheme is to mobilize a medium to long term debt financing facility for investment in viable projects for post-harvest management Infrastructure and community farming assets through incentives and financial support in order to improve agriculture infrastructure in the country **(Ministry of Agriculture & Farmers' Welfare, 2023)**
Gramin Bhandaran Yojana (GBY) 1st April, 2001	The objectives of Gramin Bhandaran Yojana GBY scheme is to render agricultural market credit in order to improve infrastructure of agricultural market in the country and it helps to store the agricultural products and providing facilities like grading standardization packaging distribution quality control and pledge financing facilities etc. and to bring fair prices for the agricultural product produced by the farmers in the country **(IndiaFilings, 2021).**
Kisan Credit Card loan scheme August 1998	Kisan Credit Card (KCC) scheme aims at providing adequate and timely credit support from the banking system under a single window with flexible and simplified procedure to the farmers for their cultivation and other needs such as to meet the short-term credit requirements for cultivation of crops, Post-harvest expenses; Produce marketing loan; Consumption requirements of farmer household; Investment credit requirement for agriculture and allied activities. (**Mahesh et al., 2021)**.

Scheme Name & Launched Year	Aim
National mission for sustainable agriculture (NMSA) 2014-15	National Mission for Sustainable Agriculture (NMSA) aims at making agriculture more productive, sustainable, remunerative and climate resilient by promoting location specific integrated composite farming systems; soil and moisture conservation measures; comprehensive soil health management; efficient water management practices and mainstreaming rainfed technologies (**Department of Agricultural and Cooperation, 2014).**
Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) 2015-16	PMKSY aim to enhance physical access of water on farm and expand cultivable area under assured irrigation, improve on-farm water use efficiency, introduce sustainable water conservation practices, etc. **(Ministry of Jal Shakti, 2023)**
Pradhanmantri fasal Bima Yojana (PFBY) 18th February 2016	PMFBY works on the **One Nation, One Crop, One Premium**. The objective is to provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crops as a result of natural calamities, pests & diseases, stabilize the income, encourage farmers to adopt innovative and modern agricultural practices and to ensure the flow of credit to the agriculture sector **(Ministry of Agriculture & Farmers Welfare, 2024)**
Horticulture Mission for North East & Himalayan States (HMNEH) 2005-06	Horticulture Mission for North East and Himalayan States (HMNEH) aims to achieve overall development of Horticulture in NE and Himalayan states **(Ministry of Agriculture & Farmers Welfare, 2024)**
Mission Organic Value Chain Development in Assam (MOVCD) 2015-16	MOVCDNER aims at development of commodity specific, concentrated, certified organic production clusters in value chain mode to link growers with consumers and to support the development of entire value chain starting from inputs, seeds, certification, to the creation of facilities for collection, aggregation, processing, marketing and brand building initiative in Northeast Region **(Ministry of Agriculture & Farmers Welfare, 2024)**

Scheme Name & Launched Year	Aim
Integrated Scheme for Agricultural Marketing Infrastructure (ISAM) 2017-18	ISAM supports state governments in governing the agricultural produce marketing through creation and improvement of market structures, capacity building and generating access to market information **(Ministry of Agriculture & Farmers Welfare, 2024)**
Rashtriya Krishi Vikas Yojana (RKVY) 2007-08	RKVY aims at achieving and sustaining desired annual growth during the XIIth Plan period by ensuring holistic development of Agriculture and allied sectors. The major objectives are to incentivize the states so as to increase public investment in Agriculture and allied sectors **(Department of Agriculture, Government of Assam, 2024)**
Credit Guarantee Fund Scheme (CGFS) 2013-14	The Credit guarantee Fund has been set up with the primary objective of providing a Credit Guarantee Cover to Eligible Lending Institutions (ELI's) which are providing collateral free loans to Farmer Producer Companies (FPCs)(**Government of Assam, 2023)**
Marketing Research & Information Network (MRIN) 2000	The primary aim is to establish a nationwide market information network, enabling the swift collection and dissemination of crucial information related to market prices, infrastructure and market requirements. This initiative is designed to empower farmers by enhancing their access to market data, thereby facilitating better decision-making and market realization **(Palit, 2024)**
Pradhan Mantri Kisan SAMPADA Yojana (PMKSY) May 2017	The objective of PMKSY is to supplement agriculture, modernize processing and decrease Agri-Waste (**Vikaspedia, 2020).**
Equity Grant Scheme (EGS 2013-14 onwards.	The Equity Grant Fund (EGF) enables eligible Farmer Producer Companies (FPCs) to receive a grant equivalent in amount to the equity contribution of their shareholder members in the FPC, thus enhancing the overall capital base of the FPC **(Government of Assam, 2023)**

