"Performance Evaluation of e-National Agriculture Market"

Research Team

Dr. S.R. Singh
Principal Investigator

Dr. Satish Chandra Pant
Co-Investigator

Mr. Sathyendra A.D.
Co-Investigator

October, 2020

CCS NATIONAL INSTITUTE OF AGRICULTURAL MARKETING
(An Autonomous Organization of Ministry of Agriculture and Farmers Welfare, Government of India)
Kota Raod, Bambala, Pratap Nagar, Jaipur-302033, Rajasthan

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Dr. P. Chandra Shekara

Director General

Foreword

Agriculture and agribusiness has been one of the important sectors in terms of providing food safety and security to the nation as well as income security of household. At this point of time agricultural marketing can play an important role by providing more options for selling of agricultural produce in the market. Government of India is playing an important role in creation of unified marketing system in the country.

Agricultural marketing is one of the way by which income of farming family can be enhanced through-NAM by providing more access in the market to the farmers.

Emergence of e-NAM in the country can play an important role through bringing the transparency in the system, weighment and payment through online to the farmers, transparent biding system, encourage quality production so that benefit of e-NAM transferred to the farmers.

I am certain and hopeful that this study would make significant contribution for strengthening implementation of e-NAM in the country and also give insight for effective execution of system in future.

Dr. P. Chandra Shekara

Director General

CCS NIAM, Jaipur

Acknowledgement

The idea of evaluation of e-NAM emerged in the month of October, 2019 while a discussion took place in the official meeting of Director General CCS NIAM with Joint Secretary (Marketing). In consequence of the discussion the proposal of **"Performance Evaluation of e-National Agriculture Market"** came in to the platform. After that a research outline emerged through a series of presentation in the mind of research team constituted at CCS NIAM for this study.

It was an important journey learning travelled by research team to find out a logical conclusion from the pan India study of e-NAM.

On behalf of research team, I would like to thank Dr. P. Chandra Shekara, Director General, CCS NIAM for constant help and encouragement time to time during the study and also provide all kind of freedom in conducting the study.

The research team would also like to thank Sh. P.K. Swain, Joint Secretary (Agricultural marketing) for his continuous support to the study right from the beginning and providing valuable input in designing the schedule for data collection. He was constantly in touch with the research team available for any kind of support required for the study.

On behalf of Research Team and I personally convey my gratitude and thanks from my bottom of heart to all mandi secretary, commission agent, traders, Farmers, Farmers Producer Organizations they have been very supportive and helpful during the data collection from the field by the team of students.

The research team is feeling highly obliged and acknowledge the contribution of first year students of PGDM (ABM) of CCS NIAM who have completed the collection of data from nook and corner from the field in a time bound manner and support to study and enabling us to submit the report in time.

The research team would also like to thank all faculty and staff members of CCS NIAM for constant support during the study.

I would also like to convey my sincere gratitude to Sh. Debashish Acharjee and Sh. Ravi Chandra, from Nagarjuna Fertilizers and Chemicals Limited, a Strategic Partner for providing support and input during the study.

I would also like to convey my sincere thanks to entire research team for their knowledgeable input, analysis of data and help in report writing and enabling to complete the study in time.

At the end, entire research team thanks to everyone who made efforts and contribute in any means in completion of the study.

I, and entire team is of the opinion and trust that this study will be helpful in guiding states in effective implementation of e-NAM and also helpful to researchers, scholars, farmers and farmer producer organizations of the country and contribute in strengthening the agricultural marketing system of the country.

CCS NIAM, Jaipur
October, 2020

(Dr. S.R. Singh)
Principal Investigator

Chapter-1

Introduction

1.1 Role of Agriculture in Indian Economy

India is an agrarian economy having varied agro-climatic zones suitable for cultivation of wide range of crops such as cereals, pulses, horticultural crops, medicinal and aromatic plants, flowers etc. In India, agriculture has remain a major source of livelihood since ages and contributes around 16% to the GDP and provides employment to 60% population in different ways and means. It also plays a significant role in the export of agricultural produce, commercial and industrial development and thereby contributing in national income and livelihood support to the people. Indian farmers are capable to grow all kind of crops under limited resources to meet out their social and family needs as well as to feed the nation. In 2018-19, Indian achieved record food grain production marked 285.17 million tonnes of produce. Similarly, in case of horticultural production it has reached 310.14 million tonnes in 2018-19 (PIB, 2020). India ranks 2nd in fruits and vegetables production in the world, behind China. As per the National Horticulture Database, during 2015-16, India produced 90.2 m. tonnes of fruits and 169.1 m. tonnes of vegetables.

1.2 Needs for Robust System of Agricultural Marketing

India has achieved Rainbow revolution as an integral development programme of agriculture, horticulture, forestry, sugarcane, fishery, poultry and animal husbandry. It includes the integration of all the other agricultural revolutions like Green revolution, Blue revolution, Yellow revolution, white revolution etc. Now the next revolution needed in the farm sector is agricultural marketing. In the context of leveraging agriculture for improving nutrition and health with an aim to eliminate hunger and malnutrition, now the focus should be on better marketing of agricultural produce in the context of sustainability perspective of farming community in the agribusiness. So, modernization of agricultural marketing is a key necessity for better linking the farmers to local markets, distant markets and even to international market.

It is in this context, Government of India has brought several reforms in agricultural marketing right from 1960s through passing The Agricultural Produce

Marketing (Regulation) Act that brought radical changes and significant improvement in almost all aspects of marketing of farm produce. Again in 2003, the Government has passed the State Agricultural Produce Marketing (Development and Regulation) Act, 2003 and introduced the concept of establishment of private markets/yards, direct purchase Centers, consumer/farmers markets for direct sale and promotion of Public Private Partnership (PPP) for strengthening market infrastructure. In 2016, Government of India has introduced 'electronic-National Agricultural Market (e-NAM)' with a view to provide an online trading platform for agricultural commodities to address the issues associated with forward linkages. Later, the Union Ministry of Agriculture and Farmers' Welfare drafted the Model Agricultural Produce and Livestock Marketing (Promotion & Facilitation) Act, 2017 and this helped in bringing major agricultural marketing reforms to help farmers directly connect with the different buyers and enable them to discover optimum price for their commodities. This Act, 2017 also promoted e-NAM platforms to make transactions, especially price determination, totally transparent and also increased access of farmers to distant markets even at the national level. On 2nd April, 2020 the Government has added two new features to the e-NAM viz., Warehouse-based trading module – this facilitate the farmers and traders by trading from the premises of warehouses. It will be based on negotiable warehouse receipts available in an electronic form or e-NWR and FPO-based trading module – this will allow the farmers to get access to the e-NAM platform from the Farmer Producer Organizations (FPO's) collection centers. These modules mainly aim at de-congesting mandies as well as maintaining the supply chain of agricultural commodities. Recently, in 2020, the Government of India has passed three Ordinances viz., Farmers Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020; the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020; and the Essential Commodities (Amendment) Ordinance, 2020. All these Ordinances are aimed to create an ecosystem to promote e-trade (via e-NAM) to enhance transparency in trade operations and integration of markets across geographies, ensure both the farmers and traders have the freedom of choice in terms of sale and purchase of agricultural produce, promote efficient, transparent and barrier-free, inter-state and intra-State

trade beyond the existing physical marketplaces, strengthening the requisite infrastructure for electronic trading of the produce. Further, the Government also announced Rs 1 lakh crore Agri-Infrastructure Fund for strengthening farm-gate infrastructure for farmers. Under this fund, financing facility will be provided to strengthen agri-infrastructure projects at farm-gate and aggregation points (Primary Agricultural Cooperative Societies, Farmers Producer Organizations, Agriculture entrepreneurs, Start-ups, etc) to set up cold stores and chains, warehousing, silos, assaying, grading and packaging units, e-marketing points linked to e-trading platforms and ripening chambers etc. Among the post-harvest infrastructure, strengthening of e-NAM for online trading of agricultural commodities deserves special mention, as it facilitates real time price discovery in a transparent manner thereby increasing competition among traders resulting in better remunerative prices to farmers. So, considering the importance of e-NAM in providing a transparent, systematic, quick, accurate, hassle free marketing system to the farmers, it is felt appropriate by the researchers to analyse its impact on efficient price realization to farmers and benefits realized by the farmers and other stakeholders in the marketing process of agricultural commodities

1.3 Genesis of e-NAM

In the era before trade liberalization, the focus of the Government is to achieve food security to the mounting population, But with the advent of LPG phase in 1991 and WTO in 1995, more emphasis is being given trade related aspects of Indian agriculture. But, the present agricultural marketing system in India is confronted with various loopholes and defects and even after 70 years of Indian Independence, the farmers and traders are facing several traditional marketing problems like: lack of adequate Storage facilities, Grading facilities, Processing facilities, Transportation facilities, Marketing information network etc. In the context of LPG phase, some more problems were added to these traditional problems viz., lack of quality consciousness on the part of the farmers and traders, cultivating crop varieties not suitable for processing and importers' requirements, stringent Sanitary and Phyto-sanitary standards, no cost-effectiveness production, higher transaction costs, changing customers priorities or preferences towards RTE & RTC foods. In view of

these changing circumstances, it is high time to make the agricultural marketing system in India more vibrant and responsive enough to ensure remunerative prices to the farmers in a fair and transparent manner. This led to the launch of e-NAM on 14th April 2016 to ensure online trading platform for agricultural commodities. This market is facilitating the farmers, traders and buyers with online trading of commodities and further helps in better price discovery of their produce. Even some attractive features like MIS dashboard, BHIM and other mobile payments, enhanced features on the mobile app such as gate entry and payment through mobile phones and farmers database is helping its adoption even more. Following are the salient features of e-NAM:

- Help to integrate markets, at the state-level and national-level through a common online platform that would facilitate a pan-India trade in agricultural commodities
- Help to streamline marketing and transaction procedures and establish uniformity across all markets within the country to promote the efficient functioning of these markets
- Enhance better marketing avenues for both the seller (farmers) and the buyers (trader)
- Put in place quality testing facilities that would help in better-informed bidding by buyers
- Promote stability in pricing and ensure the availability of quality products to the consumers
- Ensure transparent sale of produce and price discovery of agricultural commodities
- Harmonization of quality standards of agricultural produce and provision for assaying (quality testing) infrastructure in every market to enable informed bidding by buyers. Common tradable parameters have so far been developed for 125 commodities.
- Single point levy of market fees, i.e. on the first wholesale purchase from the farmer.

- Provision of Soil Testing Laboratories in/ or near the selected mandi to facilitate visiting farmers to access this facility in the mandi itself.

As on 15th May, 2020, 1,000 wholesale mandies, located in 18 States and 3 Union Territories (UTs) got integrated with the e-NAM (Table 1 and Figure 1). While 585 mandies were integrated in the first phase, 415 mandies were integrated in the second phase. The 144 mandies integrated are in Rajasthan followed by 122 in Uttar Pradesh, 122 in Gujarat, 118 in Maharashtra and 81 in Haryana. e-NAM, which was launched in April 2016, is being implemented by Small Farmers Agribusiness Consortium (SFAC), a Central Government agency, with the support of State Governments. The purpose of e-NAM is to create a network of existing mandies on a common online market platform as 'One Nation, One Market' for agricultural commodities in India. Since April, 2016 ie., in the last four years, e-NAM has registered a user base of 1.66 crore farmers, 1.31 lakh traders, 73,151 commission agents and 1,012 FPOs. As on 14th May, 2020, farmers have transacted over Rs 1 lakh crore on the e-NAM platform with a trade volume of 3.43 crore tonnes of commodities, and 38.16 lakh bamboo and coconuts. Presently, 175 commodities, including food grains, oil seeds, fruits and vegetables are traded on e-NAM (Table 2).

Table 1: Number of APMC mandies of 18 States and 3 UTs doing online trading (e-NAM)

S.No	State/UT	Mandies integrated to e-NAM
1	Andhra Pradesh	33
2	Chandigarh	1
3	Chhattisgarh	14
4	Gujarat	122
5	Haryana	81
6	Himachal Pradesh	19
7	Jammu And Kashmir	2
8	Jharkhand	19
9	Karnataka	2
10	Kerala	6
11	Madhya Pradesh	80
12	Maharashtra	118
13	Odisha	41
14	Puducherry	2
15	Punjab	37

16	Rajasthan	144
17	Tamil Nadu	63
18	Telangana	57
19	Uttar Pradesh	125
20	Uttranchal	16
21	West Bengal	18
	Total	841

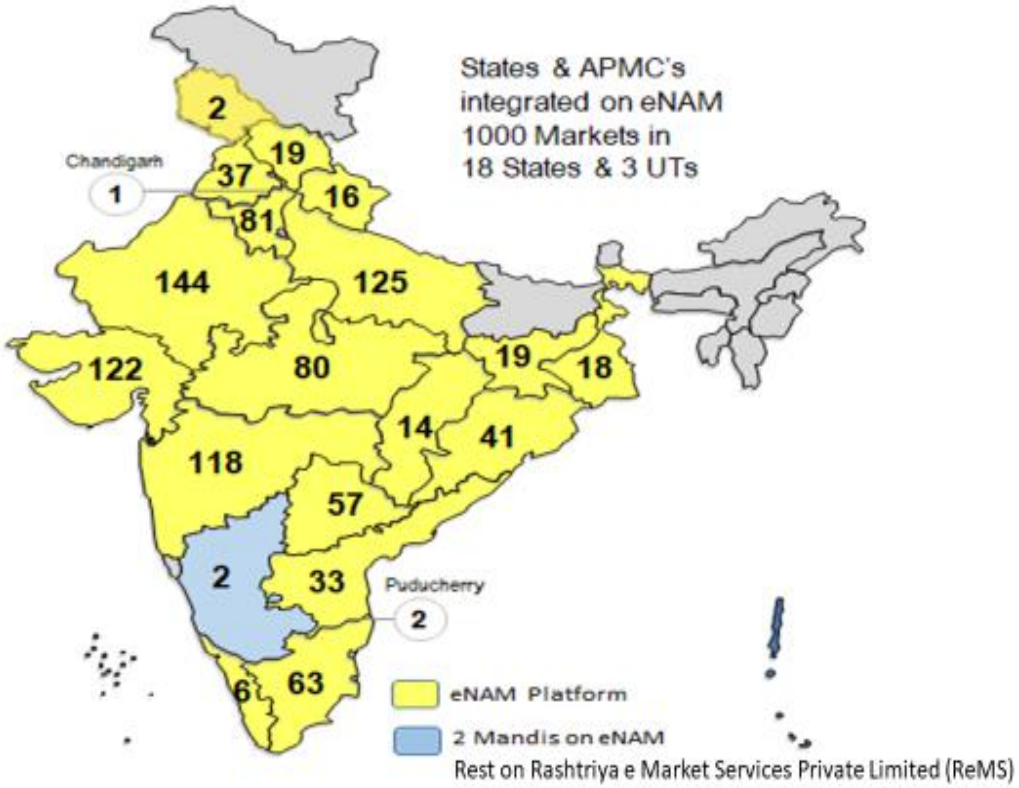


Figure 1: State-wise Number of Markets with eNAM facility in India

Table 2: Commodities dealt under e-NAM

S.No	Category	Number of commodities	Commodities dealt
1	Food grains	26	Arhar, Arhar Dal Split, Bajra, Barley, Basmati rice, Buck Wheat, Chakhao Or Black Rice, Chana Dal Split, Chana whole, Horse Gram, Jowar, Kabuli Chana Whole, Lobia Maize, Masoor whole, Moong Dal Split, Moong whole, Moth, Oats Raw, Paddy, Ragi, Rajma, Urad Dal Split, Urad whole, Wheat, White Peas
2	Oilseeds	14	Castor seed, Cotton Seed, Kusum seed,

