

Benefits of eNAM Process to Farmers - A Study



**Sathyendra Kumar A D
Satish Chandra Pant**

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Researchers

Dr. Sathyendra Kumar A D
Assistant Professor

Dr. Satish Chandra Pant
Assistant Professor



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CCS NATIONAL INSTITUTE OF AGRICULTURAL MARKETING

(An Autonomous Organization of Ministry of Agriculture and Farmers' Welfare, GoI)

KotaRoad, Bambala, Pratap Nagar, Jaipur–302 033, Rajasthan.

www.ccsniam.gov.in

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(An Autonomous Organization of Ministry of Agriculture and
Farmers' Welfare, GoI)

Kota Road, Bambala, Pratap Nagar, Jaipur–302 033, Rajasthan, India

Phone: 0141-2795104

Email-Id: dgccsniam@gmail.com

Website: www.ccsniam.gov.in

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1. Introduction

In India agricultural marketing was governed by a set of public owned wholesale markets which were established during the colonial period under the APMC Act. The regulatory mechanism, which is more than 100 years old, no doubt, has put in place some good marketing practices but the system is also fighting with few shortcomings due to various regulatory mechanisms and restrictions on trading of agricultural commodities. Therefore, to mainstream the activities the Government of India brought reforms to the sector through the Model Act 2003 and APLM Act 2017. The Model Act envisaged removal of restrictions on movement of commodities, single levy of market fee, promotion of alternative marketing system, promotion of ICT etc. The objective of all these attempts was to bring in reforms, mainly to remove restrictions in agricultural trade and induce a competitive environment by ensuring more and more participation of traders by leveraging ICT and alternative market channels.

In view of this to address the complex regulatory mechanism and restrictions, the Union Budget 2014–15 proposed the idea of a unified common market platform, launched on 14th April, 2016, a Pan-India electronic trading portal known as National Agricultural Market (e-NAM). It is a virtual market platform linking the existing physical Mandis i.e. APMCs electronically with a theme of “one nation, one market” as eNAM market.

e-NAM promotes uniformity, streamlining of procedures across the integrated markets, removes the information gap between buyers and sellers and promotes real time price discovery based on actual demand and supply in the market. It provides transparency in the auction process and access to a nationwide market to both the parties.

eNAM (National Agricultural Market) was rolled out with the following vision, mission and objectives.

Vision:

To promote uniformity in agriculture marketing by streamlining of procedures across the integrated markets, to promote free trade across the states,

removing information asymmetry between buyers and sellers and promoting real time price discovery based on actual demand and supply.

Mission:

Integration of APMCs across the country through a common online market platform to facilitate pan-India trade in agriculture commodities, providing better price discovery through transparent auction process based on quality of produce and ensure timely online payment.

Objectives of e-NAM:

1. A national e-market platform for transparent sale transactions and price discovery initially in regulated markets. Willing States to accordingly enact suitable provisions in their APMC Act for promotion of e trading by their State Agricultural Marketing Board/APMC.
2. Liberal licensing of traders / buyers and commission agents by State authorities without any pre-condition of physical presence or possession of shop /premises in the market yard.
3. One license for a trader valid across all markets in the State.
4. Harmonisation 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.
5. Single point levy of market fees, i.e. on the first wholesale purchase from the farmer.
6. Provision of Soil Testing Laboratories in/ or near the selected mandi to facilitate visiting farmers to access this facility in the mandi itself.

Features of e-NAM:

e-NAM is the largest e-trading platform for farmers in India. It is envisaged to protect the farmers' as well as consumer's interest in fair agricultural marketing practices. Many features such as the provision of online trading for better transparency and accountability, assaying facilities for fair prices against quality, online auction for fair and transparent price discovery, weighment integration for accuracy, online payment for right time price realization makes e-NAM superior to the traditional system. In addition, e-NAM Mobile application provides handy information to the stakeholders at any place and time.

e-NAM Portal helps in providing a single window service in all aspects like commodity arrivals, price information, buy & sell trade offers, provision to respond to trade offers etc. While material flow (agriculture produce) continues to happen through Mandis (markets). This online market reduces transaction costs and helps in overcoming the information asymmetry. It also helps in scientific price discovery through increased participation of traders across the country. Moreover, it has its positive impacts on the Institution and physical environment, balanced development across the states, competitiveness, farmer's participation, better price, price transparency, reduction in number of intermediaries and creation of new markets.