Scheme Name & Launched Year	Aim
PM-Kisan (Pradhan Mantri Kisan Samman Nidhi) scheme 1st December 2018	The aims of this scheme is to supplement the financial needs of the farmers in procuring various inputs to ensure proper crop health and appropriate yields and commensurate with the anticipated farm income **(Export Import Bank of India, 2020).**
Paramparagat krishi Vikas Yojana PKVY 2015-16	The main goal of this scheme is to encourage natural farming in the country. Before production they should form groups and adopt natural farming in huge areas. The main intention of the scheme is to create 10,000 clusters over three years and bring out five acres of agricultural areas (**Mahesh et al., 2021)**
Mukhya Mantri Krishi Sa Sajuli Yojana (MMKSSY) 2018-19	MMKSSY aimed at promoting farm mechanization for various crop cultivations. This initiative seeks to enhance the productivity of different agricultural products and improve farming practices. By implementing this scheme, farmers can expect an increase in their income, alongside significant savings in both labour and time **(Gandash, 2024).**

2.4 DIGITAL AGRICULTURAL MARKETING – APPS AND PORTALS

2.4.1 Basic concept on Digital Agricultural Marketing

Bhosage (2018) defined Digital Marketing is referred to those strategies and techniques which use online ways to reach target customers. Digital Marketing is also known as Internet Marketing, Web Marketing, E Marketing, or Online Marketing. It is most useful to the farmers since the benefits are high and electronic systems are ready to serve customers all over the world and open for 24 hours in a day and the cost incurring is also low. He also highlights some of the benefits of E-Marketing to Farmers such as wide market: Farmers can sell their products worldwide, as it covers large number of customers of different places. Opened for 24 hours in a day so, farmers can sell their products at any time as and when they wish to sell, Right person and Right price: farmers listed their products online, choose a fair price based on the market and sell to buyers who are ready to pay that price, Less cost: There is no middlemen so there is a less cost or sometimes free of cost.

Deshmukh and Patil (2021), explained about the use of digital platforms and companies using social media, direct email, search engine optimization and interactive websites to attract potential customers, engage them and convert into a business deal. It is easier to reach a larger audience through digital marketing than through traditional methods as well as target the prospects who are most likely to buy product or service. It is also often less expensive than traditional advertising and it allows to track the progress on daily basis and allow the Consumers to stay updated with products or services. Customers can visit company‘s site, examined data approximately the items and make buys online and give feedback. Through digital marketing, consumers get clear information about the products or services.

Reddy (2021) expressed the importance of Digital Marketing in Agriculture, as mobile cell phone is becoming an important need & necessity for the farmers to progress with the digital marketing and it‘s information. Every farmer wants to market their agricultural products and services for the best prices traditionally or through internet enabled systems. When compared with the traditional marketing the digital marketing is more effective and affordable. Digital marketing is helping all the small farm holding & large farm holding farmers (marginal, small, medium & large farmers) to find the multiple buyers for their produces and get higher prices. At the same time the buyers/ customers/consumers are also getting the farm fresh products for reliable prices as the commission agents & middle men are not getting involved in the digital marketing system.

Bose and Ravi (2021) elucidated the advantages of digital marketing and it attempts to examine how the digital market is a step to sustain in global competitive markets. The complete focus towards digital marketing is the need of the hour, however there is still low focus on it. After focusing on Enablers of digital marketing of agricultural products on how digital marketing will improve the scope of this sector.