			Linseed, Mustard seed, Neem Seeds, Nigar Seed, Peanut kernel, Pongam seeds, Rapeseed, Sal Seed, Sesame seed, Soyabean, Sunflower seed
3	Fruits	31	Amla, Apple, Apricot, Banana, Ber, Cherry Red / Black, Custard apple, Grapefruit, Grapes, Guava, Jackfruit, Jamun, Kinnow, Lemon, Litchi, Mango, Musk melon, Orange, Papaya, Papaya Raw, Passion Fruit, Peach, Pear, Pineapple, Plum, Pomegranate, Raw Mango, Sapota, Strawberries, Sweet orange, Watermelon
4	Vegetables	50	Aloe Vera, Banana Raw, Beetroot, Bhindi/Okra, Bitter gourd, Bottle gourd, Brinjal, Broccoli/Calabrese, Button Mushroom, Cabbage, Capsicum, Carrots, Cauliflower, Cluster beans, Colocasia vegetable, Coriander leaves, Cucumber, Curry Leaves, Drumstick, Fenugreek Leaves, Garlic, Gherkin, Ginger, Green chillies, Ivy gourd, Jimikand (Suran), Lobia Pods, Mint Leaves, Mustard leaf, Onion, Oyster Mushroom, Pea, Pointed gourd, Potato, Pumpkin, Reddish, Ribbed celery, Ridge Gourd, Safed Petha, Sem, Snake Guard, Spinach, Sponge Gourd, Spring Onion, Sugar Snap Peas, Sweet Corn, Sweet potato, Tapioca, Tinda, Tomato
5	Spices	16	Ajwain, Black Pepper Whole, Cardamoms Whole, Cloves Whole, Coriander whole, Cumin, Dried Raw Mango Slices, Dry Ginger, Fennel seed, Fenugreek seed, Large cardamom, Mace Whole, Poppy Seed, Red chilli, Tejpata, Turmeric
6	Miscellaneous	38	Anthurium, Areca nut (betel nut), Bamboo, Betel leaves, Carnation, Chhappan Kaddu, Chironji, Chrysanthemum, Coconut, Coconut with Husk, Cotton, Gerbera, Gladiolus, Groundnut with pods, Guar seed, Hilsa, Isabgol, Jaggery, Jute Seeds, Lily, Mahua flower, Mahua Seed, Marigold, Nutmeg Whole, Persimmon, Raisins, Raw Cashew nut, Raw Jute, Rittha, Rose Cut Flower, Safed Musli, Saffron, Spray Chrysanthemum, Tamarind, Tender coconut, Tuberose, Tulip, Walnuts Inshell

Objectives of the Study: Following are the specific objectives formulated for this in depth study:

1. To assess the status of e-NAM implementation with specific focus on technology adoption, operation and infrastructure creation.
2. To study the effect of e-NAM on prices received by the farmers.
3. To analyse the stakeholders' perceptions about operations and benefits of e-NAM.
4. To examine the extent of inter-mandi and inter-state trade through e-NAM.
5. To suggest appropriate policy measures and implementation mechanism for effective execution of e-NAM.

At the time of launching of e-NAM in April, 2016 the farmers are restricted to sell their produce at APMC mandies across different States. The online selling of agricultural produce through e-NAM portal is expected to give choice to farmers to transact their produce both in physical mandies or through online platform. However, the ease of access to transact the produce through online has enabled the farmers to realize more remunerative prices, reduced transaction costs, more transparency in sale and purchase of produce and prompt payment of sales proceeds. Further, with the advent of COVID-19, strengthening of e-NAM platforms across mandies, FPOs, farmers' cooperatives etc., gained more prominence, as it facilitates distant bidding facility without physical presence of buyer/trader near the auction site. Further, it ensures e-payment facility through which traders can pay farmers, after the trade is executed from anywhere in the country. So, to decongest mandies during COVID-19 lockdown situation, the Government has launched new features on the e-NAM platform, enabling direct trading from warehouses as well as collection centers of FPOs, besides logistics support. Even the recent Ordinances passes by the Government of India viz., Farmers Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020 and the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020 are aimed to promote e-trade to enhance transparency in trade operations and integration of markets across geographies. This highlights the importance of e-NAM marketing and

accordingly this in depth study on assessing its impact on the farmers and other stakeholders assume greater significance.

CHAPTER-2

Review of Literature

An acquaintance with related literature of past studies is an important aspect for doing research and for sound research methodology. It provides the researchers a proper direction to carry out their research work and enable them to arrive at meaningful results of the study. At the same time this also takes practical definitions of various concepts and terms into consideration, used in the study. In other words, review of literature provides some basic ideas to any researcher in conducting research study more realistic and comparatively more easy and appropriate.

As the present study on "Impact Evaluation study of electronic-National Agriculture Market (e-NAM) in India" is first of its kind in assessing the impact of e-NAM on status of e-NAM implementation with specific focus on technology adoption, operation and infrastructure creation, prices received by the farmers, stakeholders' perceptions about the operations and benefits of e-NAM etc., and no prior studies are conducted on the similar lines in India, this made the present study a certainly contributing one. Further, as the study area is relatively new, very few studies have been conducted and hence, they are thoroughly reviewed to serve as backdrop for this in depth study.

MANAGE (2018) conducted a study on e-NAM in Telangana and suggested the role of e-NAM in the integration of grading and assaying, weighment, amalgamation of logistics, banks and Negotiable Warehouse Receipt (NWR) for the benefit of farmer's leading to fair price discovery.

Reddy (2018) in his study on e-NAM in Karnataka examined experiences of e-markets with an objective to suggest improvements for the effective functioning of e-NAM. Results of the study indicated that e-markets are inducing competition and minimizing the collusion among traders resulting in increased farmers price and market arrivals. It also facilitates competitive bidding and same day payments to farmers. However, it was found that, there was some resistance among the traders and commission agents as they felt that benefits of physical transactions are better than e-auction. In addition, there was a fear of accountability during the online transactions.

The study also compared the differences in market processes between traditional markets vis-a-vis e- markets in Karnataka.

Yadav et.al. (2017), concluded that an efficient marketing system requires good governance, policy support, better infrastructure and services including market information, assaying, networking etc. Hence, they suggested that the e-NAM platform can be further strengthened by encompassing these factors into the system.

Yadav and Sharma (2017) stated that National Agriculture Market will be the game changer for the Indian farming community. They also stated that e-NAM would provide the farmers more options for sale of their produce and increase the accessibility of market to farmers through warehouse based sale and obviates the need to transport the produce to the mandies. However, it will happen when e-NAM become fully operational throughout the country and the eventual goal of 'One Nation One Market' for agricultural produce will become a reality.

Chand. (2016) opined that the full benefits from e-NAM can only be realized when a single license for trading is valid across the states, so that farmers can get advantage of competitive environment and selling their produce to anywhere in the country for price realization.

Chand (2016) conducted a study on e- Platform for National Agricultural Market in Karnataka and found that full benefit from linking agriculture markets in the country and putting them on electronic platform will be ensured when a single trading licence is valid across the country and when the farmers gets the option to sell her/his produce in any market throughout the country.

Timberlake et al. (2016) examined the barriers for the implementation of electronic benefit transfer (EBT) in farmers' markets. The result of the study show that understanding the main barriers as well as effective strategies for successful implementation of EBT in farmers markets is imperative to realize the full potential of this program. Understanding difficulties from market managers' perspectives is important to inform future policy initiatives to streamline reimbursement at farmers markets.

Yu (2016) conducted a study on the application of electronic commerce in food supply chain and food safety. The authors observed that through combination of food supply chain and electronic commerce, food enterprises can ensure the food safety better and improve the market competitiveness comprehensively.

Bhera et al. (2015) attempted to highlight the importance of ICT in improving marketing activities of retail agri-business of Indian economy. This study discussed vast potential of implementing the same in Indian agricultural business activities with some success stories/models for justification of the importance of ICT in agri-retail marketing.

Sruthi (2015) conducted a study on e- purchasing power of consumers toward food, groceries, fruits and vegetables in Bengaluru city. The e-purchasing behaviour of consumers towards food, groceries, fruits and vegetables was analyzed based on data collected from 120 sample e-purchasers in four areas of Bengaluru city. The consumers' attributes for preference towards e-purchasing was analyzed through Garett's Ranking Method. The results of study revealed that the source of awareness about e-purchasing for considerable per cent of consumers was through friends (39.17%) and advertisement (38.33%).

Asadihkoob and Ebrahimi (2014) investigated the challenges and solutions of e-commerce in Iran's agriculture. The paper is based on the descriptive and analytical tools The research findings showed that e-commerce can provide many advantages like profitability, elimination of intermediaries, agricultural production market development, farmers' awareness of market prices, and access to national and international markets, increasing competition and improving the quality of agricultural products.

Alavioon and Allahyari (2013) conducted the study on socio-cultural characteristics of rice e-marketing user: case of Rasht Township, Iran. This study used a survey design and was conducted with a random sample of 367 paddy farmers in Rasht Township. The researchers employed "Kurskal-Wallis" and "U Mann-Whitney" tests to identify the effective factors on e-marketing. The results revealed that around 68% of the farmers had high tendency for the adoption of electronic

marketing and more than 70% of the respondents chose rural ICT offices for rice e-marketing.

Gal (2012) investigated on e-commerce aspects in agriculture and found out that a significant numbers of internet users are purchasing through online, unlike farmers. This is because, the latter are not aware of how e-commerce works in case of agricultural products.

Kolageri (2012) conducted a study on consumers' perceptions about e-marketing in Bangalore city. Primary data are collected randomly from consumers through pre-tested structured schedule. Most of the consumers preferred e-marketing service because of its easy transaction, cost effectiveness, discounts on products and multiple choices for a single product, door delivery, quick responding service and security on debit and credit card accounts. Eighty five per cent of the consumers have fair perception about e-marketing service. The researcher also found out that e-marketing service is used by males (60.00%), middle age (93.33%), above graduates (91.00%), employees (54.17%) and middle income group (65.00%).

Cofas (2009) conducted a study on electronic commerce and electronic marketing of agricultural products in Bucharest, Romania. The study revealed the use of Internet for efficient marketing of farm produce through e-commerce implementation. From this study, the researcher also concluded that electronic commerce enable more customers to influence agricultural marketing decisions.

Mukhtar and Burgen (2009) observed that internet marketing provided better understanding for small business enterprises particularly owners and managers in performing a transition from traditional to new marketing approach which helped them to improve their productivity as well as to stay competitive in market.

Matani (2007) studied on the importance of IT in improving marketing activities of retail business in agricultural areas of Indian economy. He found out that IT should be used for maintaining an updated and enriched database of a region for timely dissemination of the information pertaining to soil enrichment, seed selection, actions relating to arrival of monsoon etc. to the farmers. In addition, information

regarding agricultural products, demand-supply status in respect of different products and the current prices should be made available (on-line) to the farmers for taking timely decisions on crop diversification strategies and positioning of the same in right market to get optimum revenue. The educational and professional institutions should provide the latest information using IT as a tool and make it available to the farmers.

FAO (2005) study on common agriculture market reveals that the agriculture market is dominated by rural based primary markets that meet local demand, secondary markets demand and wholesale and retail market demands. These markets are located generally far from most of the villages and hence, to reach these far distance places is quite tedious and costly affairs for the small and medium farmers. As a result, they found it economical to sell their produce to the intermediaries which fetches lower the prices to the farmers. Involvement of intermediaries works out a margin for themselves and escalating the cost in the next phase and thus it is the farmer (being the first seller) who gets less share in the consumer's rupee.

Schiefer et al. (2004) analyzed developments in electronic trade platform infrastructures in the agri-food sector of the US and Europe between 2000 and 2002 and identifies development strategies of successful platforms. Of 85 platforms in the year 2000, only 25 remained active in 2002. But there are still market entries of new platforms and existing platforms form various types of partnerships. The analysis could identify a range of strategic development lines of successful platforms.

Doluschitz et al. (2002) analyzed the potential for electronic business (e-business) in the agricultural sector of Germany. The results indicate that the agricultural sector provides good opportunities for e-business. Technical equipment for information and communication is also available as well as the willingness and necessary skills for its application. It is therefore suggested that the internet will soon spread quickly and become widely established in the agricultural sector.

Dass et al. (2001) examined the application of e-commerce in agriculture and the authors stated that electronic commerce in agriculture over the internet will open the new way of business. In this, the authors developed a framework on the basis of

commercial internet business and traditional practice in India. The authors also provide guidelines for the role of e-commerce in agricultural marketing.

CHAPTER-3

Methodology

This chapter is devoted to discuss the methodology adopted in present study. In very beginning of the chapter, sampling design is dealt whereas scope of study, method of enquiry of data, scope and nature of enquiry and analytical tools were discussed later on.

3.1. Sampling Design:

i. Selection of States: As discussed earlier, so far 1,000 wholesale mandies located in 18 States and 3 Union Territories (UTs) got integrated with the e-NAM. In the present study, 31 mandies from 13 States (Table 3.1) were selected based on frequent consultations held with respective State Agricultural Marketing Boards (SAMBs) and phase-wise implementation of e-NAM in these States. Different categories like Super A, A, B and C class are also taken into consideration for the selection of mandies across the States.

ii. Selection of Commission Agents: From the selected mandies, 110 commission agents were selected at random (Table 3.1)

***iii. Selection of Traders*:** From the selected mandies across different States, 164 traders were selected at random (Table 3.1).

iv. Selection of Farmers: Out of 31 mandies, 615 farmers were selected at random (Table 3.1).

***v. Selection of FPOs*:** The FPOs are selected in two phases. During Phase I (Table 3.1), 27 FPOs are selected and in the second phase (Table 3.2), 29 more FPOs from Rajasthan, Uttar Pradesh and Chhattisgarh are selected, thus making total sample size of 56 FPOs.

Table 3.1: Sample Size across Different Stakeholders during Phase I

S. No.	Mandi	Stakeholders						State
		Mandi Secretary	Commission Agent	Trader	Farmer	FPO	Total	
1.	Kashipur	1	5	5	20	0	31	Uttranchal
2.	Haldwani	1	0	5	19	1	26	
3.	Dehradun	1	5	5	20	0	31	
4.	Solan	1	5	5	20	0	31	Himachal Pradesh
5.	Shimla	1	5	5	20	0	31	
6.	Kullu-	1	5	5	20	0	31	
7.	Nokha	1	5	5	20	0	31	Rajasthan
8.	Mandawari	1	5	5	20	2	33	
9.	Ramganjman	1	5	5	20	0	31	
10.	Khandawa	1	0	5	20	2	28	Madhya Pradesh
11.	Itarsi	1	0	5	20	0	26	
12.	Khammam	1	5	5	20	1	32	Telangana
13.	Nizamabad	1	5	5	20	2	33	
14.	Suryapeta	1	5	5	20	1	32	
15.	Charkhi Dadri	1	5	5	20	0	31	Haryana
16.	Ellenabad	1	5	5	20	0	31	
17.	Karnal	1	5	5	20	2	33	
18.	Akola	1	5	5	20	2	33	Maharashtra
19.	Dound	1	5	5	20	1	32	
20.	Nabrangpur	1	0	10	20	0	31	Odisha
21.	Sakhi Gopal	1	0	10	19	2	32	
22.	Bareilly	1	5	5	20	0	31	Uttar Pradesh
23.	Puranpur	1	5	5	20	0	31	
24.	Agra	1	0	5	20	0	26	
25.	Lucknow	1	5	5	20	0	31	
26.	Modasa Bhiloda	1	0	5	20	0	26	Gujarat
27.	Dahod	1	5	5	20	2	33	
28.	Annamalai	1	5	5	20	5	36	Tamil Nadu
29.	Gobichettypalayam	1	0	5	20	2	28	
30.	Simlipal	1	5	5	19	2	32	West
31.	Hazaribagh	1	0	4	18	0	23	Jharkhan
Total Respondents		31	110	164	615	27	947	

Table 3.2: Sample Size across Different Stakeholders during Phase I

S. No.	Mandi	FPO	State
1.	Niwai	5	Rajasthan
2.	Bandikui	3	
3.	Fathenagar	3	
4.	Jodhpur	4	
5.	Baran	4	
6.	Auraiya	4	Uttar Pradesh
7.	Kanpur	4	
8.	Jagdalpur	2	Chhattisgarh
	Total	**29**	

3.2. Collection of Data: This study was based on both primary and secondary data. Primary data are collected from farmers and other stakeholders involved in transactions through e-NAM mandies through employing pre-tested schedule. The schedules were prepared on the basis of objectives laid down in this study. At first, tentative schedules were prepared and tested in the village and when these were found fit to provide necessary information on various objectives, they were finally adopted for the enquiry. Five schedules in all were canvassed for the purpose of enquiry.