2. Provisions for establishment of e-NAM under Model

APLM Act, 2017

In April 2017, the Union Ministry of Agriculture and Farmers Welfare drafted the Model Agricultural Produce and Livestock Marketing (Promotion & Facilitation) Act, 2017. Salient features with respect to e-NAM under the new Model Act are as under-

1. Abolition of fragmentation of market by removing the concept of notified market area within the State/Union Territory (UT), which means, the APLM Act provides for the recognition of a state/UT as a single market.
2. The act advocates the promotion of direct interface between farmers and end users/processors/exporters/bulk-buyers to reduce the price spread thereby bringing advantage to both the parties involved in a trade.
3. Enhancement of Transparency through e-trading in various trade operations and integration of markets across geographies.
4. Provision of single point levy of market fee and unified single trading license across the State/UT to realize cost-effective transactions.
5. Promotion of the national market for agricultural produce through provisioning of inter- state trading license, grading and standardization and quality certification.

3. Status of e-NAM in India

With the aim of promoting uniformity in Agricultural Marketing in India, 1,000 Mandis have been integrated across 18 states and 2 Union Territories. The details of Mandis covered under e-NAM are depicted in the table 1 and figure 1.

Table 1: e-NAM Markets Across India

Sl. No	State	Total Mandi
1	Andhra Pradesh	33
2	Chandigarh (UT)	01
3	Chhattisgarh	14
4	Gujarat	122
5	Haryana	81
6	Himachal Pradesh	19
7	Jammu and Kashmir (UT)	02
8	Jharkhand	19
9	Karnataka	02
10	Kerala	06
11	Madhya Pradesh	80
12	Maharashtra	118
13	Odisha	41
14	Puducherry (UT)	02
15	Punjab	37
16	Rajasthan	144
17	Tamil Nadu	63
18	Telangana	57
19	Uttar Pradesh	125
20	Uttarakhand	16
21	West Bengal	18
Total Mandis		1000

Source: <https://e-NAM.gov.in/NAM/home/mandis.html>

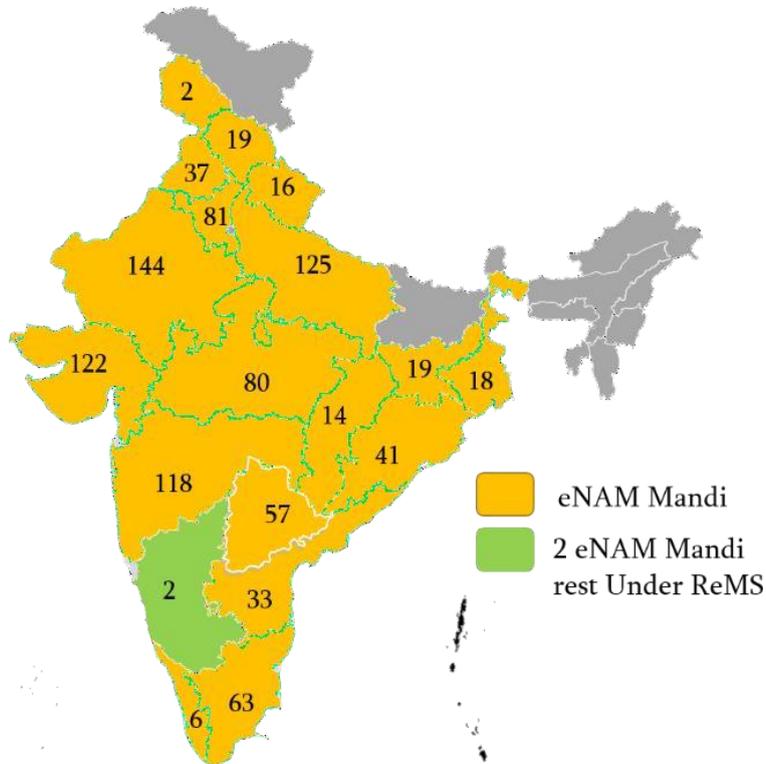


Fig:1 e-NAM Coverage states

Commodities traded under e-NAM: eNAM provides a virtual platform to farmers and traders to perform commerce and trade across the states with one nation one market approach. 175 Commodities including food grains, oilseeds, fruits & vegetables, spices etc. are listed in the eNAM market. Till the 30th June 2020, agricultural produce having total volume of 3.54 crore MT with value of 1,02,529 crores has been traded through e-NAM portal. Table 2 shows the breakup of total 175 commodities traded under e-NAM.

Table 2: Commodities covered under e-NAM

Commodities group	Total Number
Food Grains / Cereals	26
Oilseeds	14
Fruits	31
Vegetables	50
Spices	16
Miscellaneous	38
Total	175

Source: <https://e-NAM.gov.in/web/commodity/commodity-list>

4. Trade Performance in eNAM platform:

Trade performance of eNAM was analyzed in terms of Quantity and value of commodity traded in the eNAM platform to understand the acceptance of eNAM among participants.