2.5.2 Mobile Applications and Portals for Agriculture Sectors

2.5.2.1 Mobile Applications

AgSpeak: AgSpeak is a multi-lingual app that helps farmers manage their farms and monitor distress activities. AgSpeak for farmers with the goal of leveraging Artificial Intelligence (AI) for increased production. The app will help farmers manage their farming needs and remotely monitor distress activities through their smartphones or computers **(Gupta, 2023).**

Kisan Rath app: The Mobile Application named ―Kisan Rath‖ facilitates Farmers and Traders in identifying right mode of transportation for movement of farm produce ranging from food grain (cereal, coarse cereal, pulses etc), Fruits & Vegetables, oil seeds, spices, fiber crops, flowers, bamboo, log & minor forest produce, coconuts etc. This App also facilitates traders in transportation of perishable commodities by Reefer (Refrigerated) vehicles. Kisan Rath App will greatly facilitate farmers, FPOs and Cooperatives in the country to have the choice to find a suitable transport facility to transfer their agriculture produce from farm gate to markets (**Press Information Bureau, 2020).**

Agri app: AgriApp is an Android-based mobile application. It provides complete information on Crop Production, Crop Protection, smart farming with agriculture and allied services. In addition to being an information portal, AgriApp is also an online marketplace for bringing in farmers, Agri input, retailers & fulfillment services on a common digital platform **(Ministry of Electronics and Information Technology, 2023)**

Fasal Salah Agriculture app: FASAL SALAH‖ is an informative Mobile app which is designed to help farmers by providing real time personalized crop advisory based on current & forecast weather. FASAL SALAH provides accurate weather forecasts (Temperature, Humidity, Wind Speed & Direction, Rainfall) for next 10 days at taluk & village level. FASAL SALAH is unique and farmer friendly. It can be read, it can be heard **(Fasal Salah, 2023).**

IFFCO: The IFFCO Kisan Agriculture app, developed by the Indian Farmers' Fertilizer Cooperative Ltd., provides farmers with information in multiple formats, including text, photos, audio and video, across 11 languages, including English. It offers modules such as agro advisory, weather details and market prices, along with helpline numbers to connect with Kisan Call Centre Services. A key feature, "Ask the Experts," allows farmers to consult with agricultural experts for advice, where they can send pictures of infected plants and receive personalized solutions through voice calls **(Kanagraj & Nanandaraja, 2021).**

Pusa Krishi: Pusa Krishi mobile app was launched for farmers in order to take the technology to farm fields. This app was developed by Ministry of Agriculture and Farmers Welfare, Government of India. Farmers can use this app to learn about new crop varieties produced by the ICAR, resource saving cultivation techniques, farm machinery tools and

implements and other development technologies. In this app, a feedback section is available that enables the farmers to have a conversation with stakeholders on a real-time basis **(Kanagraj & Nanandaraja., 2021).**

Crop Insurance app: Government of India spends huge amounts in extending crop insurance to the farmers so as to provide them relief in case of unforeseen eventualities. Crop insurance is extended by both public and private insurance companies. States/UTs nominate insurance companies to extend insurance cover for different crops in districts/blocks **(Department of Agriculture & Farmers Welfare, 2022).**

Kisan Suvidha: Kisan Suvidha is a mobile app developed by the Ministry of Agriculture and Farmers Welfare, Government of India, to provide farmers with essential information in multiple languages, including English, Hindi, Tamil, Gujarati, Odia and Marathi. It offers real-time weather updates and alerts, daily market prices for commodities, agro advisory services in regional languages and soil health card information. The app also provides details about seed, pesticide, fertilizer and farm machinery dealers, as well as guidance on plant protection, pest management and crop development. Additionally, farmers can upload images of affected crops for expert advice and connect directly with the Kisan Call Centre for support **(Kanagraj & Nanandaraja, 2021).**

AgMart- Agrimarket App: This application is developed by the IT department of Ministry of Agriculture in the country. It is intended to keep farmers informed about crop prices and discourage them from conducting distress sales through the mobile application. With the AgriMarket Mobile App, farmers can access information about crop prices within 50 km of their own device location. This app consequently captures the area of the agriculturists utilizing versatile GPS and brings the showcase costs of crops which drop inside the extend of 50km. The prices of agri commodities are sourced from the Agmarket portal. Currently, the app is available in English and Hindi languages **(Deshmukh & Patil, 2021).**

eNAM: eNAM Mobile App was developed by Small Farmers‘ Agribusiness Consortium (SFAC), Ministry of Agriculture & Farmers Welfare, Govt. of India. NAM is a Govt. of India sponsored pan-India electronic trading platform that connects existing mandis to establish a single national market for agricultural commodities. The aim of this app os to encourage or motivate remote bidding by traders and to provide farmers and other

stakeholders on their smartphones with access to arrivals and price related details. **(Kanagraj & Nanandaraja, 2021).**