At first, general information about the selected e-NAM mandies was obtained from the respective APMC Secretary. The survey method was followed for detailed enquiry of the individual farmers and other stakeholders. The main source of data for this in depth study were obtained by field survey. The survey was based on personal interview technique of selected farmers and stakeholders who approach the e-NAM mandi for transacting the farm produce. Thus, selected farmers and stakeholders across the States form the ultimate sampling units from whom the requisite primary information have been collected by the investigators through personal interview method. In addition, requisite secondary data are also collected from published reports of APMCs and SFAC. Simple tabular analysis is employed to arrive at valid conclusions.

***Tabulation and Analysis*:** The data collected was summarized and presented in tabular form for to perform simple statistical tools like averages, percentages etc., so as to arrive at meaningful interpretations.

Chapter 4

Results and Discussion

4.1 Status of e-NAM implementation in selected mandies: Selected mandies were established under the respective State Agriculture Produce Marketing Acts or any other relevant Act of the respective States

For effective implementation of e-NAM, Centre Government had given one-time grant of Rs.75 lakh to each mandi to facilitate establishment of e-NAM platform to ensure better system of marketing. Out of total assistance provided to each market, Rs. 30 lakh was allocated for creation of IT and Quality assaying laboratory infrastructure, Rs. 40 lakh was meant for developing grading/sorting and packaging facility and remaining Rs. 5 lakh towards waste management and for compost unit in the mandi.

4.1.1 Profile of Selected mandies: The profile of selected mandies with respect to establishment of e-NAM and related infrastructure are shown through Table 4.1.

Table 4.1: Profile of Selected mandies

Sl. No.	Items	Units	Rajasthan			Uttar Pradesh		
			Ramganj Mandi	Nokha	Mandawari	Lucknow	Puranpur	Bareilly
1	e-NAM Introduced	Date	14.04.16	14.02.17	14.02.17	30.11.16	00.09.16	1.10.16
2	e-NAM Bidding Hall	Number	1	1	1	1	Y	Y
3	E-Gate entry Facility	Number	2	1	1	1	Y	Y
4	E-Gate entry at Display Shed	Y/N	1	1	1	N	Y	Y
5	Net Connection-e-NAM Hall	Mbps	8	4	4	10	10	10
6	Net Connection Gate Entry Room	Mbps	8	4	4	10	5	10
7	Generator	Number	1	1	1	1	2	-
8	Electronic Weighing Machine/Bridge	Number	-	1	-	1	1	1
9	POS Machine	Y/N	N	N	N	N	N	-

10	Data Entry Operator	Number	4	6	2	1	7	4	
11	IT Staff	Number	-	-	1	0	-	-	
12	Mandi Analyst	Number	1	1	1	0	1	1	
13	Grading Staff	Number	1	1	2	2	2	2	

It is heartening that, the relevant infrastructure required for establishment of e-NAM facility viz., bidding hall, e-gate entry facility, e-gate entry at display shed, net connection in e-NAM hall, net connection at gate entry room, generator, electronic weighing machine/bridge, POS machine, data entry operator, IT staff, analyst and grading staff etc., are provided in the selected mandies. However, e-gate entry at display shed facility is not equipped in Lucknow mandi of Uttar Pradesh. Further, no staff pertaining to IT and mandi analyst are available in this mandi. In Rajasthan, electronic weighing machine/bridge facility is not available in Mandawari and Ramganj mandies. POS machine facility is not available across all the selected mandies in both the States... Generator facility for power back up (which is considered essential at times of power cuts) is not available in Bareilly mandi of Uttar Pradesh. Compared to Rajasthan, the selected mandies in Uttar Pradesh enjoy more grading staff.

Table 4.1 (cont'd): Profile of Selected mandies

S. No.	Items	Units	UP	Uttrakhand			Madhya Pradesh	
			Tundla	Dehradun	Haldwani	Kashipur	Khandwa	Itarasi
1	e-NAM Introduced	Date	23.06.17	16.03.18	15.03.18	16.03.17	3.03.17	16.02.17
2	e-NAM Bidding Hall	Number	1	Y	1	1	Y	1
3	E-Gate entry Facility	Y/N	Y	Y	Y	Y	Y	Y
4	E-Gate entry at Display Shed	Y/N	**N**	Y	N	Y	Y	Y
5	Net Connection-e-NAM Hall	Mbps	5	Y	10	10	4	10
6	Net Connection Gate Entry Room	Mbps	5	Y	5	10	4	10

7	Generator	Number	1	1	1	2	2	2
8	Electronic Weighing Machine/Bridge	Number	1	2	2	1	-	-
9	POS Machine	Number	0	-	0	-	Y	Y
10	Data Entry Operator	Number	2	2	1	1	6	8
11	IT Staff	Number	-	-	-	-	-	1
12	Mandi Analyst	Number	1	1	0	-	-	-
13	Grading Staff	Number	1	-	0	2	5	5

Similarly, e-gate entry at display shed facility is not available in Tundla and Haldwani mandies of UP and Uttrakhand States respectively. It is again disappointing to note that, POS machine is not provided across the selected mandies of UP and Uttrakhand States. Compared to these two States, the selected mandies in Madhya Pradesh enjoy better facilities except in terms of electronic weighing machine and no mandi analyst staff. Even the selected mandies of Uttrakhand are devoid of market analyst staff. However, compared to UP and Uttrakhand States, grading staff are comparatively much higher in selected mandies of Madhya Pradesh.

Table 4.1: Profile of Selected mandies

S. No.	Items	Units	Gujarat		Telangana		Odisha	
			Dahod	Bhiloda	Nizamabad	Khammam	Nabrangpur	Sakhigopal
1	e-NAM Introduced	Date	14.04.16	1.09.16	14.04.16	15.10.16	01.01.17	08.02.17
2	NAM Bidding Hall	Number	Y	1	Y	2	Y	1
3	E-Gate entry Facility	Y/N	Y	Y	Y	Y	Y	Y
4	E-Gate entry at Display Shed	Y/N	Y	Y	Y	Y	Y	Y

5	Net Connection in e-NAM Hall	Mbps	8	-	10	20	4	24
6	Net Connection at Gate Entry Room	Mbps	8	-	10	20	4	24
7	Generator	Number	-	-	2	2	5	1
8	Electronic Weighing Machine/Bridge	Number	6	1	50	35	1	-
9	POS Machine	Y/N	-	N	Y	Y	N	N
10	Data Entry	Number	-	6	6	18	6	3
11	IT Staff	Number	-	1	13	-	2	Y
12	Mandi Analyst	Number	1	1	-	-	-	-
13	Grading Staff	Number	2	1	12	-	1	2

The e-NAM facility was introduced in 2016 in selected mandies of Gujarat and Telangana in 2016, whereas the same was introduced in the selected mandies of Odisha in 2017. It is heartening that most of the facilities required for running e-NAM platform were successfully installed across all the mandies of the above three States. However, the important facilities like Net Connection in e-NAM Hall and Net Connection at Gate Entry facilities are not available in Bhiloda mandi of Gujarat and hence, it is not possible to run the e-NAM portal. Similarly, generator facility for power back up, which is considered very essential at times of power cuts is not available in Dahod mandi of Gujarat. Further this mandi is handicapped in terms of lack of data entry and IT staff. However, in case of other two States, mandi analyst staff are not available and especially in Telangana, the staff position with respect to IT, mandi analyst and grading are totally lacking. Again, the selected mandies across Gujarat and Odisha States are devoid of POS machine facility, as in case of Rajasthan and Uttar Pradesh. Compared to other two States, the selected mandies of Telangana viz., Khammam and Nizamabad are working efficiently because of availability of more number of electronic weighing machines and bridges.

Table 4.1: Profile of Selected mandies

Sl. No.	**Items**	Units	**Haryana**	**Maharashtra**	**West Bengal**

			Charkhi Dadri	Ellenabad	Karnal	Dound	Akola	Simlipal
1	e-NAM Introduced	Date	August,	April,	Nov,	2.04.17	23.11.16	-
2	e-NAM Bidding	Number	1	1	Y	1	1	-
3	E-Gate entry	Y/N	Y	Y	Y	Y	1	N
4	E-Gate entry at Display Shed	Y/N	N	Y	Y	N	0	N
5	Net Connection in e-NAM Hall	Mbps	10	-	10	Y	2 (4MBPS)	10
6	Net Connection Gate Entry Room	Mbps	10	-	10	Y	1 (4 MBPS)	-
7	Generator	Number	-	2	1	1	1	-
8	Electronic Weighing	Number	-	7	8	-	0	2
9	POS Machine	Y/N	Y	Y	N	Y	0	N
10	Data Entry Operator	Number	5	3	4	7	6	4
11	IT Staff	Number	0	-	0	1	0	-
12	Mandi Analyst	Number	-	-	1	1	1	-
13	Grading Staff	Number	3	-	0	3	3	2

It is evident from the above table that, the basic infrastructure facilities required for successful operation of e-NAM like bidding hall and e- gate entry facilities are found available across all the mandies, except Simlipal mandi of West Bengal. This mandi in West Bengal is completely devoid of basic facilities like E-Gate entry, E-Gate entry at Display Shed, Net Connection at Gate Entry Room, Generator, POS machine, no mandi analyst and IT staff. The prime facilities required to operate e-NAM viz., Net Connection in e-NAM Hall and Net Connection Gate Entry Room are lacking in Ellenabad mandi of Haryana. Further this mandi is not provided with staff regarding IT, mandi analysts, and grading function. Similarly, in Charkhi Dadri mandi of Haryana, the basic facilities like generator and electronic weighing (in Maharashtra also) are lacking. A close perusal of the table infers that almost all the selected mandies (except Maharashtra) are devoid of staff in performing day to day marketing transactions.

Table 4.1: Profile of Selected mandies

Sl. No.	Items	Units	Tamil Nadu		HP		
			Annamalai	Perindurai	Bandrol	Dhalli (Shimla)	Solan

1	e-NAM Introduced	Date	20.03.18	22.03.18	25.09.16	14.04.16	14.04.16
2	e- NAM Bidding Hall	Number	1	0	-	1	1
3	E-Gate entry Facility	Y/N	1	0	Y	1	Y
4	E-Gate entry at Display Shed	Y/N	1	0	-	Y	Y
5	Net Connection in e-NAM Hall	Mbps	8	10	-	6	10
6	Net Connection Gate Entry	Mbps	8	10	-	6	10
7	Generator	Number	0	1	-	1	0
8	Electronic Weighing Machine/Bridge	Number	2	2	1	1	2
9	POS Machine	Number	0	0	-	-	Y
10	Data Entry Operator	Number	1	6	6	3	2
11	IT Staff	Number	0	1	5		0
12	Mandi Analyst	Number	1	1	-	1	1
13	Grading Staff	Number	1	3	2	1	0

It is evident from the above table that e-NAM facility was introduced in 2016 in Bandrol, Dhalli and Solan mandies of Himachal Pradesh and in 2018 in Annamalai and Perindurai mandies of Tamil Nadu. Annamalai mandi in Tamil Nadu and Dhalli and Solan mandies in Himachal Pradesh are provided with adequate facilities compared to other selected mandies of these two States. Essential infrastructure required for effective operation of e-NAM like e-NAM bidding hall, e-gate entry facility, e-gate entry at display shed are not available in Perindurai mandi of Tamil Nadu. Similarly, in Bandrol mandi of Himachal Pradesh is also not equipped with the essential infrastructure like e-NAM bidding hall, E-gate entry at display shed, net connection in e-NAM hall and at gate entry room and generator which is considered essential for effective implementation of e-NAM. This is because, without internet

connection, it is not possible to run the electronic platform for bidding purpose. As in case of other States, POS facility is not available across all the selected mandies of Tamil Nadu and in Bandrol and Dhalli mandies of Himachal Pradesh. Compared to other mandies, the staff position with respect to IT and grading are relatively poor in Himachal Pradesh compared to Tamil Nadu.

Implementation of e-NAM in selected mandies: Table 4.2 depicts that in almost all the selected mandies across the selected States, majority of the basic infrastructural requirements such as electronic gate pass (entry and exit), e-bidding, display, e-agreement, assaying lab were installed and are effectively functioning for smooth implementation of e-NAM. However, electronic weighbridge and warehouse integration are found missing in majority of the States. In case of warehouse integration, States like Telangana (Nijamabad mandi), Gujarat (Bhiloda mandi), Madhya Pradesh (Itarsi mandi), Odisha (Nabrangpur mandi) and Uttrakhand (Dehradun mandi) are performing well and this is really an encouraging move from these respective State Governments. This is because, the integration of mandies with local warehouses will provide information about the place of storage of the commodities to the stakeholders. This will ensure demand-supply balance to ensure remunerative prices to the farmers and at the same time buyers can purchase the produce at affordable prices.

However, the selected mandies of Rajasthan and Uttar Pradesh are devoid of warehouse integration facility. To be more precise, compared to Rajasthan, the selected mandies in Uttar Pradesh are not fully equipped with essential facilities like electronic bidding (Lucknow mandi) integration of weighment with e-NAM portal (Lucknow and Tundla mandies), lack of electronic gate pass, electronic display, and exit pass generated (Tundla mandi). Even all the selected mandies in Rajasthan are devoid of integration of weighment with e-NAM portal facility. Further, warehouse integration was totally lacking across all the selected mandies in the above two States.

Table 4.2: Status of implemented e-NAM infrastructure in sample mandies (APMCs)

S. No	Particulars	Rajasthan			Uttar Pradesh			
		Ramganj	Nokha	Mandawari	Lucknow	Puranpur	Bareilly	Tundla
1	Electronic Gate Passes	✓	✓	✓	✓	✓	✓	✕
2	Electronic Bidding	✓	✓	✓	✕	✓	✓	✓
3	Electronic Display	✓	✓	✓	✓	✓	✓	✕
4	Exit Pass Generated	✓	✓	✓	✓	✓	✓	✕
5	e-Agreement	✓	✓	✓	✓	✓	✓	✓
6	Generation of Sale Receipt	✓	✓	✓	✓	✓	✓	✓
7	Assaying Lab	✓	✓	✓	✓	✓	✓	✓
8	Announcing Highest bid price to farmer by SMS	✓	✓	✓	✓	✕	✓	✓
9	Integration of weighment with e-NAM portal	✕	✕	✕	✕	✓	✓	✕
10	Online Settlement	✓	✓	✓	✓	✓	✓	✓
11	Warehouse Integration	✕	✕	✕	✕	✕	-	✕

Source: Primary Observations of Research Team during the survey

Table 4.2: Status of implemented e-NAM infrastructure in sample mandies (APMCs)

S. No	Particulars	Uttrakhand			Madhya Pradesh		Gujarat	
		Haldwani	Dehradun	Kashipur	Khandwa	Itarsi	Bhiloda	Dahod
1	Electronic Gate Passes	✕	✓	✓	✓	✓	✕	✕

2	Electronic Bidding	✓	✓	✓	✓	×	✓	×
3	Electronic Display	×	×	✓	✓	✓	✓	×
4	Exit Pass Generated	×	×	✓	×	✓	✓	×
5	e-Agreement	✓	✓	✓	✓	✓	✓	×
6	Generation of Sale Receipt	✓	✓	✓	✓	✓	×	✓
7	Assaying Lab	✓	✓	✓	✓	✓	✓	✓
8	Announcing Highest bid price to farmer by SMS	✓	✓	✓	×	✓	✓	✓
9	Integration of weighment with e-NAM portal	×	✓	✓	×	✓	✓	×
10	Online Settlement	✓	✓	-	✓	✓	✓	✓
11	Warehouse Integration	×	✓	×	×	✓	✓	×

Source: Primary Observations of Research Team during the survey

Even the selected mandies of Haldwani and Dehradun in Uttarkhand are not equipped with important facilities like Electronic Display and Exit Pass Generated compared to Kashipur mandi. Further, in Haldwani and Kashipur mandies, there is no warehouse integration. On the whole, Kashipur mandi is relatively better equipped with e-NAM facilities unlike, Haldwani and Dehradun mandies. Similarly in Madhya Pradesh, Itarsi mandi had no basic facility viz., electronic bidding, unlike Khandwa mandi. However, the former is well equipped with Integration of weighment with e-NAM portal and Warehouse Integration. Dahod mandi of Gujarat is not fully equipped with essential facilities like electronic gate passes, electronic bidding, electronic display, exit pass, e-agreement, integration of weighment with e-NAM portal and Warehouse Integration, unlike Bhiloda mandi. It is further disappointing to note from the tables that, warehouse integration facility is lacking in majority of the selected mandies across Telangana, Odisha, West Bengal, Haryana, Himachal Pradesh, Maharashtra and Tamil Nadu. Even the integration of weighment with e-NAM portal

was found lacking in majority of the selected mandies across Odisha, West Bengal, Haryana, Himachal Pradesh, Maharashtra and Tamil Nadu States.