Table 3: Quantity of commodity traded in eNAM platform from 2016-17 to 2019-20

Year	Quantity: Metric Tons					
	Food Grains	Oilseeds	Fruits	Vegetables	Spices	Miscellaneous
2016-17	4247151.72	326332.80	36008.73	274885.19	111472.16	5576.73
2017-18	6797886.89	787654.52	161714.88	713327.10	590019.81	674156.04
2018-19	4754556.4	958727.75	137674.81	944103.63	763995.30	711643.93
2019-20	6453645.99	991645.07	141366.57	981917.94	743672.09	1227013.01
CAGR (percent)	9.39	42.35	48.32	50.68	81.34	407.10

Source: <https://e-NAM.gov.in/>

Table 3 indicates quantity of commodities traded under various heads through eNAM platform from 2016-17 to 2019-20 and corresponding Compound Annual Growth Rate (CAGR) of the same.

Table 4: Value of commodity traded in eNAM platform from 2016-17 to 2019-20

Value: Rs. in crores

Year	Food Grains	Oilseeds	Fruits	Vegetables	Spices	Miscellaneous
2016-17	8203.22	1325.81	55.22	171.50	816.00	10571.75
2017-18	14032.82	2932.49	358.48	721.13	4078.68	22123.60
2018-19	12502.25	3570.41	377.42	766.83	5473.89	22690.80
2019-20	16411.35	3964.59	331.65	1202.51	6672.78	28582.88
CAGR (percent)	21.71	41.67	72.11	80.47	93.45	35.11

Source: <https://e-NAM.gov.in/>

Similarly, Table 4 exhibits value of commodity traded in various subheads in eNAM platform from 2016-17 to 2019-20 and their corresponding Compound Annual Growth Rates (CAGR) in the online marketplace i.e. eNAM platform.

Table 3 and 4 reveals that compound annual growth rate of traded quantity and value of food grain is 9.39 percent and 21.71 percent respectively, which indicates that compound growth rate of food grain trade in eNAM platform is showing comparatively higher positive growth in terms of quality and value comparison since inception of eNAM.

Likewise, The compound growth rate of oil seeds trade in eNAM platform is 42.35 percent and 41.67 percent respectively for quantity traded and value terms, which shows that trade of oil seed in eNAM platform is also having higher positive growth during study period.

Performance of fruits and vegetables trade in eNAM platform were also analyzed and the data reveals the positive growth rate with 48.32 percent of quantity and 72.11 percent of value of fruits, and 50.68 percent of quantity and 80.47 percent value of vegetables are being transacted during 2016-17 to 2019-20.

Similarly, there is a high rate of positive growth in case of spices were found with with 81.34 percent growth in terms of quantity traded and 93.45 percent growth in terms of value during the study period.

In case of Miscellaneous commodities which are not included in any of group, again remarkable growth rate since inception of eNAM was observed. Which shows

that in terms of Quantity traded growth rate of 407.10 percent and in terms of value traded the growth rate of 35.11 percent were achieved through eNAM platform during 2016-17 to 2019-20.

The overall analysis indicates that, eNAM is achieving a milestone in the transition of age-old system of trading in the primary Agriculture market into modern marketing through online trading. Constant effort from government in development of digital platform across the nation, popularizing the system through stakeholder sensitization programmes and increasing the transparency in the existing system through digital operations are few reasons for this gradual changes and witnessed positive growth in the past few years.

5. e-NAM Process Flow

- 1. Gate entry:** Trade process flow starts from the Gate entry. Once a farmer entered the market along with his/her commodity, he/she has to inform to the gate and accordingly an electronic gate entry slip is generated. An entry slip consists of lot code (as a sequence of Mandi code-year-month-date-lot of the day), Farmer's name, Mobile Number of the farmer, Village, Commission Agent's name and Company, Commodity, number of Bags, Bag type, Approximate quantity, Vehicle Number, Market/sub market detail, Lot type (primary or secondary sales) and government ID. In this process, Registration is done for the first time mandi visitors.
- 2. Unloading of Commodity at Auction/Trading platform and Assaying:** After gate entry, farmer must unload the commodity at the Auction platform. If farmer wish to trade with any particular trader or commission agent in that case on his/her demand the particular commission agent/trader has to be allocated to farmer and the entry has to be made in the gate entry slip, otherwise, farmers can unload their produce in any of the trading platforms. The lot ID (gate entry slip) is displayed on the top of the lot in the trading platform. The Assaying Lab technician from the APMC will visit the lot and collect a minimum of 250grams of the sample of the commodity for assaying. The quantum of sample may vary from 250-500 gm as per the commodity specific assaying requirement. After drawing the sample, the assaying process is completed and the assaying report against the lot number

is uploaded to e-NAM website for the next process. However, if the assaying machinery is not available (for some of the commodities like moth and spices) the quality of the commodity is assessed on the basis of a physical examination by traders/commission agents.