APEDA Farmer Connect : APEDA Farmer Connect app was developed by Agricultural and Processed Food Products Export Development Authority (APEDA). A farmer may use this app to apply for farm registration and approval from the state government, as well as lab sampling from approved laboratories. The farmer is able to track the status of applications. The information can only be accessed by an authorised state government official, farmer or a registered laboratory. State Horticulture Departments can use the mobile app to collect information about farmers, their lands and products of farm and also farm inspections on real time basis. This app has in-built GPS system to recognize the location of the farm **(Kanagraj & Nanandaraja, 2021).**

2.5.2.2 Portals

e-Choupal: e-Choupal is an initiative by ITC Limited that uses the internet to directly connect with rural farmers in India for procurement of agricultural products. It started in the year of 2000. ITC has distributed computers, & has given the internet access in the villages where farmers can directly discuss about the price and other information. Farmers collect the information on market prices, good farming practices, weather forecast through the digital media. They can also purchase the required agro chemicals, manures & other farm products by internet enabled digital media. ITC is running kiosks in the villages by their registered & trained farmers. Each kiosk can serve more than 600 farmers in the nearby 10 villages in a radius of 5 K.M **(Reddy, 2021)**

e-NAM Portal: National Agriculture Market (NAM) is a pan-India electronic trading portal launched on 14th April, 2016 completely funded by Central Government and implemented by Small Farmers Agribusiness Consortium (SFAC). NAM portal networks the existing APMC (Agriculture Produce Marketing Committee) / Regulated Marketing Committee (RMC) market yards, sub-market yards, private markets and other unregulated markets to unify all the nationwide agricultural markets by creating a central online platform for agricultural commodity price discovery. The scheme envisages deployment of a common e-market platform of 585 selected[1] regulated wholesale agriculture market yards by March, 2018. The common electronic trading portal is called as e-NAM (**Government of Delhi, 2016).**

AGMARKNET: Electronic trading portal integrating 585 markets across 16 states. More than 164.53 lakh M.Ts of farm commodities have been transacted on e-NAM. It is developed to transport the agri products from one market to another in smooth way to save the produce (**Reddy, 2021)**

e-Krishi Kendra: It is an agriculture portal that provides a unified network for farmers, agribusiness sector and agri-experts that works towards the making of Digital Indian Agriculture. It is an online platform of Agriculture's digital services having strong focus on e-agriculture, farming ecommerce, e-retailing, e-agrotrading, e-marketing, e-commerce, e-learning, agro-industries, farm- to-laboratory, farm-to-table etc. This portal integrates and processes data from multiple sources in to a single hub **(Chadha et al., 2020).**

KISAN Mandi Online Agris: On April 26, 2016, it established itself in the market as a private limited company and was later designated as a startup by the Department of Industrial Policy and Promotion of the Government of India. The first agricultural company in India to launch a free online marketplace for farmers is Kisan Mandi Online Agri Market Private Limited (KisanMandi.com). With the aid of Gramme Sahayaks, KisanMandi.com is helping farmers with the grading, packing and logistical support they need to sell their agricultural products directly to consumers. This will enable farmers to receive a higher price for their crops than what the APMC mandi pricing now offers **(Kathait et al., 2023).**

2.6 RELATED RESEARCH STUDIES

Kshash and Oda (2023) conducted a research on, ―Marketing behaviour of vegetable growers in Al-Qassim district, Babil Province, Iraq‖ focused on practices that affect profitability. Surveying 200 randomly selected farmers, the research found that about three-quarters displayed medium marketing behaviour. Farmers primarily used plastic and mesh bags for packaging and sold their produce to wholesalers at the local market immediately after harvest, often using rental vehicles for transportation and receiving full payment on the spot. Neighbours, relatives and progressive farmers were the main sources of market information, while newer farmers exhibited higher marketing behaviour scores than more experienced ones. The study emphasizes the need for strategies to improve marketing practices, suggesting better access to market information, enhanced infrastructure and training programmes.

Gayathri and Saha (2022) undertook research on, ―Study on Marketing Behaviour of Uzhavar Sandhai 'Vegetable Farmers During Covid 19 in Coimbatore District of Tamil Nadu‖ examined the challenges faced by farmers during the pandemic, using a sample of 50 sellers. Results showed a medium level of overall marketing behaviour, with significant issues including a lack of transportation facilities and non-availability of buyers. The study also highlighted the need for grading-based fixed prices in the markets.