The above discussion implies that the basic infrastructure required to execute e-NAM operations in the selected markets viz., internet connection in Bhiloda mandi (Gujarat), Ellenabad mandi (Haryana), Bandrol mandi (Himachal Pradesh) are found lacking. In the context of linking farmers to markets, it is high time to promote warehouse integration, but unfortunately this mechanism was found missing in majority of the mandies across the selected States. These two facilities help to realize the objectives of e-NAM in true letter and spirit and at the same time help to decongest the market yards.

Table 4.2: Status of implemented e-NAM infrastructure in sample mandies (APMCs)

S. No	Particulars	Telangana			Odisha		West Bengal
		Nizamabad	Khammam	Solan	Nabarangpur	Sakhigopal	Simlipal
1	Electronic Gate Passes	✓	✓	✓	✓	✓	✗
2	Electronic Bidding	✓	✓	✓	✓	✓	✓
3	Electronic Display	✓	✓	✓	✓	✓	✓
4	Exit Pass Generated	✓	✗	✓	✓	✓	✗
5	e-Agreement	✓	✓	✓	✓	✓	✓
6	Generation of Sale Receipt	✓	✓	✓	✓	✓	✓
7	Assaying Lab	✓	✓	✓	✓	✓	✓
8	Announcing Highest bid price to farmer by SMS	✓	✓	✓	✓	✓	-

9	Integration of weighment with e-NAM portal	✓	✓	×	✓	×		
10	Online Settlement	✓	×	✓	✓	✓		
11	Warehouse Integration	✓	×	×	×	✓	×	

Source: Primary Observations of Research Team during the survey

Table 4.2: Status of implemented e-NAM infrastructure in sample mandies (APMCs)

S. No.	Particulars	Haryana			Himachal Pradesh		Maharashtra	
		Charkhi Dadri	**Ellenabad**	**Karnal**	**Dhalli**	**Bandrol**	**Dound**	**Akola**
1	Electronic Gate Passes	✓	✓	✓	×	×	✓	✓
2	Electronic Bidding	✓	✓	✓	✓	✓	✓	✓
3	Electronic Display	×	✓	✓	✓	×	✓	✓
4	Exit Pass Generated	✓	✓	✓	✓	×	✓	✓
5	e-Agreement	✓	✓	✓	✓	✓	✓	✓
6	Generation of Sale Receipt	✓	✓	✓	✓	✓	✓	✓
7	Assaying Lab	✓	✓	✓	✓	✓	✓	✓
8	Announcing Highest bid price to farmer by SMS	×	✓	✓	✓	✓	✓	✓
9	Integration of weighment with e-NAM	×	×	×	✓	×	×	×
10	Online Settlement	✓	✓	✓	✓	✓	✓	✓

11	Warehouse Integration	✕		✕	✕	✕	✕	✕

Source: Primary Observations of Research Team during the survey

Table-4.2: Status of implemented e-NAM infrastructure in sample mandies (APMCs)

S. No.	**Particulars**	**Tamil Nadu**	
		Annamalai	**Perindurai**
1	Electronic Gate Passes	✓	✓
2	Electronic Bidding	✓	✓
3	Electronic Display	✕	✓
4	Exit Pass Generated	✓	✓
5	e-Agreement	✕	✕
6	Generation of Sale Receipt	✓	✓
7	Assaying Lab	✓	✓
8	Announcing Highest bid price to farmer by SMS	✓	✓
9	Integration of weighment with e-NAM portal	✕	✕
10	Online Settlement	✓	✓
11	Warehouse Integration	✕	✕

Source: Primary Observations of Research Team during the survey

Chapter -5

Stakeholders' Response

5.1 Profile of the Sample Farmers

Table-5.1 shows the status of farmers with respect to age group, education and land holding size. It shows that majority of the sample respondents ((around 64%) were having age in between 35 to 54 years. Regarding education, majority of the respondents (around 74%) are having primary and higher primary education. and this implies they enjoy sufficient education to understand the basic and functional aspects of e-NAM. With respect to land holding, majority of the sample farmers (around 53%) are having land holding less than 2 ha implying small and marginal farmers dominate the marketing of produce through e-NAM. However, around 25% of the sample respondents belong to semi-medium category with landholding size between . 2-4 hectares. Only around four per cent of the sample respondents are large farmers with land holding size more 10 hectares.

Table-5.1: Social Profile of Sample Farmers

	Particulars	No of Farmers	Percentage
Age (Years)	Below 25	12	1.95
	25 to 34	91	14.80
	35 to 44	200	32.52
	45 to 54	194	31.54
	55 to 64	85	13.82
	65 & above	33	5.37
Education	Primary	237	38.5
	Higher Primary	215	35.0
	PUC	59	9.6
	Degree	57	9.3
	Other	47	7.6
Land Holding (Ha)	Marginal (Below 1h)	124	20.16
	Small (1-2 ha)	203	33.01
	Semi-Medium (2-4hs)	155	25.2
	Medium (4-10 ha)	111	18.05
	Large (>10 ha)	22	3.58

Reasons for selling the farm produce to local commission agents and traders by the sample farmers:

The sample farmers are interviewed to elicit the reasons for selling their produce through commission agents and local traders. It is interesting that all the sample farmers prefer to sell their produce to them, as the former enjoy certain benefits like, commission agents and traders provide loans to the farmers both in terms of adequacy and in right time, there is prompt settlement of sales proceeds, provision of transport and storage facilities etc. Accordingly, the survey revealed that nearly 23 per cent of the sample farmers opined 'easy access to credit' is the major reason for selling their produce through commission agents and traders. 17 per cent of the farmers expressed that they enjoy long run association with commission agents and traders in transacting their produce and hence, they enjoy mutual trust with them. Significant number of farmers also opined 'prompt payment of sales proceeds' and 'offering reasonable prices for their produce' are also the major reasons for depending on them. These results infer that even with the advent of e-NAM facility in the mandies, there is significant influence of commission agents and traders on the farmers for transacting their produce. To counter such influence, there is a need for sensitization programs to educate the farmers about the importance and benefits of transacting their produce through e-NAM.

Table-5.2: Reason for selling the produce through specific commission agent or trader

(n = 615

S. No.	Reason	No. of Responses	Percent
1	Farmers are getting advances/Credit facility	144	22.9%
2	Trust with particular trader/CA	107	17.0%
3	Immediate cash payment	99	15.7%
4	Long term family relationships	92	14.6%
5	Better/reasonable price	91	14.4%
6	Storage Facility	41	6.5%
7	Transport facility	32	5.1%
8	Grading facility	14	2.2%
9	Input support	9	1.4%
10	Packaging material support	1	0.2%

Farmers' preferences of selling the produce Traditional market vis-à-vis e-NAM: The preferences of sample farmers regarding sale of farm produce through traditional market vis-à-vis e-NAM is analyzed through Table 5.3. It is interesting that around 54 per cent of the farmers preferred e-NAM transactions in view of multiple benefits derived through this portal. However, a significant proportion of farmers still perceive traditional market especially transactions through local commission agents and traders is followed. This is because of the reasons as mentioned earlier. Hence, it is high time that the Government has to make sincere efforts to promote awareness among the stakeholders in general and farmers in particular to popularize the benefits of transacting the farm produce through e-NAM.

Table-5.3: Preference of farmers for trade in Traditional vis-à-vis e-NAM markets

S. No.	Platform	No. of Farmers	% age
1.	Traditional	175	46.6
2.	e-NAM Platform	200	53.4
Total		**375**	**100.0**

Before that, it is felt appropriate to analyse the awareness levels among the selected sample farmers about the importance and benefits of transacting the produce through e-NAM. It is interesting that around 61 per cent of the farmers are aware about the benefits of marketing through e-NAM portal (Table 5.4). However, still 39 per cent of farmers are unaware about the meritorious aspects of the same. Hence, it is important for the State Departments of Agriculture and Agricultural Marketing to sensitize the farmers about the benefits derived through transacting the farm produce through e-NAM portal.

Table-5.4: Awareness about benefits of e-NAM transactions

S. No.	Responses	No. of Farmer	Percent
1	Un-aware	240	39.02
2	Aware	375	60.98
Total		**615**	**100.00**

The state-wise picture (Table 5.5) also showed that farmers in Gujarat, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra Tamil Nadu, Telangana and Uttrakhand enjoy awareness about the positive aspects of the e-NAM. However,

in some States like West Bengal, Uttar Pradesh, Odisha and Rajasthan, majority of the farmers are still less aware about the meritorious aspects of transacting the produce through e-NAM. This calls for conducting good number of awareness programs to the farmers by the respective State Governments duly involving State Agricultural Marketing Department or SAMBs. The personal interactions held with the sample farmers who are aware about the benefits of e-NAM portal also revealed that, around 83 per cent (Table 5.5) thoroughly understood the about the mode of transactions through e-NAM and only 17 per cent are not thorough enough with the procedures involved in transacting the produce through e-NAM. Further, it was found that less number of training or awareness camps are held at Grama Sabha (16%) level compared to mandies and this requires more attention to strengthen village level camps especially at the time of harvesting of agricultural produce (Table 5.6). It is also revealed through Figure 2 in states like Uttrakhand, Haryana, Gujarat, Rajasthan, Telangana and West Bengal, training at Gramsabha level must be intensified to promote more awareness among the farmers about the benefits of market transactions through e-NAM portal. However, in other States like Himachal Pradesh, Madhya Pradesh, Maharashtra, Tamil Nadu, Jharkhand and Odisha the farmers are receiving trainings both at mandi and gramsabha levels.

Figure-2: State wise status on awareness among farmers

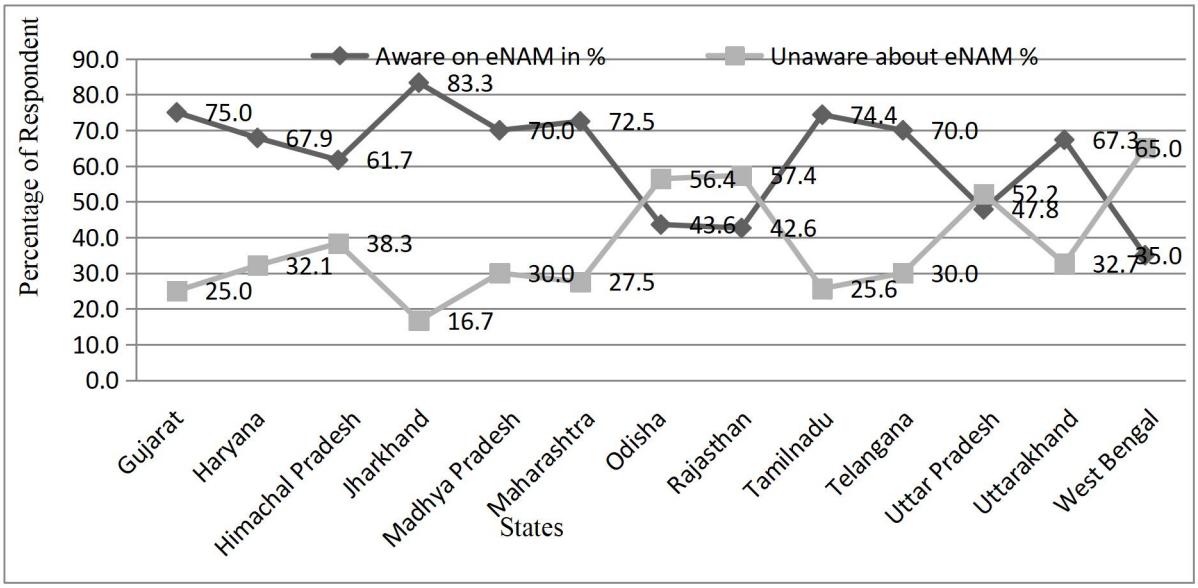


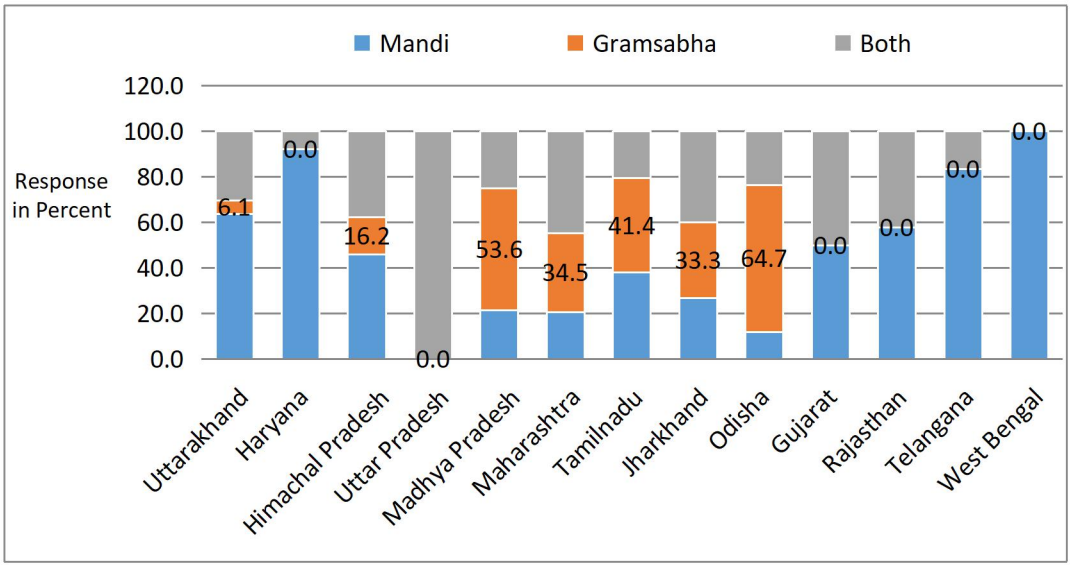
Table-5.5: Level of understanding among farmers.

S. No.	Response	No. of Farmer	Percent
1	Not understand about the concept and benefits of e-NAM	65	17.33
2	Understood about the concept and benefits of e-NAM	310	82.67
Total		**375**	**100.00**

Table-5.6: Participation of farmers in Mandi and Gramsabha training

S. No.	Level	No. of Farmers	Percent
1	Mandi	174	46.4
2	Gramsabha	61	16.3
3	Mandi and Gramsabha	140	37.3
Total		**375**	**100.00**

Figure 3. Detail of place of training



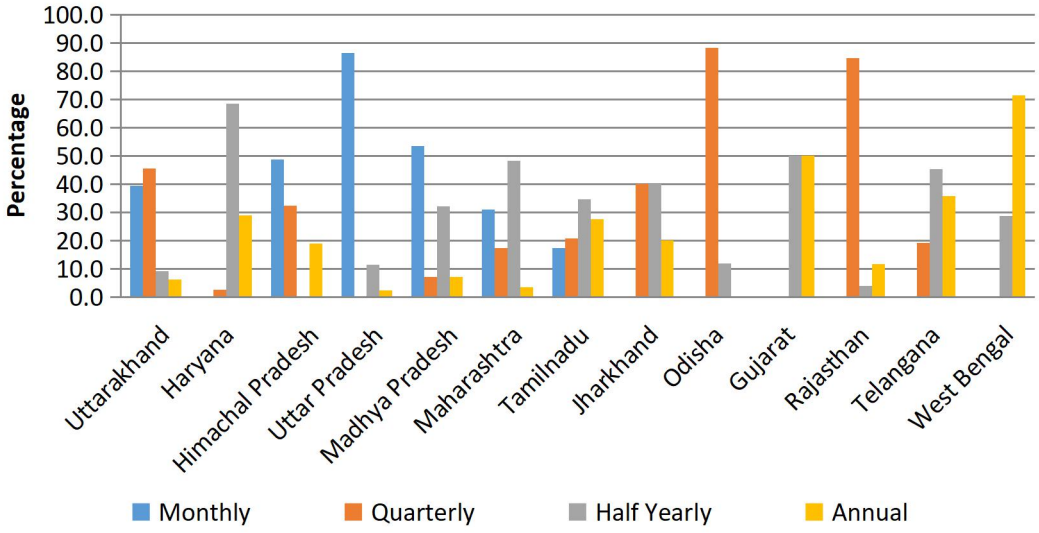
It is also important to ascertain, how frequently the trainings are conducted to the farmers about the benefits of conducting marketing transactions through e-NAM portal. Table 5.7 shows that around 30 per cent of the farmers receive trainings once in six months and around 26 per cent of the farmers received trainings once in a month. So, the frequency of trainings especially at Gramsabha level should be intensified once in a month at least to bring more awareness among the farming community. As

shown through Figure 4, in States like Himachal Pradesh, Uttar Pradesh, Madhya Pradesh and Maharashtra, the Gramsabhas are conducted in a significant number, unlike other States. However, in Uttrakhand, Odisha and Rajasthan, training are rendered once in six months. So, it urges the need for conducting more number of monthly training programs in these States for better engagement and involvement of farmers into the e-NAM system.