- 3. Generate e-bidding:** Based on the assaying report, mandi officials generate the e-bidding and fix the maximum bidding time. Traders will be quoting their price electronically for their interested lot. The same will be displayed on the display board at APMC.
- 4. Bid Declaration:** Once the bidding time is over, a message of the highest Bid price is sent to the farmer's registered mobile number or he can view lot number wise final price displayed on the e-display board at APMC. If the farmer accepts the final price, the lot will be allotted to the trader for final purchase. If the farmer does not agree with the price, he/she may again go for e-auction.
- 5. Weighment of sold commodity:** After successful completion of the auction process, the next process is Weighment of the commodity. Weighing of the commodity is done on the electronic weighing machine by the weigh men appointed by the mandi.
- 6. Generation of Sale Agreement:** A primary bill is generated after Weighment. The sale bill contains Trader name and license number, Farmer detail, Commission agent Name and his license number, Agreement number, Commodity detail, packaging type and weight of the bag, Commodity price, Farmers price, Commission agent fee, Mandi fee etc.
- 7. Payment to farmers & others:** Once the sale bill is generated, the buyer sends the money through RTGS/NEFT/ cash deposit through bank challan. At present farmers are demanding immediate cash, hence, the buyer pays cash to the farmer directly.
- 8. Gate exit pass and gate exit:** After successful payment to the farmer, the commodity is handed over to the trader and subsequently the mandi official generates the exit pass which contains gate exit number, exit type, Vehicle

number, APMC detail, Trader, lot type, Commodity, lot code, Bag type, number of bag and weight/ total number.

6. Review of Literature

The study on Performance of eNAM in Rajasthan conducted by **NIAM (2019)** identified that 59.56 percent of the farmers were not aware about the eNAM and found that sensitization methods used by stakeholders who were actively engaged in the extension and promotion of the scheme were inappropriate to maximise the reach of the eNAM to the unreached. The study recommended various sensitization methods for different functionaries for creating, conducive and executing the sensitization programmes for better connectivity of farmers (sellers) and traders (Buyers) in the e-trading platform.

The study on e-NAM by **MANAGE (2018)** conducted in Telangana suggested adoption of innovative ways to facilitate the process smoothly during the peak season by issuing of e-gate passes, utilization of bidding/tender hall, hand-held devices etc. The study also suggested use of standard practices during the bidding process for uniformity and convenience. The uniformity in the bidding process is suggested in the wake of different processes followed by different states. For e.g. Karnataka follows closed tender system, while, Rajasthan follows open tender method. The study advocates about the uses of closed bidding to have a transparent approach for better price realization and thus increased income to the farmers. Moreover, the study also suggests 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.

In a similar study on e-NAM by **Reddy (2018)**, undertaken in Karnataka examines experiences of e- markets with an objective to suggest improvements to 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 compares the differences in market processes using a process stakeholder analysis framework for comparing traditional markets with e-markets of Karnataka. The study concluded that for the success of e-markets, interests of all the participants (including farmers, traders and commission agents) have to be taken into account for better results.

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, it was suggested that the e-NAM platform can be further strengthened by encompassing these factors into the system.

Chand R. (2016), brought out various issues in the “Commentary on ‘e-Platform for National Agricultural Market’ portrays success of e-NAM including reforms undertaken for Agricultural Markets nationwide”. It reveals that the full benefits from e-NAM can only be realized when a single license for trading is valid across the state and then the whole nation so that farmers can get the advantage of the competitive environment and sell their produce anywhere in the country for price realization. Four important areas which were not part of e-NAM which can be included in e-NAM discussed in the commentary are: (a) Direct sale by farmers to buyers, processors, or, contract marketing without bringing the produce to the mandi and selling from farmers own field or farm (b) Establishment of private markets with treatment at par with APMC. (c) Removal of legal barriers to entry of organized and modern capital and investments into agricultural marketing. This will require tweaking the Essential Commodities Act to draw distinction between genuine service providers and black marketers/hoarders; and (d) Rationalization of market fee, commission charges, cess and taxes and development charges to make farmers realize that e-NAM is really doing good for them.