Kowsalya et al. (2021) conducted a research on, ― A Study of Tomato Growers Marketing Behaviour in the Dindigul Area of Tamil Nadu‖ focused on the Marketing behaviour of tomato growers. The study found majority of respondents (64.16 per cent) had a medium level of overall marketing behaviour, followed by 23.34 per cent of them having high and only 12.5 percent of them having low level of marketing behaviour. Also, out of thirteen characteristics taken for the study six characteristics namely age, occupation, experience, market perception, market decision and market intelligence had exhibited significant and positive correlation with marketing behaviour. Marketing behaviour is inversely connected with information seeking behaviour, credit orientation and market orientation factors.

Gogoi (2020) carried out a study on, ―Identifying the Structure of Agricultural Market in Assam: A Look into the Existing System‖ focuses on the present agricultural marketing status in Assam and agricultural market structure operating in Assam. The study indicated that the agricultural markets in Assam is still operating to a great extent in its traditional form. Taking into account the concept of market structure, the agricultural market in the state is found to be somewhat perfectly competitive. With a large number of buyers and sellers trading in close substitutes, the prices are determined by the forces of demand and supply. No individual seller has the freedom to influence the price and as such ends up becoming a price taker. The marketing system here also allows a seller to freely enter and exit as marketing is carried out mainly through the primary and unorganised markets.

Sandhu and Kaur (2020) undertook a study on, ―Marketing of Agricultural Produce: An Attitudinal Analysis of Farmers‖ explores the effect of the various factors affecting farmers' attitude towards the marketing of agriculture produce. In the study data has been collected from 505 respondents using a convenience sampling technique. Exploratory factor analysis and confirmatory factor analysis have been used to explore the factors. The results of regression analysis revealed that four dimensions namely lack of infrastructure,

cost, lack of transportation and unfair practices have a positive impact on farmers' attitude towards agricultural marketing produce.

Pasha and Paramashivaiah (2020) conducted research on, ―Marketing Behaviour and other Attributes of Vegetable Growers-A Study at Tumakuru District in Karnataka‖ identified key factors influencing cultivation performance, including information from village extension officers and costs related to picking, cultivation and maintenance. Challenges such as poor information, high costs, lack of fertilizers, storage and transport shortages, insufficient rain, inadequate pesticides and price fluctuations due to seasonal gluts were found to impact farmers' performance.

Phukan et al., (2018) carried out a study on ―Marketing Behaviour of Vegetable Growers in East Sikkim‖ stated that the marketing behaviour of a farmer which is influenced by numerous factors. It was found that about 18 per cent respondents acquired market information from neighbours/ relatives and 43 per cent respondents had medium level of marketing knowledge about vegetables. The lack of proper local market yard facilities was the major problem (95%) while 100 percent respondent suggested the establishment of wholesale market within the state. Establishment of new wholesale market in Sikkim can improve market information as well as enhance competition leading to improved efficiency in the exchange process.

Raahinipriya and Jansi Rani (2018) conducted a study on, ―Marketing Behaviour of Organic Farmers in Karur district of Tamil Nadu‖ identified 10 components namely time of sale, price fixing criteria, mode of sale, mode of transport, expenditure incurred on transport, place of sale, reason for selection of market, distance of the market, source of market information and collection of money. They also revealed that the respondents were found to have medium to high level of marketing behaviour. The reason that the respondents had a good knowledge about the marketing trend so as to get good price for their produce. The respondents also received market information through mobiles and some of the respondents were registered farmers of Domestic & Exports Market Intelligence Cell (DEMIC), Tamil Nadu Agricultural University. Most of the farmers had subscribed to monthly magazines like TNAU 's Valarum Velanmai and Pasumai Vikadan.

Kumar et al. (2018) undertook research on, ―Marketing Behaviour of Vegetable Growers in Uttarakhand hills‖ put forth the marketing behaviour of the vegetable growers

and constraints in marketing of vegetable produce. Results revealed that most farmers sold their produce at distant markets, using private transportation. They practiced grading and spent over six hours weekly on farm activities, with market choices influenced by relatives, friends and merchants. Key challenges included high middlemen commissions, fluctuating prices, lack of nearby markets, high transport costs and packaging expenses. Solutions suggested include forming horticulture-based self-help groups, organizing weekly markets, enforcing market regulations and providing market guidance to growers.