Table-5.7: Frequency of participation in the training

S. No.	Frequency of training	Number of farmers	%
1	Monthly	98	26.1
2	Quarterly	92	24.5
3	Half yearly	112	29.9
4	Annually	73	19.5
Total		**375**	**100.00**

Figure 4. State wise frequency of participation in selected states



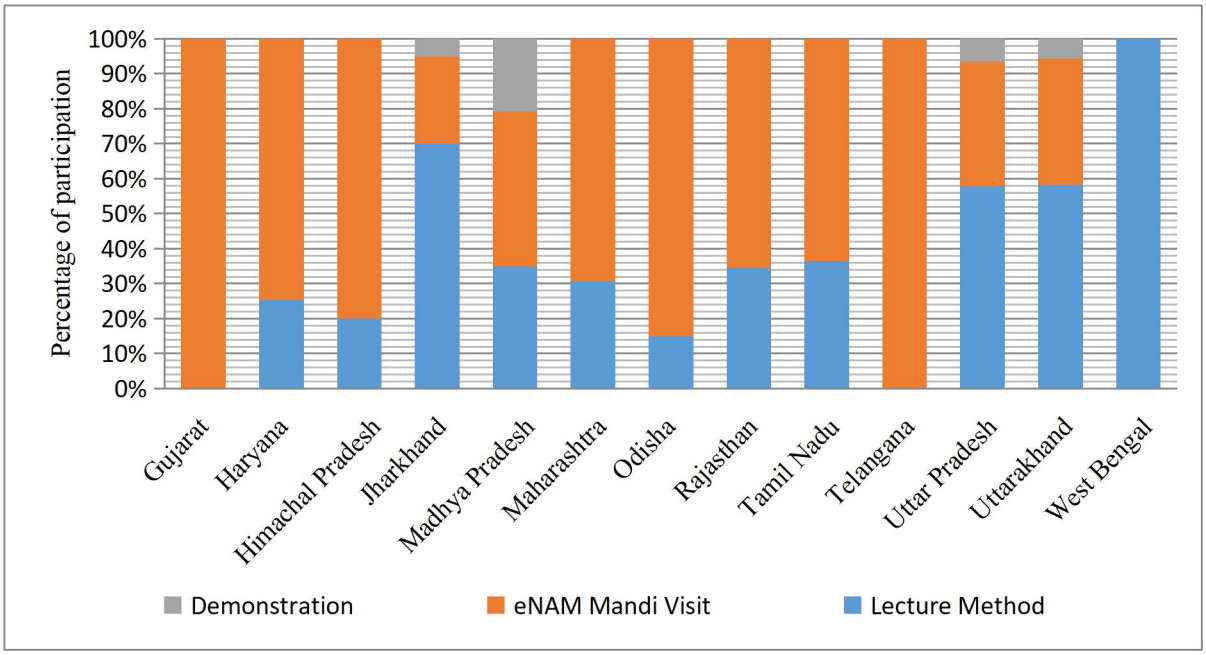
Perusal of Table 5.8 reveal that mandi visit (53%) is the major source of learning about the practical concepts of e-NAM. This is followed by lectures given by the Experts in the training programs conducted by APMC mandi and Gramsabha. However, around 4 per cent of the farmers opined showing practical demonstration in the e-NAM mandi is the best method to promote awareness among the farmers.

Table-5.8: Method of training

S. No.	Training Methods	Number of responses	% age
1	Lecture based	201	42.9%
2	e-NAM Mandi visit	250	53.4%
3	Demonstration	17	3.6%
Total		**468**	**100.00%**

The mode of training given to the farmers was also elicited across the selected States (Figure 5). It was found that, in West Bengal, the mode of training is only 'lecture' based, while in Gujarat and Telangana, the farmers are being trained only through e-NAM mandi visit only. In States like Madhya Pradesh, Jharkhand, Uttar Pradesh and Uttrakhand, the farmers have been trained through all the three modes viz., lecture, e-NAM mandi visit and demonstrations. However, though the number of demonstrations conducted are less, still the farmers opined, it is the best mode to acquaint themselves with the features and operational procedures of e-NAM portal.

Figure 5: Exposure of respondents to various training methods in selected states



Price-realization through e-NAM: It is known that one of the important objectives of introducing e-NAM portal is to ensure transparency in the auction process such that

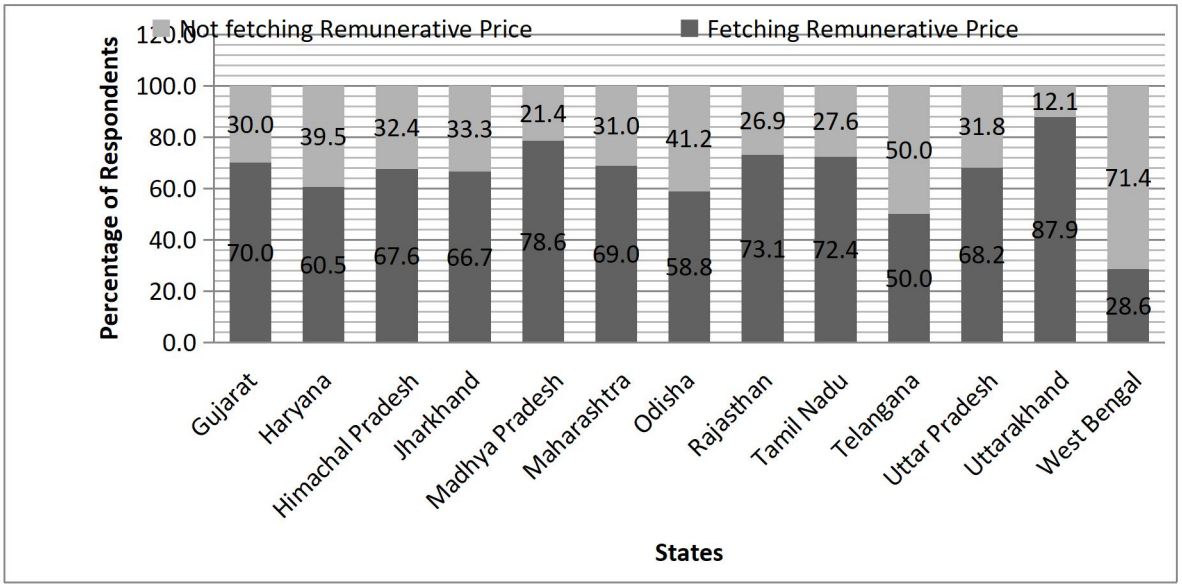
prices commensurate with quality of produce transacted by the farmers. In view of this, responses from the sample farmers are elicited regarding the remunerative prices received through e-NAM portal. The findings through Table 5.9 revealed that around 68% of the respondents are satisfied in getting remunerative prices for their produce transacted through e-NAM. Though, 32 per cent of the farmers informed about not getting remunerative prices and this may be due to coincidence of market sales at times of bumper harvest of produce.

Table-5.9: Response of farmers over realizing remunerative price through e-NAM

S. No.	Price realization through e-NAM portal	No. of Farmers	% to Total
1	Not Satisfied	119	31.7
2	Satisfied	256	68.3
Total		**375**	**100.0**

The information pertaining to Table 5.9 was collected across the selected States and it is heartening to note that, across majority of the States (except Telangana and West Bengal), the farmers expressed satisfaction in realizing remunerative prices for their produce transacted through e-NAM. This is marking a signal of widened spectrum of e-NAM with respect to better price discovery in the mandies.

Figure-6: Percentage of respondents with respect to realization of remunerative prices for their produce.



From the above Table 5.9, it is evident that around 68 per cent of the farmers expressed their satisfaction in getting remunerative prices for their produce transacted through e-NAM portal across the selected States. It is felt appropriate to know from the sample farmers, to what extent there is increment in market price of produce transacted through e-NAM compared to open market and the findings are shown through Table 5.10. It is interesting that around 41 per cent of the farmers are realizing higher prices for their produce to the tune of more than 10 per cent higher than the market price realized in the physical market. On the whole, all the farmers expressed that they are realizing higher market prices through e-NAM compared to physical market. Of course, the extent of price realization for the produce in the market depends upon the domestic demand and supply factors influenced by domestic price policy. But, certainly the transaction of produce through e-NAM is fetching higher prices to the farmers compared to the physical market.

Table-5.10: Price increment of produce transacted through e-NAM vis-à-vis Physical market

S. No.	Percentage increase in price	No. of Farmers	% to total
1	Less than 10%	150	58.6
2	10-20%	89	34.8
3	20-30%	7	2.7

S. No.	Percentage increase in price	No. of Farmers	% to total
4	30-40%	9	3.5
5	40-50%	10	3.9
6	More than 50%	0	0
Total		**256**	**100.00**

5.2 Benefits from e-NAM transactions:

On looking at the advantages of e-NAM (Table 5.11), 26 per cent of the sample farmers from across the selected states reported better price discovery, improved facilities regarding transparent procedures weighment, bidding (24%), and improved assaying facilities (17%). All the farmers expressed that they have realized the benefits of e-NAM in one form or the other through enjoying better facilities for knowing quality of product, satisfaction of being part of the national market, higher traded volume and prompt payment of sales proceeds. They further opined that though they worked with commission agents earlier in regulated markets, now are able to go for online bidding. Further, as awareness increases, they will be more confident of bidding online on their own.

Table-5.11: Farmers response on the benefits of e-NAM

N=375

S. No.	Benefits	No. of Responses	% age	Rank
1	Time saving	75	7.3	6th
2	Better Price Discovery	266	26.0	1st
3	Transparency Weighing, Biding etc.	243	23.8	2nd
4	Payment System is good	146	14.3	4th
5	Quality Testing facility i.e. Assaying	172	16.8	3rd
6	Bidding prices are based on quality of produce	121	11.8	5th

5.3 Challenges faced by farmers in transacting the produce through e-NAM:

In spite of the meritorious features expressed by the sample farmers, they further posed the challenges (Table 5.12) for betterment of e-NAM in the coming future. They considered delay in payment, lack of adequate facilities and staff for grading and assaying, complexities involved in understanding the transaction process

through e-NAM, poor access to better technology etc., are the prioritized issues in e-NAM transactions. This implies the challenges are more or less related to technology usage and this calls for capacity building for imparting skill based training programmers to the farmers.

Table-5.12: Challenges faced by the farmers in adoption of e-NAM

S. No.	Items	No. of Responses	% age
1	Delay in Payment	192	22.0
2	Grading and assaying	158	18.1
3	Complexities involved in the process	154	17.6
4	Not well versed in technology	128	14.7
5	Delay in dispute settlement	104	11.9
6	Limited numbers of commodities covered under e-NAM	69	7.9
7	Difficulty while handling mobile application	68	7.8

Farmers can register themselves for selling the produce through e-NAM in three ways viz., *via* e-NAM Portal- http://www.enam.gov.in, through Mobile Application and through Mandi Registration (At Gate Entry). It is advisable for the farmers to use smart phones with internet connectivity to get updates from markets and would be able to auction their produce from their villages. It will certainly weed out unscrupulous traders and middlemen. Accordingly, the access of sample farmers regarding use of smart phones was surveyed and it was found that around 67 per cent of them have access to smart phone (Table 5.13) and rest of the farmers are registering through Mandi Registration (At Gate Entry). Further, it was observed that only 36 per cent of the respondents are accessing e-NAM through smart phone (Table 5.14). Across the selected States, the use of smart phones for accessing e-NAM portal is quite popular in few States like Maharashtra, Himachal Pradesh, Telangana, Rajasthan, Uttar Pradesh and Uttrakhand (Figure 7). In other states, especially in West Bengal, there is remote access of e-NAM portal from smart phones. So, there is still a long

way to go and the onus is on State Governments to let farmers get benefits from their own smart phones and to check the dependency of farmers on traders.

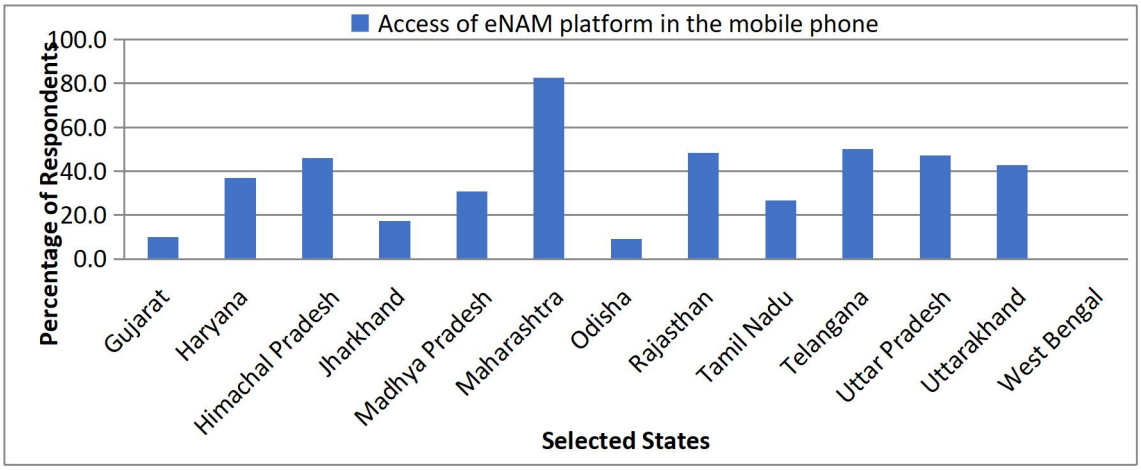
Table-5.13: Smartphone access to farmer

S. No.	Type	No. of Farmers	% age
1	Smart phone (Android/windows)	251	66.9
2	Simple mobile	124	33.1
Total		**375**	**100.00**

Table-5.14: Access of e-NAM application in mobile phone

S. No.	Access of e-NAM application in mobile	No. of Farmers	% age
1	Do not access e-NAM app in mobile	240	64
2	Access e-NAM app in mobile	135	36
Total		**375**	**100.00**

Figure-7: Access of e-NAM platform in the mobile phone



5.4 Responses of FPOs

FPOs can register on e-NAM Portal via website (www.enam.gov.in) or mobile app or providing following details at nearest e-NAM mandi viz., Name of FPO, Name, address, email Id and contact no. of authorized person and Bank account Details (Name of Bank, Branch, Account no. IFSC Code). Government of India is pushing the States to allow FPOs to trade from their premises through the e-NAM platform, so that farmers get directly connected to traders and processors from across the country.

This is one of the significant reforms in agricultural marketing to enable the farmers enjoy the benefits of transacting large scale marketable surplus. In this study, 56 Farmer Producer Organizations across 14 states namely Andhra Pradesh, Chhattisgarh, Gujarat, Haryana, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, Uttrakhand and West Bengal are analysed with respect to the extent of their participation in transacting agricultural produce through e-NAM portal. Among the selected FPOs, *Bhumgadi Mahila Krushak Producer Co. Ltd* of Chhattisgarh is the largest comprising of 5278 members and Nayi Kranti SRC of Uttrakhand is the smallest one comprising of only 14 members. The informal discussions held with the farmer-members and officials of FPOs revealed that nearly three fourth of the FPOs are having more than 200 hectares of land (Table 5.15). Majority of the FPOs are in nascent stage and new to the business environment of transacting the produce through e-NAM portal. Findings through Table 5.16 revealed that nearly 86 per cent of the selected FPOs are having less than 5 years of establishment.