Dey Kushankur (2016), in his study gave an insight on ‘National Agriculture Market: Roll-out Rationale and Ramifications. It portrays the essentiality of improvisations needed in the National Agriculture Market by appointing diverse and discursive service providers for various domains. This insight, deals with benefits of a negotiated system in trading avenue and associated services in terms of price and quality information of traded commodities which may not accrue to small and marginal farmers. It also says that there should be greater harmonization between the quality standards of agricultural produce and

infrastructure required for assaying the produce properly in every market which will enable the buyers about authenticity of agricultural produce. Further, a provision of soil testing laboratories can enable farmers access the soil testing facility that might impact input use efficiency, soil fertility and crop productivity. The SFAC has appointed Nagarjuna Fertilizers and Chemicals as a strategic partner which could also offer customised services to concerned APMCs and oversee the integration of those APMCs with the demutualised electronic spot trading portal.

According to **Dey Kushankur (2015)**, in a study on how Public–Private Partnership (PPP) can embrace agri-value chain management, Agri-business value chain is essential from production to procurement and distribution to consumption to complement a diverse group of agents such as resource provider/supplier, transporter, producer, processor, distributor and markets.

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 demand. These markets are located generally far from most of the villages and hence, to reach these distant places is quite a tedious and costly affair for the small and medium farmers. As a result, they find it economical to sell their produce to the intermediaries which fetches a lower price to the farmers’ produce. Intermediaries work out a margin for themselves and escalate the cost in the next phase and it is the farmer (being the first seller) who bears the brunt of the ultimate cost. On the other hand, the consumer is at the receiving end.

7. Objectives of the study

1. To Study the Awareness about eNAM concept and benefits among farmers.
2. To analyze the understandability and perception of e-NAM process among farmers.

8. Importance of the Study

The study aims at understanding the benefits of e-NAM process for the farmers in marketing of commodity and measuring the extent of awareness of e-NAM process among the farming community. The outcome of the study is expected to give a direction or advisory to policy makers, thinkers, and the government for simplification of e-NAM process in a better way. The study bridges

the gap between what is provided and what is needed so that farmers can reap maximum benefit of e-NAM platform and in turn build farmers prosperity in the country.

9. Material and Methods

The study is primary data based study. The data was collected from the farmers who are actively engaged in trading through e-NAM platform in APMC Market yard. Six States i.e. Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh, Chhattisgarh, and Rajasthan were selected purposely to represent north and south part of the country. Out of these selected States, one mandi from each State was considered for the study. The outcome of the study is based on the observations and information on eNAM process flow collected from farmers in the selected APMCs.

Total 306 farmers were selected purposely for studying the behaviour of farmers who have gone through electronic trade in the selected States. From each mandi 50 farmers were selected to understand the insights of farmers on benefits of eNAM. In case of Nizamabad mandi of Telangana 56 farmers were selected to analyze the insights. The detail of sampling procedure is given in table 5.

Table 5: Farmers sample of Selected Mandis

S. No.	APMC	State	Farmers
1.	Adoni	Andhra Pradesh	50
2.	Kurud	Chhattisgarh	50
3.	Karond	Madhya Pradesh	50
4.	Waradha	Maharashtra	50
5.	Newai	Rajasthan	50
6.	Nizamabad	Telangana	56
Total			306

Simple statistical tools such as frequency, percentage etc. were used to analyze the farmers perception on benefits of eNAM in each process flow.

10. Limitations of the Study

The study is confined to six eNAM mandi from six States in India to understand the insights of the behaviour of the farmers who have been engaged in the electronic trading platform. Thus, the study only provides an overview which may be

beneficial to probe further in-depth analysis for better understanding of the behaviour. The findings of the study are expected to have practical utility for researcher and policy maker to draw some conclusion from this study, though require further analysis.

11. Results & Discussions

11.1 Awareness of e-NAM process & its benefits among farmers

As awareness of any scheme or program is necessary for effective progress and outcome therefore a survey was conducted among sample participants (farmers) to know the status of awareness of e-NAM process and its benefit. Table 6 exhibits about 67.32 percent of sample respondents were aware about the process, concept and benefits of eNAM. On contrary 32.68 percent farmers are still unaware about e-NAM process which shows that there is an urgent need to strengthen the capacity building programs specially trainings and exposure visits for better understanding of farmers with respect to e-NAM process and its benefits.