Rai and Dubey (2018) conducted research on ―Marketing behaviour of vegetable growers of Jabalpur district of Madhya Pradesh‖ where the study was conducted purposively in Panagar block of Jabalpur district due to highest vegetable production among the other blocks of the district. Results revealed that majority of the respondents had medium (56.67%) level of marketing behaviour. They also express that to make vegetable production more profitable and sustainable in the context of globalization. Government should give fair deal in establishing markets at the village level and dissemination of latest market information to the farmers in the right time.

Maratha and Badodiya (2017) undertook research on, ―Study on Marketing Behaviour and Other Attributes of Vegetable Growers at Kota Block of Kota District in Rajasthan‖ proclaimed on the attributes of vegetable growers, determine the marketing behaviour of vegetable growers, analyze the relationship between attributes of vegetable growers and their marketing behaviour, enlist the problems of vegetable growers and obtain suggestions. The study revealed that majority 72.50 percent respondents had medium level of marketing behaviour about vegetables. All the 13 selected attributes of vegetable growers, were found positive and significant relationship with marketing behaviour except age, farming experience, extension participation and innovativeness in vegetable production. And coefficient of determination R2 was 0.7862.

Magray et al. (2017) conducted research on post-harvest management of vegetable crops: Introduction‖ explained a complex series of metabolic adjustments occur in vegetables after harvest which are influenced by dislocation of supply of nutrients, water and growth regulators from the parent plant to the harvested vegetables. The overall process leads to postharvest deterioration of the produce. However, the losses can be reduced with adoption of postharvest management and use of processing technology of

vegetable crops about the minimization of post-harvest losses by various technological adoptions There are two approaches, the first approach for loss reduction is to follow scientific postharvest management of vegetables. Another approach for loss reduction in processing into value added products.

Hatai (2016) carried out research on, ―Farmers response on agricultural marketing information system in Meghalaya‖ explores the extent of awareness on arrivals, prices in local markets and other markets, quality / grade of produce required, post-harvest handling of agricultural produce was found to be higher than small and medium size farmers. The extent of utilization of agricultural market information by different categories of sample farmers were in decision making on production, selling and post-harvest handling. It was observed that the sources of agricultural market information at household level were radio, newspaper and television for small farmers. At the market level, commission agents were most predominant sources for all categories of farmers. There is need of proper dissemination of market intelligence and information through all possible means of communication for improving the marketing efficiency.

Bojkic et al., (2016) conducted research on, ―Digital Marketing in Agricultural Sector‖ , IRENET - Society for Advancing Innovation and Research in Economy, showed that digital marketing represents a huge opportunity for Agri-marketers. They took a sample on 200 student respondents to find out their knowledge about agricultural applications like Ag DNA, Agren Soil Calculator, AgriApp, Agric business, Agricultural chemicals, Agro Guide, Agri Market, etc. The results showed low awareness and interest in digital marketing and agricultural apps. The study concluded that young, educated individuals need to engage more with agriculture to ensure its progression into the 21st century.

Srinivas et al., (2016) undertook a research on, ―Marketing behaviour of vegetable growers‖ articulated about tempos and plastic crates for transporting and packing produce, selling immediately after harvest in nearby markets with on-the-spot payments. Commission agents and relatives were key information sources. Price fluctuation was a major issue. To improve profitability, the study suggested government support in establishing village markets, providing timely market information, setting up cold storage and processing units and ensuring adequate transport facilities.

Chokera et al., (2014) conducted a research on ―The Role of Agricultural Marketing on Empowering Rural Farmers in Masvingo Province, Zimbabwe, focuses on four issues major crops grown, current markets for produce, institutions that support farmers and challenges faced by farmers in production, pricing, promotion and transporting produce to profitable markets. Rural farmers lack market information as they still rely on the traditional selling approach and they also recommend government to improve the state of the roads; establish training centres to equip farmers with marketing skills.

Matsane and Oyekale (2014) carried out a study on, ―Factors Affecting Marketing of Vegetables among Small-Scale Farmers‖ identified and analyse factors affecting (constraints) marketing of vegetables among small-scale farmers. The prominent constraints such as: lack of access to credit, lack of access to storage facilities, lack of market information, lack of finance for farming, poorly developed village markets, poor producer prices, high perishability of produce, low patronage, inadequate access roads, small size of transport and high transportation costs. Variables that significantly influenced monthly net farm income were: gender, farm size, number of employees, access to storage, grading of products and access to extension services.