Table-5.15: Landholding of FPOs in Hectares

S. No.	Landholdings in Ha.	No. of respondents	% to total
1	Up to 200	15	26.79
2	201 to 400	10	17.86
3	401 to 600	7	12.50
4	601 to 800	3	5.36
5	>801	21	37.50
Total		**56**	**100.00**

Table-5.16: Establishment of FPOs

S. No.	Year	No. of Respondents	% age
1	below 2 years	10	17.86

2	2 to 5 Years	38	67.86
3	6 and above	8	14.29
Total		**56**	**100.00**

It is found interesting that around 79 per cent of the FPOs (Table 5.17) are in favour of having aggregation platform to transact large scale marketable surplus for better price realization and drastic reduction in transaction costs. This is so because, aggregation of produce not only benefits the FPOs in realizing higher market prices, but also in sharing the farmer-members production and marketing problems towards better outcomes. However, the desired results from linking the FPOs to e-NAM mandies are far from the expectations, as they do not enjoy special platforms or premises in the APMC mandies for placing the bulky produce, as opined by majority of the FPOs (73%) across the States (Table 5.18). Though majority of the FPOs are in the nascent stage (less than 5 years from establishment), they are well-versed with the benefits due to e-NAM portal With the introduction of FPO trading module in e-NAM by the Government, now the FPOs can trade their produce directly from their collection centre without bringing the produce to APMC. The same is expressed by around 84 per cent of the respondents (Table 5.19). Though 16% of the FPOs are still not clear about the e-NAM concept, it can be addressed through better handholding of the FPOs in the market front (Table 5.20).

Table-5.17: Common platform for the aggregation

S. No.	Response	No. of Respondents	% age
1	No	12	21.4
2	Yes	44	78.6
Total		**56**	**100.0**

Table-5.18 Facilities in the APMC market premises

S. No.	Response	No. of Respondents	% age
1	No	41	73.2
2	Yes	15	26.8
Total		**56**	**100.0**

Table-5.19: Awareness about e-NAM

S. No.	Parameter	No. of Respondents	% age
1	Un Aware	9	16.10
2	Aware	47	83.90
Total		**56**	**100.0**

Table-5.20: Clarity on concept and benefits of e-NAM

S. No.	Parameter	No. of Respondents	% age
1	Not Understand	5	10.64
2	Understand	42	89.36
Total		**47**	**100.00**

In view of the potential benefits derived through e-NAM portal in terms of price realization and decline in transaction costs, around 64 per cent of the selected FPO respondents opined e-NAM transactions are better compared physical transactions in mandi (Table-5.21). Accordingly, majority of the respondents (55%) opined better price realization through the e-NAM mandi (Table 5.22). However, significant number of respondents (45%) are not satisfied with the price realization through e-NAM. So, it is high time that the respective State Governments should address this issue through imparting trainings to the farmers on the operational modalities of e-NAM portal. This is because, one of the important components of e-NAM is change management. This comprises of behavioral, operational and administrative changes. These changes are desirable and essential to enable adoption of e-NAM processes as a daily practice. Since e-NAM is a digital platform and serves varied stakeholders, training and awareness sessions assume greater importance. This will enable all the stakeholders to operate on the e-NAM for their business requirement.

Table-5.21: FPOs perception on tradition and e-NAM mandi

S. No.	Parameter	No. of respondents	% age
1	Tradition mandi is better	17	36.17
2	e-NAM mandi is better	30	63.83
Total		**47**	**100.00**

Table-5.22: FPOs perception on price in e-NAM mandi

S. No.	Parameter	No. of Respondents	% age
1	Not getting better price	21	44.68
2	Getting Better price	26	55.32
Total		**47**	**100.00**

Accordingly, the number of FPO members trained on e-NAM portal was studied and the findings showed that only 45 per cent of the members have received trainings (Table 5.23). These trainings are conducted at the APMC premises across all the selected States. However, nearly 47 per cent of the farmer-members of selected FPOs are not trained on operational modalities of FPOs. This shows that there is an acute need for conducting good number of training programs to acquaint the members of FPOs on e-NAM process and its benefits. The trainings should focus on imparting knowledge and skills around the business activities (across products and services) that FPOs are currently undertaking and the transaction of produce through e-NAM portal that ensure benefits to its members and creating profits to sustain its operations.

Table-5.23: Views of FPOs on Training on e-NAM trade

S. No.	Parameter	No. of Respondents	% age
1	Not Participated in training	22	46.80
2	Participated in training	21	44.68
3	Not responded	2	4.2
Total		**47**	**100.00**

For the respondents who received trainings, are interviewed for their frequency of participation. Around 48 per cent of the FPO members (Table 5.24) received training once in a year followed by once in a quarter-year (24%). Further, 57 per cent of the farmers have not received any training programme with regard to operation of e-NAM through mobile (Table 5.25). So, the frequency of the trainings should be increased at least on quarterly basis to cover more number of members and to realize the true benefits of e-NAM. Looking at the familiarity of usage of smart phones

(around 83%) by the farmer-members of FPOs (Table 5.26), it is strongly recommended to conduct trainings to use e-NAM portal through mobile phones for better reach and increasing participation in e-NAM transactions.

. **Table-5.24: Frequency of participation in training programme**

S. No.	Frequency of the training	No. of Respondents	% age
1	Monthly	1	4.8%
2	Quarterly	5	23.8%
3	Half yearly	4	19.0%
4	Annually	10	47.6%
5	Not responded	1	4.8%
Total		**21**	**100.00**

Table-5.25: Training on mobile application

S. No.	Parameter	No. of Respondents	% age
1	Not received	12	57.1%
2	Received a training on mobile app	8	38.1%
3	Not Responded	1	4.8%
Total		**21**	**100.0**

Table-5.26: Type of mobile phone using by FPOs

S. No.	Parameter	No. of Respondents	% age
1	Simple Mobile	8	17.02
2	Android	37	78.72
3	IOS (Apple)	2	4.26
Total		**47**	**100.0**

5.5 Challenges faced by FPOs in adoption of e-NAM:

Like individual farmers, even the FPOs are facing good number of challenges in adopting e-NAM platform. Because of less number of trainings, even after four years of implementation, around 34% of farmer-members in FPOs are less aware about e-NAM process (Table 5.27). Most of the respondents are facing significant

challenges relating to infrastructure and payment issues. All these aspects should be taken care off at the APMC mandi level through proper utilization of the given funds and resources.

Table-5.27: Challenges faced by the farmer-members in adoption of e-NAM

S. No.	Items	No. of Responses	% age
1	Not fully aware about e-NAM Process	19	33.9
2	No storage facility at mandi level	5	8.9
3	No Transport facility at mandi level	5	8.9
4	No proper grading facility	3	5.4
5	Time Consuming	2	3.6
6	Payment related issues	5	8.9
7	Infrastructure	1	1.8
8	Depend on commission agents	1	1.8
9	Not Responded	15	26.8

Suggestions from the FPO members: The informal discussions held with the FPO members revealed the following interesting points:

- The Government should ensure that farmers adopt this e-NAM mechanism and do away with their traditional interactions with the traders.
- Startups should be allowed to test the quality of the produce at nominal fee basis.
- The Government should also ensure the development of a network of cost-effective assaying facilities in APMC mandies across the selected states for all the commodities.
- The e-NAM mechanism should include state-of-the-art technologies to enable quick and accurate assaying at a reasonable cost. Assaying should be made mandatory for transactions under e-NAM.
- It is necessary to ensure that e-NAM/APMC markets have appropriate storage facilities to provide cost-effective warehousing facilities to

farmers to avert distress sale. Private players can be invited to build more warehouses at the site of mandies.

- Electronic payments should be adopted so that farmers get prompt payment from their produce.
- Auction of the produce should take place simultaneously on one common electronic platform in all APMC markets in the country, as well as in the private market.
- There should be a regular flow of information on prices and trades executed on e-NAM so that integration of the market is achieved.
- In order to ensure that the buyers from across the country, irrespective of the location, can buy produce from any part of the country, necessary agri-logistics infrastructure for storage, testing and transportation should be put in place.
- Capacity building of FPO members especially on the use of e-NAM mobile app is essential, as most of the members are using smart phones. Hence, the APMC mandies should take the responsibility in conducting such good number of training programs.

5.6 Responses of Commission Agents:

Table- 5.28: State wise commission agents interacted

S. No.	States	Districts Covered	Mandies Covered	Agents interacted with
1	Gujarat	1	1	5
2	Haryana	3	3	15
3	Himachal Pradesh	3	3	15
4	Maharashtra	2	2	10
5	Rajasthan	3	3	15
6	Tamil Nadu	1	1	5

7	Telangana	3	3	15
8	Uttar Pradesh	3	3	15
9	Uttrakhand	2	3	10
10	West Bengal	1	1	5
Total		**22**	**22**	**110**

Awareness of Commission Agent on e-NAM: It is felt that with the execution of e-NAM project, more resistance will be offered by the commission agents in the markets. However, the findings of the study revealed around 94 per cent of the commission agents are completely aware about e-NAM (Table 5.29) and this highlights the popularity of this project.

Table-5.29: Awareness about e-NAM

		Frequency	% age	Valid % age	Cumulative % age
Awareness about e-NAM	No	7	6.4	6.4	6.4
	Yes	103	93.6	93.6	100.0
	Total	**110**	**100.0**	**100.0**	

In the selected markets, around 73 per cent of the respondents are below 50 years of age (Table 5.30). The youngsters below 35 years of age are fully aware about the e-NAM e scheme. On the whole, around 94 per cent of total respondents are aware of this scheme and its benefits.

Table-5.30: Crosstab: Age Group v/s Awareness on e-NAM

		Awareness on e-NAM				Total
		No	Percentage	Yes	% age	
Age Group	Less than 35 Years	0	0	22	100	22
	36-50 Years	4	7%	54	93%	58
	51-65 Years	2	7%	26	93%	28
	66 years and above	1	50%	1	50%	2
Total		**7**		**103**		**110**

The insights on the preference of e-NAM over traditional platform was also surveyed and the findings revealed that 47% of the respondents were preferring e-NAM over traditional marketing channel (Table 5.31). However, majority of the respondents (53%) are preferring traditional market to e-NAM. Further, with increasing in age of the respondents, the preference towards traditional market is increasing. This implies that age old people want to stick to the traditional market and are quite reluctant to the e-NAM system. However, the survey indicated that there is slow and gradual acceptance of respondents towards e-NAM. . It is also found interesting that, the farmers are still depending upon the commission agents (Table 5.32) even with the advent of e-NAM system because the latter meet the financial needs of the farmers right from plough share point and till the crop is harvested.

Table-5.31: Crosstab: Age Group v/s Preference (traditional platform or e-NAM)

Parameter		**Preference**				**Total**
		Traditional	**% age**	**e-NAM**	**Percentage**	
Age Group	Less than 35 Years	9	40%	13	60%	22
	36-50 Years	36	62%	22	38%	58
	51-65 Years	17	61%	11	39%	28
	66 years and above	2	100%	0	0%	2
Total		**58**	**53%**	**52**	**47%**	**110**

Table-5.32: Crosstab: Age Group vs Dependency of Farmers

		Do the farmer depend on commission agents for trade through e-NAM				**Total**
		No	**% age**	**Yes**	**% age**	
Age Group	Less than 35 Years	7	32%	15	68%	22

	36-50 Years	29	50%	29	50%	58
	51-65 Years	8	29%	20	71%	28
	66 years and above	0	0%	2	100%	2
Total		**44**	**40%**	**66**	**60%**	**110**

Impact of training on awareness*:* It is heartening that majority of the respondents (72%) have participated in the training programs and are aware about e-NAM operational procedures. This indirectly benefits the farmers that are dependent on commission agents in transacting the produce through e-NAM. Accordingly, realizing the benefits of e-NAM, the farmers are also preferring those commission agents, who are well versed with its operational modalities. This is shown through Table 5.34, where 54 per cent of the trained commission agents are preferred by the farmers in transacting the produce through e-NAM. These results highlight the importance of capacity building programs in enhancing the stakeholders participation in e-NAM transactions.

Table-5.33: Crosstab: Relationship between training and awareness

		Awareness about e-NAM				**Total**
		No	**%e**	**Yes**	**%**	
Training Participation	No	7	23%	24	77%	31
	Yes	0	0%	79	100%	79
Total		**7**	**6%**	**103**	**94%**	**110**

Table-5.34: Crosstab: Impact of training on Preference of commission agent

		Preference				**Total**
		Traditional	**Percentage**	**e-NAM**	**% age**	
Training Participation	No	22	71%	9	29%	31
	Yes	36	46%	43	54%	79

Total	**58**	**53%**	**52**	**47%**	**110**

Involvement of Commission Agent on Trade on e-NAM: Table 5.35 depicts the role of commission agent in the trade facilitation of various commodities through e-NAM vis-a-vis non-e-NAM platforms. It is interesting that, after imparting good number of training programs, the commission agents are handling almost all major commodities through e-NAM. Of course, though the volume of transactions are less compared top physical market, this is a welcome move across all the states.

Table-5.35: Facilitation by commission agent in various commodities

Sl. No	State	Facilitate Commodity Trading on e-NAM	Facilitate Commodity Trading on Non-e-NAM
1	Gujarat	Soybean, Paddy, Wheat, Maize	Soybean, Paddy, Maize,
2	Haryana	Paddy, wheat, Mustard, Maize, Bajra, Onion	Paddy, Wheat, Mustard, Basmati, Til, Cotton and
3	Himachal Pradesh	Tomato, Peas, Garlic, Apple, Pomegranate, Cauliflower and	Plum, Apricot, Ginger, Maize, Cabbage, Pear and
4	Maharashtr	Wheat, Maize, Bajra, Gram,	Onion, Lentil, Soybean,
5	Rajasthan	Moth, Groundnut, Cumin, Guar, Isabagol, Fenugreek, Cotton, Wheat, Bajra, Mustard	Moth, Groundnut, Cumin, Bajra, Mustard
6	Tamil	Copra	Copra, Paddy
7	Telangana	Paddy, Groundnut, Red gram,	Vegetables, Castor
8	Uttar Pradesh	Wheat, Paddy, potato, Radish, Capsicum, Cauliflower and	Paddy, Wheat, Vegetables, Brinjals and Onions
9	Uttrakhand	Wheat, Maize, Barley, Arhar, Bajra, Rajma, Tomato, Small	Paddy, Tomato and Wheat
10	West	Paddy, Till, Groundnut and	Paddy, Till and Pulses

The preferential views of commission agents regarding non-e-NAM vis-à-vis e-NAM transactions was inquired and the findings revealed the following interesting points:

- Some of the commission agents preferred the traditional method (Table 5.36) because, it is comparatively easier without any IT related issues. They further opined that, farmers are still preferring this method, as they depend on them for financial requirements. This method also ensure price discovery through auction process under the supervision of mandi officials. On the other hand,
- Some of the commission agents responded positively towards the implementation of e-NAM (Table 5.37)on the grounds of transparency, better price realization, easy process, time saving, improved assaying facilities etc.

Table-5.36: Reasons for using traditional method for trading

S. No.	Responses	Frequency	% age
1	Easy process	38	43%
2	Easy payment realization	16	18%
3	Better price	10	11%
4	trustworthy relations	8	9%
5	time saving	8	9%
6	Assaying	5	6%
7	unawareness	2	2%
8	Credit benefit	1	1%

Table-5.37: Reasons for using e-NAM platform

S. No.	Responses	Frequency	% age
1	Transparency	18	23%
2	Better price realization	17	22%
3	Easy to use	15	19%
4	Time saving	15	19%
5	Bank payment	5	6%
6	Assaying facility	4	5%
7	Farmer friendly	2	3%
8	Queue Management	1	1%

Perception of Commission agents on Difficulties in e-NAM: However, the commission agents opined that few constraints in the APMC mandies regarding cash payment issues, poor internet connectivity, time consuming procedure, poor operational knowledge are to be addressed on war-footing basis to realize the true benefits of e-NAM. They are also of the opinion that the decision of crediting money into the bank accounts of farmers adversely impacts the arhatiya system. This is because, they lend huge amounts to the farmers before the sowing season. If payments are transferred directly into the farmers' accounts, then there is no guarantee that they will get the money back.