Table 6: Awareness of e-NAM concept and befits to farmers

Response	No. of Farmers	Percent
Aware about e-NAM	206	67.32
Unaware about e-NAM	100	32.68
Total	306	100

Source: Primary Data 2019-20

11.2 Farmers perception on importance and necessity of assaying in eNAM

Assaying of agricultural commodities in the e-NAM process is considered as one of the most essential activity to build trust among all the participants in the trade process therefore, establishment of assaying lab is a pre-requisite for eNAM. In this context, during the survey farmers were asked about importance and benefits of assaying in eNAM process flow. The results are exhibited in table 7. It reveals that, out of 206 aware farmers, 94.67 percent farmers have expressed that assaying is a necessary requirement of trade in the e-NAM platform, remaining 5.33 percent of farmers not satisfied with assaying process and they expressed assaying is not necessary for trading in eNAM platform. The interpretation reveals that majority of the farmers have faith in the assaying process, however, the study also indicates

minimal gap with respect to negative response over trust on assaying which can be addressed through sensitization programmers among farmers.

Table 7: Farmers perception on necessity of assaying in eNAM process

Response	No. of Farmers	Percent
Necessary	195	94.67
Not Necessary	11	5.33
Total	206	100

Source: Primary Data 2019-20

In order to understand the advantages of assaying amidst farmers, further information was collected from the farmers who have responded - Assaying is necessary for the trade. Out of 195 farmers who have responded - Assaying is a necessary requirement in eNAM platform, 42.05 percent of farmers expressed assaying facilitate easy fixation of the price of agricultural produce (Table 8), 17.05 percent of farmers responded that it provides Information of the quality of produce, 17.43 percent of farmers said it build confidence at the time of trading, 16.41 percent of farmers expressed that it helps to improve the quality of production, remaining 6.15 percent of farmers said it provides a proof for quality of their produce.

This interpretation clearly indicates that assaying is one of the important process observed by farmers in the trading process of eNAM, as it contributes to determining quality and price of the produce.

Table 8: Farmers perception on benefits of assaying in eNAM

Response	No. of Farmers	Percent
Easy to fix the price for the produce	82	42.05
Information of the quality of produce	35	17.95
Build a Confident at the time of trading trade	34	17.43
Improve the quality of production	32	16.41
Provide the proof of the quality of produce	12	6.15
Total	195	100

Source: Primary Data 2019-20

On contrary, table 9 shows the farmers perception on difficulties in Assaying process. Handful of farmers, who were against the assaying were further questioned about the reasons of their unsatisfaction and it was found that majority (81.90 percent) of them have expressed that assaying parameters are not satisfactory. While remaining 18.10 percent believed that there is less quality assurance of their produce. The major reason for this distrust among farmers must be their lack of knowledge about the testing parameters. Hence, they have to be exposed to the process of assaying through active participation for proper understanding of the system.

Table 9: Farmers perception on difficulties in Assaying in eNAM Platform

Response	No. of Farmers	Percent
Assaying parameters not satisfactory	9	81.9
Less quality assurance	2	18.1
Total	11	100

Source: Primary Data 2019-20

11.3 Farmer perception on importance of assaying in prices discovery

The major objective of e-NAM process is to help farmers to get better price realization for their quality produce. The process of assaying has played an important role to meet this objective.

Out of 206 farmers, 97.08 percent of farmers believed that assaying is a necessary requirement for price discovery (Table 10) and rest of the farmers think assaying as unnecessary requirement. It is clearly indicated that despite of having in the nascent stage, e-NAM is trying to meet its objective, however, there is an urgent need to improve the access of assaying process and parameters for the farmers to strengthen the eNAM process.

Table 10: Farmers response on importance of assaying for price discovery

Response	No. of Farmers	Percent
Assaying is necessary for price discovery	200	97.08
Assaying is not necessary for price discovery	6	2.92
Total	206	100

Source: Primary Data 2019-20

Furthermore, to understand in-depth insights of respondents with respect to importance of assaying in better price realization table 11 reveals that around 71 percent farmers responded that assaying built a confidence while fixing the prices for their commodity, 16.5 percent responded that scientific method of quality assaying is an important activity, while 10.5 and 2 percent farmer expressed easily understand the quality difference of the produce and attracting more numbers of buyers respectively as an importance of assaying in better price discovery.

Table 11: Farmer's response on reason for importance of assaying in better prices discovery

Factors	No. of Farmers	Percent
Confidence in fixing the prices	142	71.00
Scientific method of quality assaying	33	16.5
Easily understand the quality difference	21	10.5
Attracting more numbers of buyers	4	2.00
Total	200	100

Source: Primary Data 2019-20

Table 12 shows that out of 6 farmers who are not agree with assaying for price realization responded that assaying is not providing all information (50 percent), Less quality assurance (33.33 percent), and Do not found any difference with traditional method (16.67 percent). It is clearly indicating the lack of trust in the scientific techniques among a few farmers which must be built by taking them into the exposure visit or by other mean.

Table 12: Farmer's response on reason for not importance of assaying in better prices discovery

Factors	No. of Farmers	Percent
Assaying machinery not providing all information	3	50.00
Less quality assurance	2	33.33
Do not found any difference with traditional method	1	16.67
Total	6	100

Source: Primary Data 2019-20

11.4 Farmers perception on Competitiveness and transparency of e-NAM process with respect to e-Auction

Electronic auction is one of the important elements in the e-NAM process for achieving much transparency, accountability and competitiveness in trade and fair price discovery as compare to traditional method. Out of 206 farmers, 76.21 percent of the farmers were expressing e-Auction in e-NAM as a competitive and transparent process in trading (Table. 13) while 23.79 percent of the farmers have not found it satisfactory with e-auction. This gap shows the urgent call for better capacity building programme.

Table 13: Farmers perception on e-Auction in eNAM platform

Response	No. of Farmers	Percent
Competitive and transparent	157	76.21
Not competitive and transparent	49	23.79
Total	206	100

Source: Primary Data 2019-20

To understand the benefits perceived by farmers during e-auction, further information was collected from the farmers. Table 14 reveals that out of 157 respondents who had expressed e-auction as a competitive and transparent system, 52.86 percent of farmers responded that digital display of price is one of the key benefits followed by 20.38 percent favoring more number of buyers' participation, 17.83 percent says less Number of Intermediaries and 8.91 percent says Price of commodity is fixed based on assaying. The data is clearly indicating competitive and transparent process of e-auction in eNAM.

Table 14: Benefits of e-Auction among the farmers

Response	No. of Farmers	Percent
Digital Display of Price	83	52.86
More number of buyers' participation	32	20.38
Less Number of Intermediaries	28	17.83
Price of Commodity is fixed based on assaying	14	8.91
Total	157	100

Source: Primary Data 2019-20

Table 15 reveals that out of 49 farmers who were against the e-Auction process, 48.97 percent of farmers were in the opinion that e-auction process is not trustworthy process followed by 38.77 percent responded Invisibility of the auction

process, and 8.16 percent of farmers expressed no much difference between tradition and e-auction in terms of price realization.

Table 15: Farmer’s response on e-Auction is not competitive and transparent

Response	No. of Farmers	Percent
Not trustworthy	24	48.97
Invisibility of the auction process	19	38.77
Don not difference between tradition and e-auction in price realization	4	8.16
Total	49	100

Source: Primary Data 2019-20

11.5 Farmer perception on accuracy and transparency of e-NAM with respect to Weighment

One of the import objectives of APMC is to ensure accuracy in weighment and bring the transparency in the process thereby elimination of cheating in the process. Table 16 reveals farmers response on accuracy and transparency of weighment in eNAM process. Out of 206 farmers, 89.80 percent of farmers responded that weighment is accurate and transparent in the eNAM process, remaining 10.19 percent of farmers expressed opposite opinion on the same i.e. they were not satisfied with the accuracy and transparency in the system.

Table 16: Farmers perception on Weighment system in eNAM

Response	No. of Farmers	Percent
Accurate and Transparent	185	89.80
Not Accurate and Transparent	21	10.19
Total	206	100

Source: Primary Data 2019-20

Table 17 indicates the reasons for farmers response on problems in weighment. Out of 21 farmers who were not satisfied with accurate and transparent weighment system in eNAM were further probed and it was found that 61.90 percent respondents were not integrated with eNAM portal, 33.33 percent farmers are in the opinion that Weighment done in commission agent shop and 4.76 percent of farmers expressed no difference found in weighment process when compare to tradition process with e-NAM platform.

Table 17: Farmers response of problems in Weighment in eNAM System

Response	No. of Farmers	Percent
Not integrated with e-NAM portal	13	61.90
Weighment done in commission agent shop	7	33.33
No difference found in weighment	1	4.76
Total	21	100

Source: Primary Data 2019-20

11.6 Farmers perception on Competitiveness and transparency of payment system in the e-NAM platform

Cashless transaction is one of the important activities in e-NAM platform to facilitate transparent trade where payment is directly transferred from account to account. However, it was observed that farmers are not accepting this method agreeably. Table 18 shows that out of 206 farmers, 30.10 percent farmers are in favor of e-payment. However, remaining 69.90 percent farmers are against e-payment. It was observed that during the survey that farmers are demanding immediate cash payment after completion of trade.