Table-5.38: Difficulties in the e-NAM operations

S. No.	Responses	Frequency	% age
1	Difficulty in cash payment	18	24%
2	Internet connectivity issue	17	23%
3	Procedure is time consuming	15	20%
4	Lack of proper operational knowledge	15	20%
5	Security issue in interstate trading	5	7%
6	Farmers are not ready to trade on e-NAM	4	5%

The multi-faceted roles played by the Commission Agents in the APMC mandies across the selected States (Table 5.39) revealed that they are the critical functionary in moving the produce from the farmers to the Wholesalers or Processors in the supply chains of commodities. Except for Gujarat, in all other selected states, trade facilitation is being done by commission agents either in all the services or partially.

Table-5.39: Facilities provided to farmers by Commission Agents

States	Transportation for commodity	Loading/Unloading	Cleaning/ Grading	Weighing/ Packaging	Lifting of samples for Assaying

States	Transportation for commodity	Loading/Unloading	Cleaning/ Grading	Weighing/ Packaging	Lifting of samples for Assaying
Gujarat	✕	✕	✕	✕	✕
Haryana	✓	✓	✓	✓	✓
Himachal Pradesh	✓	✓	✓	✓	✕
Maharashtra	✕	✓	✓	✕	✕
Rajasthan	✓	✓	✓	✓	✓
Tamil Nadu	✕	✓	✓	✓	✕
Telangana	✕	✓	✓	✓	✕
Uttar Pradesh	✕	✓	✓	✕	✓
Uttrakhand	✓	✓	✕	✓	✓
West Bengal	✓	✓	✓	✓	✓

In view of the crucial roles played by the commission agents in facilitating the marketing transactions in APMC mandies and their increasing role in facilitating e-NAM transactions, their opinions were elicited for further betterment of functioning of e-NAM system. They opined that assaying of produce, capacity building, prompt payment of sales proceeds, internet connectivity etc., should be addressed on priority basis.

Table-5.40: suggestions listed by commission agents for further improvement

S. No	Suggestions
1	Assaying should be emphasized more
2	Training should be provided
3	Bank Transactions for payment should be on the same day
4	Internet Connectivity is the biggest issue for using the portal
5	A weighing balance should be installed commonly

6	Awareness programs should be implemented for e-NAM
7	There should be facility for Quality Check of the commodity
8	e-NAM marketing and advertisement should be done
9	Assaying and Grading facility for perishable commodities

5.7 Responses of Traders

Awareness on e-NAM among Traders: In order to understand the insights of traders, 163 traders of selected states were interviewed. It was found that 93% of the farmers are well aware about the e-NAM operational modalities (Table 5.41). Further, 93 per cent of the traders above 21 years age group are more aware about e-NAM (Table 5.42)

Table-5.41. State wise description of awareness among traders towards e-NAM

S. No.	State	Not Aware	Aware	Total
1	Andhra Pradesh	0	5	5
2	Gujarat	0	10	10
3	Haryana	2	13	15
4	Himachal Pradesh	0	15	15
5	Jharkhand	0	4	4
6	Madhya Pradesh	0	10	10
7	Maharashtra	0	5	5
8	Maharashtra	0	5	5
9	Odisha	2	18	20
10	Rajasthan	0	15	15
11	Tamil Nadu	1	8	9
12	Telangana	0	10	10
13	Uttar Pradesh	5	15	20
14	Uttrakhand	0	15	15
15	West Bengal	2	3	5
	Total	**12**	**151**	**163**

Source: Primary Survey 2020

Table-5.42. Age of respondents vs. Awareness on e-NAM

S. No.	Age of Respondents	Frequency Percentage	Aware on e-NAM	Unaware about e-NAM
1	Less than 20 years	0	0	0
2	21-35 years	32	31	1
3	36-50 Years	84	77	7
4	51-65 Years	43	40	3

5	66 and Above	4	3	1
Total		**163**	**151**	**12**

Source: Primary Survey 2020

Awareness level among traders was further investigated with respect to trainings received on e-NAM and the findings revealed that 85 per cent of the selected traders have received training (Table 5.43). It is important that 15 per cent of the respondents have not received any training programme and thus, they are preferring only traditional mandi transactions. So, it is high time to conduct good number of training programs on the operational modalities of e-NAM portal.

Table 5.43: Impact of Training on e-NAM among traders

		Training on e-NAM		Total
		No	Yes	
e-NAM Awareness	Not Aware	5	7	12
	Aware	20	131	151
Total		**25 (15.33%)**	**138 (84.66%)**	**163**

Source: Primary Survey 2020

It is interesting to elicit the responses from traders regarding the commodities dealt with after the implementation of e-NAM in APMC mandies. The survey revealed that, majority of the traders are dealing with cereals like wheat, paddy and maize (Table 5.44). In addition, soyabean, bajra and mustard are also dealt. Compared to fruits and vegetables, these commodities are relatively semi-durable and hence, these commodities are predominantly transacted through e-NAM in the mandies. The informal discussions held with the sample respondents also revealed that, among fresh fruits, 'apple' is being traded in sufficiently large quantities. However, lack of adequate cold storage facilities is hampering their trade in the mandies on large-scale.

Table-5.44: Major Commodities traded on e-NAM by sample respondents

S. No.	Major commodities traded on e-NAM	Frequency	Rank
1	Wheat	51	1
2	Paddy	42	2
3	Maize	37	3

4	Soybean	25	4
5	Bajra	25	4
6	Mustard	17	5

Source: Primary Survey 2020

As discussed earlier, commission agents and traders play vital role in protecting the interests of the farmers. Especially traders, who enjoy verbal agreement with the farmers will provide transport facility, warehouse/storage facility, loading and unloading facilities, provide requisite inputs like fertilizers, pesticides, credit etc. Hence, farmers prefer to sell their produce to the traders in the APMC mandies. In view of their importance, responses were elicited regarding the facilities extended by them to the farmers in e-NAM mandies (Table 5.45). It was found that only 46% farmers are getting storage facilities from traders, only 29.4 % farmers are getting facilities of cleaning grading and only 28.8% farmers are availing transportation facilities offered by the traders. However, the dependency of farmers on traders is found significant with reference to loading and unloading facilities (65%). So, mechanizing the operations in the mandies deserve special attention to reduce the dependency of farmers on traders. Accordingly, the survey further revealed that, majority of the traders are expecting the APMC officials to strengthen loading and unloading facilities, storage and packaging and packing facilities (Table 5.46). Through provision of transportation facility is not the statutory responsibility of the APMCs, in view of its crucial significance in minimizing the transaction costs, it should be extended at least to the farmers from remote villages. Provision of these facilities suggested by the traders will be helpful for further promotion of e-NAM in the selected mandies.

Table-5.45: Facilities provided by traders to farmers

S. No.	Facilities	Yes	No	Not Responded	Total
1	Storage facility	75 (46%)	83(50.9%)	5 (3.1%)	163
2	Loading/unloading	106 (65%)	57(35%)	0 (0%)	163

	facility				
3	Cleaning grading	48(29.4%)	68(41.7%)	47(28.8%)	163
4	Transport facility	47(28.8%)	69(42.3%)	47(28.8%)	163

Source: Primary Survey 2020

Table-5.46: Facilities expected by Traders from APMC Market

S. No.	Facilities expected in mandi	Frequency
1	Loading/Unloading	108
2	Transportation	106
3	Storage	67
4	Packaging	45
5	Any other	25

Source: Primary Survey 2020

Trader's Interest on e-NAM: In general, traders often prefer and trust visual inspection by their own agents rather than on e-NAM. Further, settlement of trade with immediate online payments is also an intrinsic part of e-NAM. However, with improving assaying and grading facilities, storage facilities, warehousing trading module, FPO trading module etc., now the traders are willing to take up the market risks to sell and purchase the produce through online. Further, with the improvement in clarity on dispute settlement mechanism, now the traders are showing optimism towards online trading. Accordingly, the survey revealed that 52 per cent of traders are preferring e-NAM trade to physical trade in mandies (Table 5.47) and this is really an encouraging signal for the promotion of e-NAM in APMC mandies. However, traders (55%) are of the opinion that, there is still a long way to go to further improve assaying and grading facilities in the APMC mandies. This is because, in the mandies there are no scientific sorting/grading facilities or quality testing machines (Table 5.48). When a produce is not assayed or graded, traders from another region or centre will be reluctant to trade. So, a trader has to be guaranteed for the quality of the produce he/she buys. In the absence of such a guarantee, e-NAM will definitely fail to attract traders from across the country. Another important constraint is lack of personnel to assay and grade farm produce. Some selected APMC mandies have procured the equipment and are ready to put up a laboratory to test and grade farm

produce. But, no personnel have been recruited yet for carrying out the quality tests of the produce.

Table-5.47: Traders preferable mode of trade

S. No.	Parameter	Frequency	Percent	Cumulative % age
1	Traditional Platform	78	47.9	47.9
2	e-NAM Platform	85	52.1	100.0
Total		**163**	**100.0**	

Source: Primary Survey 2020

Table 5.48: Improvement in Quality parameters

Particulars	Does Improvement is required in quality parameters?		
Response	Yes	No	NR
Frequency	68 (41.7%)	90 (55.2%)	5

Source: Primary Survey 2020

Traders' Perceptions on Price realization through e-NAM: Traders insights were captured with respect to realization of better price of commodity in e-NAM platform. Table 5.49 reveals that majority of traders do not found e-NAM as a better price realization platform. However, a significant proportion of respondents (44.8%) shared a positive response towards better price realization. Of course, price realization for produce often commensurate with the quality and grades of produce transacted in the APMC mandies. When the assaying and grading facilities are improved, e-NAM benefits both the farmers and traders in realizing remunerative prices. Further, majority of the traders opined respondents they enjoy inter-mandi license in a state, unlike inter-state license (Table 5.50). So, in order to develop a competitive marketing system on a PAN-India basis, it is high time to liberalize the licensing procedure for traders.

Table 5.49: Responses of traders on increasing price of commodity traded in e-NAM

S. No.	Price realization	Frequency	% age	Cumulative % age
1	Not Increased	86	52.8	52.8
2	Yes Increased	73	44.8	55.2
3	No Response	4	2.5	100.0
Total		**163**	**100.0**	

Source: Primary Survey 2020

Table 5.50: Responses of Inter Mandi License and Inter State License

	Inter Mandi License	Inter State License
No	46 (28.2%)	144 (88.3%)
Yes	116 (71.2%)	18 (11%)
No Response	1 (0.6%)	1 (.6%)
Total	**163 (100%)**	**163 (100%)**

Source: Primary Survey 2020

Reasons for trading the produce through e-NAM

Traders were asked to prioritize the reasons for trading of commodities in APMC mandies having e-NAM facility (Table 5.51). They ranked transparency in trade, convenience, time saving procedures, better price realization compared to physical market etc., are the prioritized reasons. However, assaying, which is assumed to be backbone of the e-NAM market did not get significant response from traders. This calls for strengthening of grading and assaying facilities in the e-NAM mandies to realize the true benefits of online trade. Trader's further opined that complex e-Payment realization, complex Grading and Assaying, lack of proper understanding about e-NAM concept should deserve special attention (Table 5.52).

Table-5.51: Reasons for trading of commodity on e-NAM

S. No.	Reasons	Frequency	Rank
1	Time saving	93	3
2	Convenience	107	2
3	Transparent in trade	108	1

4	Better Price	90	4
5	Payment through bank	69	5
6	Quality assurance due to assaying	59	7
7	Weighing	61	6
8	Queue management at the gate	45	8

Source: Primary Survey 2020

Table-5.52: Challenges faced by Traders on e-NAM

Challenges faced on e-NAM	Responses		
	True	False	Not Responded
Complex Grading and Assaying	87 (53.4%)	71 (43.6%)	5 (3.1%)
Complex e-Payment realization	105 (64.4%)	50 (30.7)	8 (4.9%)
Delay in Dispute settlement	44 (27%)	114 (69.9%)	5 (3.1%)
Poor understanding of Concept	75 (46%)	83 (50.9%)	5 (3.1%)
Not well versed in technology	74 (45.5%)	84 (51.5%)	5 (3.1%)
Limited numbers of commodities covered under e-NAM	70 (42.9%)	87 (53.4%)	6 (3.7%)

Source: Primary Survey 2020

Problem faced by traders in transacting the produce through e-NAM

In order to understand the problems of transacting the produce through e-NAM, traders' responses were elicited (Table 5.53). Delayed payment and immediate cash requirement by farmers (23%) followed by complex and time consuming process (13%), poor storage (11%) etc., are the prioritized constraints.

Table-5.53: Various problems faced by traders on e-NAM

S. No.	Problems	Frequency	% age
1	Payment related (delayed payment and immediate cash requirement)	44	23.2%
2	Complex & time consuming Process	25	13.2%
3	Storage	21	11.1%
4	Internet connectivity	19	10.0%
5	Transportation	17	8.9%
6	Technology adoption	16	8.4%
7	Verification of Quality of produce	15	7.9%
8	Assaying & Grading Process	9	4.7%
9	Less Awareness on e-NAM	8	4.2%
10	No Better Price	7	3.7%
11	Poor Understanding of e-NAM	4	2.1%
12	Farmers unwillingness	4	2.1%
13	Other	1	0.5%

Source: Primary Survey 2020

5.8 Responses of Mandi Secretary

The stakeholders response is considered incomplete unless the insights of mandi officials are assessed. This is because, they have been actively engaged in the implementation of the e-NAM scheme in the mandies. In order to capture their insights, , a survey was conducted among Mandi Secretaries in the 31 APMCs of 13 states and the results are presented as under-

Profile of Mandi- It was found that, majority of mandies fall under A Class category followed by B class and SA class (Table 5.54).

Table 5.54: Detail of Classification of Mandi

S. No	Mandi Class	Numbers
1	SA Class	6
2	A Class	16
3	B Class	8
4	C Class	1
Total		**31**

Problem experienced by Secretaries on e-NAM Platform

As Mandi Secretary is a key element while implementing the e-NAM in the APMC Market yard, it is felt appropriate to ascertain his response regarding the constraints involved in the implementation of the scheme. Majority of the respondents opined poor infrastructure in the mandies, and immediate cash requirements of farmers are their major concerns (Table 5.55). In addition, trader's resistance, logistics and sensitization to stakeholders etc., in the system are also significant challenges in the system. Therefore, it is suggested to focus on infrastructure development to facilitate the buying and selling of commodities through e-NAM platform. Moreover, sensitization programs are also need of the hour to promote the awareness about the scheme.

Table-5.55: Major Problems experienced on e-NAM

Sl. No.	Major Problems	No. of Mandi Secretaries	% age
1	Poor Infrastructure	21	67.74
2	Asking Immediate Cash	20	64.52
3	Resistance From Traders	10	32.26
4	Logistics	10	32.26
5	Sensitization To Stakeholders	9	29.03
6	Less Skilled Labor	7	22.58

Benefits experienced by Mandi Secretaries in the e-NAM

While experiencing challenges of e-NAM, Mandi Secretaries have also experienced several benefits (Table 5.56). The survey reveals that e-NAM provides better price discovery compared to traditional system. This can be considered as a good sign towards farmers welfare through promoting income security. Other benefits include better transparency, time saving etc.

Table-5.56: Benefits of e-NAM experienced by Mandi Secretary

S. No.	Major Benefits of e-NAM	No. of Mandi Secretary	% age
1	Price Discovery	26	83.87
2	Proper Maintenance of Records (Transparency)	18	58.06
3	Time Savings	11	35.48
4	Providing Unified License	7	22.58
5	Less use of eco-friendly	3	9.68

Physical presence of traders during e-NAM transactions

1. Table-5.57 revealed that71% traders want to make their presence in the Mandi. However, 29% traders believe that the physical presence is not necessary as all the operations are digitalized and need proper watch on electronic platform which can be accessed from any location.

Table-5.57: Physical presence of traders and e-NAM

Whether physical presence of trader in the market reduced due to e-NAM		
Response	**Frequency**	**% age**
No	22	71.0
Yes	9	29.0
Total	**31**	**100**

Reasons for Physical Presence:

In order to understand the need of physical presence of traders in the e-NAM Mandi, the survey revealed that the traders want to interact with the farmers, want to see e-NAM transactions as the prioritized reasons.

Table-5.58: Reasons for Need of Physical Presence

Sl. No	Reason	Frequency	% age
1	Want to see farmers	20	91

2	Want to see operations	21	95
3	Mandi is our working space	20	91
4	Want to see commodity	22	95
Total		**22**	**100**

Impact of e-NAM on environment

It was found that, with the execution of e-NAM, there is no decline in the consumption of electricity and water (Table 5.59). Further, there is no or less impact of e-NAM on market environment (Table 5.60). .

Table-5.59: Whether electricity and water consumption has reduced due to e-NAM

S. No.	Response	Frequency	Percentage
1	No	25	80.6%
2	Yes	6	19.4%
Total		**31**	**100%**

Source: Primary Survey 2020

Table-5.60: Impact of personal vehicle and market pollution level

Parameter	Whether number of personal vehicle in to e-NAM mandi has reduced		Is there any impact on market pollution	
Response	**Frequency**	**% age**	**Frequency**	**% age**
No	29	93.5	27	87.1
Yes	2	6.5	4	12.9
Total	**31**	**100.0**	**31**	**100.0**

Source: Primary Survey 2020

Waste Management system in Mandi: It was found that only 35.5% of mandies are maintaining waste management system for which the Central Government is providing the funds. So, only 13% of the respondents opined that energy is being produced from the wastes of mandies.

Table-5.61: Response over Waste Management System

Parameter	Whether waste management system is in place		Is there energy produced from the waste of mandi	
Response	**Frequency**	**% age**	**Frequency**	**% age**
No	20	64.5%	27	87.1%
Yes	11	35.5%	4	12.9%
Total	**31**	**100%**	**31**	**100.0%**

Source: Primary Survey 2020

Capacity Building Programs: Capacity building is one of the necessary step towards awareness creation and education among stakeholders. Table-5.62 reveals that 96.8% of the respondents have received training at Gramsabha level to promote awareness about e-NAM portal and online transactions.

Table-5.62: Whether training is carry out for farmers at Gramsabha Panchayat

Response	Frequency	% age
No	1	3.2%
Yes	30	96.8%
Total	**31**	**100.0%**

Source: Primary Survey 2020

Hardware related issues at Mandi level: As hardware and software are most essential component of the e-NAM system, the study also provides a road map for administrators to address the issues related to maintenance of hardware. Table-5.63 shows that 22.6% respondents have no annual maintenance provision in their mandi which is directly linked with the better, real-time, uninterrupted services by the mandi.

Table-5.63 whether annual maintenance of hardware is done Yes / No

S. No.	Response	Frequency	Percentage
1	No	7	22.6%
2	Yes	24	77.4%
Total		**31**	**100.0%**

Further, looking at the importance of the hardware in the online platform, the role of manpower with respect to the maintenance was analyzed and Table-5.64 reveals that 77.4 % of trained manpower are dealing with maintenance of hardware and 22.6 % are not trained on these lines.

Table-5.64: Do you have trained man power to deal with maintenance of hardware

S. No.	Response	Frequency	% age
1	No	7	22.6%
2	Yes	24	77.4%
Total		**31**	**100.0%**

Chapter 6

Suggestions and Recommendations

1. It is high time to improve the infrastructure related to e-NAM implementation so that the scheme will run smoothly.
2. In most of the mandies, no POS machine facility was available for facilitating the online payment process. So, this machine should be installed to encourage transparent and online payment process to the stakeholders.
3. There is a need to improve the software support provided to mandi for smooth functioning of e-NAM. This is because, the software infrastructure is a prime issue in majority of mandies.
4. In most of the mandies, IT staff and mandi analyst working on contractual basis or through some agency, are not taking much interest in their work because they are low paid employees. Since, IT and market analysis job carry lot of responsibility in mandi operations, it is recommended to create permanent positions for these cadres to handle the works efficiently.
5. In case of Lucknow and Bareilly mandies, generators should be installed for power back up plan during emergency and power cut.
6. In case of Nokha and Mandawari mandies, the bandwidth connection was only 4 Mbps. So, there is a need to upgrade the connection for effective and smooth implementation of e-NAM in these mandies.
7. E-Gate entry at Display Shed is required for proper management of crowd at main gate. In mandies kike Tundla and Haldwani, this facility was not available. Hence, they should be installed with this facility to control the crowd during peak hours and harvesting season.
8. Electronic weighing machine/bridge facility is one of the important part of marketing activities. It is to be installed in Khandwa and Itarasi mandies of Madhya Pradesh for smooth functioning of the mandi system and handle the crowd during peak season of harvest.

9. Adequate number of grading staff are to be provided in Haldwani and Dehradun mandies of Uttrakhand, so that grading of commodities can be done quickly and to enable the process of e-NAM transactions faster.

10. Net connection is required to be installed in Bhiloda mandi of Gujarat and Bandrol mandi of Himachal Pradesh.

11. In mandies like Bhiloda, Sakhigopal and Nabrangpur mandies, the Electronic Weighing machines are required for proper weighment activities.

12. Mandi analysts are required to be placed in mandies like Nizamabad, Nabrangpur, Khammam and Sakhigopal, since analysis of commodities are required to be done properly before loading on e-NAM platform.

13. IT staff is an important part of e-NAM mandies, because they handle the IT related solutions and support enabling e-NAM functioning properly. It has been observed that these staff are lacking in the mandies like Charkhidadri, Ellenabad, Karnal, Akaola, Annamalai, Solan and Simlipal. Hence, these mandies are not functioning properly. So, there is a need to deploy the IT staff for smooth functioning of e-NAM platform in these mandies.

14. Warehouse integration was observed in the states of Telangana (Nijamabad Mandi), Gujarat (Bhiloda Mandi), Madhya Pradesh (Itarsi Mandi), Odisha (Nabrangpur Mandi) and Uttrakhand (Dehradun Mandi) and this is a good move by respective State Governments. This integration of mandies with local warehouses will provide accurate information and location to the stakeholders for storage of their commodities. Hence, it is suggested to integrate all the mandies with the local warehouses so that farmers and other stakeholders can enjoy the benefits at times of peak marketing season and harvesting season.

15. It was observed that some of mandies do not have the facilities of electronic gate-pass, electronic display board, integration of weighment with e-NAM portal and facility of exit gate-pass in Tundla, Lucknow, Mandawari, Nokha and Ramganj mandies. Hence, the above facilities should be strengthened in these mandies.

16. It was noticed during the study that the facility of issuance electronic gate-pass is not in operation in Dhalli and Bandrol mandies of Himachal Pradesh. The important market operations required for e-NAM like e-agreement, generation of sale receipt, assaying lab and online payment settlement are available in surveyed mandies of Haryana, Himachal Pradesh and Maharashtra. However, these mandies were note integrated with warehouses which is in important operation of agriculture marketing. The facility of integration of weighment with e-NAM portal is only available in Dhalli mandi in Himachal Pradesh. Non availability of these infrastructure in mandies, practically hampered the marketing operations and suggested to incorporate these facilities in a accelerated manner to improve the efficiency of mandies.

17. The study revealed there is greater dependency of farmers on the market intermediaries. Hence, it is suggested to minimize the role of these intermediaries and Mandi secretary need to provide effective and quick service to the farmers and also create faith in them and to reduce their dependency on the market intermediaries. There is a need to plan good sensitization programs to address these issues and the services of CCS NIAM can be utilized.

18. The Government has to make sincere efforts to create awareness among stakeholders in general and farmers in particular to increase the preference of choice of e-NAM. This process will also be helpful in reducing the dependency on intermediaries and increase the choice of farmers towards e-NAM.

19. Farmer's active participation is one of the essential activity in the progress of e-NAM. Hence, there is an urgent need to create sensitization on the e-NAM among the farmers for better utilization of the electronic system of trade for farmers' welfare per se. However, in few states such as West Bengal, Uttar Pradesh, Odisha and Rajasthan, it is significantly poor and in case of West Bengal the situation is alarming. In such states, it is suggested to initiate sensitization programs and awareness programs in a priority mode with active involvement of State Agricultural Marketing Department or Board.

20. Good number of training programs should be organized at mandi level to ensure better participation of stakeholders in the e-NAM transactions. Separate budget provision should be made at each SAMB level for this purpose. The training programs can be organized at convenient place where farmers can reach easily, probably, and this may be conducted at Gram Sabha level.
21. Training about e-NAM should be based on practical exposure rather that class room lectures. Further, practical exposure to mandi visit is most important and is also preferred by the farmers.
22. Most of the respondents are facing significant challenges while dealing with e-NAM platform like payment related issues, grading and assaying issue and complexity in the process of using e-NAM. The challenges are mostly related to technology(digital technology), acceptance of parameters assayed by assaying machines or complexity of e-NAM process (acceptance of digital platform) etc. Hence, more number of skill and soft skill capacity based programs should be organized among the farmers to address these practical issues.
23. . Despite of having smart phones in the hands of respondents, limited number of farmers are accessing e-NAM platform through mobile apps. Hence, it is suggested a soft skill training is very much required to the farmers to make use of e-NAM app from mobile phones.
24. The model of FPOs participation in e-NAM transactions should be increased and popularized across the States. A rigorous campaign should be started at each state to enrol more number of FPOs to transact through e-NAM portal. Further, FPO members should be imparted training about e-NAM procedures and benefits for better reach and understanding.
25. In most of the mandies, there is no waste management infrastructure available to deal with the wastage generated during the day to day marketing operations. As a result, it may affect the health issues of stakeholders and customers visiting the APMC mandies. So, there is a dire need to establish the waste management unit in all mandies to deal with waste generated in the premises.

For this purpose, provision for separate financial arrangement can be done at Ministry level. A campaign should also be initiated at each and every mandi to make them aware about the ill effects of waste.

26. For effective implementation of e-NAM, Central Government had given one-time grant of Rs. 75 lakh to each mandi for betterment of the system of marketing. Out of total assistance, Rs. 30 lakh per market was allocated for creation of IT facility and Quality assaying related laboratory infrastructure development and Rs. 40 lakh was allocated for developing grading/sorting and packaging facility and remaining Rs. 5 lakh for compost development and waste management system in the mandi. It is suggested that the fund allocation in every segment should also be increased to handle the activities effectively. Special emphasis should be given to increase the grant in the segment of waste management, because the funds allocated for this purpose are not adequate enough, especially in case of big mandies.
27. Since most of the sellers use to bid their produce at the last minutes only; the initial bidding price should start with 5% higher price over the previous successful bid. It is also suggested to increase the bidding time to at least 30 minutes.
28. Context displayed in the projector screen should be in local language well-versed to the farmers and other stakeholders so that they can understand easily. The display should also be clearly visible even from a distance
29. Traders may be incentivized to participate in e-NAM system by way of reduction in APMC fees.
30. It was observed that when more numbers of farmers trade their produce in the e-NAM auction, it leads to more time consuming and the farmers have to wait for their turn to bid individually in the bidding room. Thus, it is important to increase the bidding room and number of computers to reduce the time allotted for e-NAM auction.
31. Establishment of an Apex Body is advocated to control and regulate the actives of e-NAM. APMCs should start providing small loans to encourage

the farmers to participate in e-NAM and this will in turn also help them to get rid from the clutches of local money lenders

32. Bank branches should be opened on the premises of APMCs which will help the farmers to get instant payments and reduce the transaction costs.
33. Print media and social media advertisements should be given to make more people aware of e-NAM system; especially the small and marginal farmers and proper feedback system should be created to understand the problems faced by the farmers and traders which in turn will help to improve the e-NAM system.
34. Number of single license holders should be increased and encourage them to participate in e-NAM transactions

From this study, it can be inferred that the administration of agricultural marketing is carried on by the respective States as per their agri-marketing regulations and every State is further divided into several market areas monitored by the APMCs. So, as the markets are fragmented even within the State level, to ensure free flow of agricultural trade both at inter-mandi and inter-state levels, e-NAM is the best platform. It thus helps in creating a unified market through online trading both at State and National levels. This e-NAM concept further ensures various benefits like streamlining of procedures across the integrated markets, promotes real time price discovery based on actual demand and supply, removes information asymmetry between buyers and sellers, promotes transparency in auction process, promotes access to a nation-wide market for the farmer along with prices commensurate with quality of his produce and online payment of sales proceeds. The recently passed ordinances by the Government of India viz., Farmers Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020 and the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance, 2020 further encourage the farmers to transact through online platform. Even the warehouse-based and FPO-based trading modules ensure the farmers to sell the produce anywhere in the country as part of “one country one market”. This will facilitate the farmers to overcome distress sales of produce. When the trade areas are not restricted as per the

new ordinances and with the introduction of Agriculture Infrastructure Fund (AIF) scheme, there is immense scope to popularize the e-NAM concept.

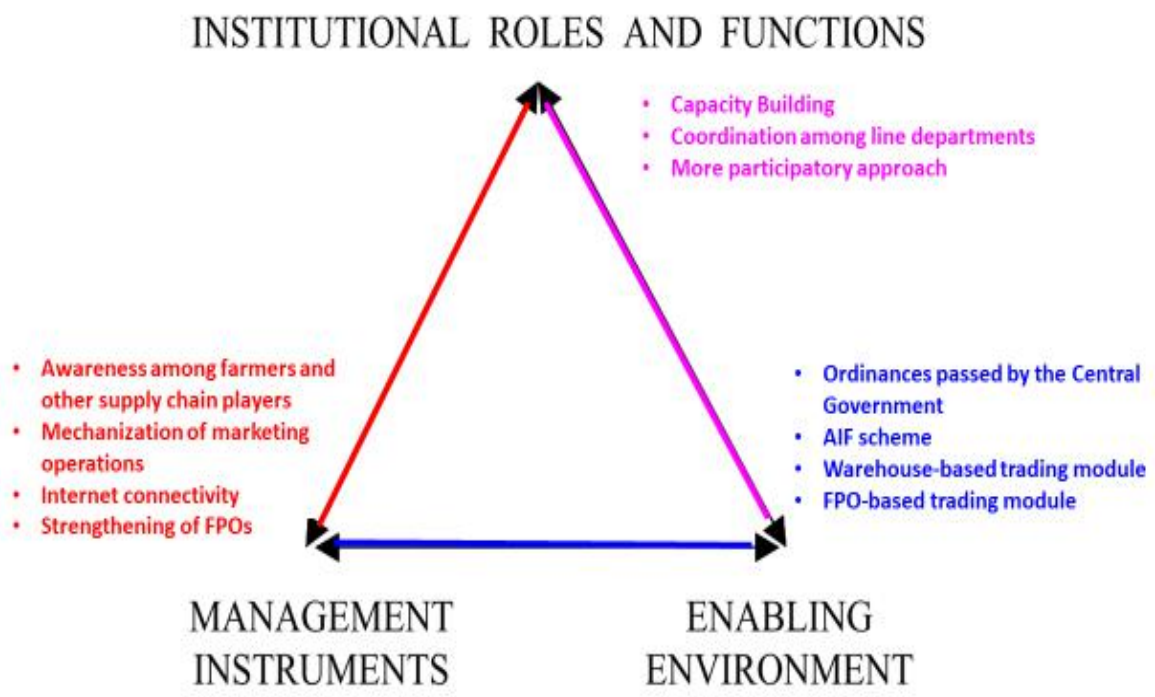


Figure 8: Broader Areas to Popularize e-NAM in India

As Agricultural Marketing is a State subject, the enabling environment (Figure 8) in the country in general and across the States in particular should pose a favourable picture for executing different interventions towards popularizing the e-NAM concept. Even the institutional roles and functions and management instruments should ensure positive picture to realize the true benefits of e-NAM. The National level institutions like NIAM and National Institute of Agricultural Extension Management (MANAGE) should assume pro-active roles in guiding the Officials of Department of Agricultural Marketing and SAMBs through imparting capacity building programs along with other stakeholders of agri-supply chains. The Government's commitment towards the farmers through passing the Ordinances recently will definitely have far reaching implications for agricultural transformation in India. These Ordinances ensure barrier-free trade and can create a farmer and trader-friendly environment and in this context, the concept of e-NAM certainly plays a crucial role. So, the e-NAM concept should be viewed in a broader perspective to further gear up the Indian agricultural market reforms. However, the fruits of e-NAM

concept can be better realized in the near future, if the State Governments develop their own contextualized strategies to popularize it among the farmers and other stakeholders of agri-business.

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