Table 18: Farmer response on e-payment system in eNAM platform

Response	No. of Farmers	Percent
Satisfactory	62	30.10
Not Satisfactory	144	69.90
Total	206	100

Source: Primary Data 2019-20

Further, farmers perception on benefits of e-payment was recorded in Table 19 which shows that out of 62 farmers favoring e-payment, 69.35 percent farmers were in opinion of security of money associated with e transaction while 36.65 percent of farmers says that e-payment allows them to save money by limiting undue deduction of commission from buyer's hand.

Table 19: Farmers perception on befits of e-Payment in eNAM

Response	No. of Farmers	Percent
Security of money	43	69.35
Secured from undue deduction of commission	19	30.65
Total	62	100

Source: Primary Data 2019-20

Similarly, 144 farmers against the e-payment were also surveyed and their opinion was recorded to identify the constraints in the e-payment system. Table 20 depicts that 51.39 percent respondents have expressed requirement of immediate cash for their daily requirements, 39.58 percent respondents have no trust in online transactions and 9.03 percent respondents are in opinion that transfer of money will take longer time. It is understood from the table that Immediate cash requirement and lack of trust with online transaction are related to traditional practice of collecting tangible currency is which is highly demanded by farmers.

Table 20: Farmers response on constraints in e-Payment system in eNAM platform

Response	No. of Farmers	Percent
Immediate cash requirements for fulfil daily activity	74	51.39
Not trust with online transactions	57	39.58
Money transfer will take longer time period	13	9.03
Total	144	100

Source: Primary Data 2019-20

11.7 Farmers perception on Price in Traditional system and e-NAM platform

To provide remunerative price to the farmer for the commodity is one the objective of eNAM. Therefore, to know the farmers' perception on price discovery in eNAM and its comparison with tradition marketing system was recorded through a dichotomous question. Table 21 shows that out of 206 farmers, 53.40 percent farmers are in opinion that eNAM is a better platform and provides better price discovery as compare to traditional system. On contrary, 46.60 percent farmers were in the opinion that eNAM platform is not realizing better prices. This analysis shows that there is an urgent need to initiate programme for reach of eNAM at grass root level.

Table 21: Farmers perception on Price discovery in eNAM platform when compare to tradition mandi system

Response	No. of Farmers	Percent
Better price in eNAM platform	110	53.40
Not Better price in eNAM platform	96	46.60
Total	206	100

Source: Primary Data 2019-20

11.8 Farmer's Perception on Access to large number of buyers through online auction

The very purpose of electronic platform was to create competitiveness by providing number of buyers through eAuction process. In this regard farmers' perception on access to large number of buyers were understood and found that 60.68 percent of the farmers believe that eNAM provide the opportunity to reach large number of buyers (table 22). While remaining 39.32 percent farmers responded that through eNAM they are not reaching to large number of buyers which is an alarming situation for policy makers showing huge gap in the capacity building.

Table 22: Farmer's perception on reaching larger number of buyers through eNAM

Response	No. of Farmers	Percent
Reach large numbers of buyers	125	60.68
Not to reach large numbers of buyers	81	39.32
Total	206	100

Source: Primary Data 2019-20

11.9 Farmers Perception on development of healthy financial profile transacted through eNAM Platform

Farmers' perception on development of healthy financial profile was recorded in the Table 23. It reveals that with the eNAM trade 69.90 percent farmers believe that trade through eNAM platform is strengthening their financial profiles as compared to traditional market. On contrary, 30.10 percent farmers responded there is no relationship of eNAM trade and individual financial profile.

Table 23: Perception of farmers on Development of healthy financial profile

Response	No. of Farmers	Percent
Yes	144	69.90
No	62	30.10
Total	206	100

Source: Primary Data 2019-20

11.10 Farmer's perception on acceptance or rejection option of e-Bidding in eNAM platform

eNAM has given the power to the producer for rejection or acceptance of the bidding quote. If farmer find the quoted price underrated for his /her produce,

he/she may reject such trade and participate in another auction process. The respondents were asked about their perception on this rejection option and table 24 reveals that 77.18 percent farmers are in favor of the option while 22.82 percent respondents are against this feature.

Table 24: Farmers response on acceptance or rejection option of e-Bidding in eNAM

Response	No. of Farmers	Percent
Benefited	159	77.18
Not Benefited	47	22.82
Total	206	100

Source: Primary Data 2019-20

12. Findings, Suggestion and Conclusion

Major Findings of the Study

- 1. Awareness of e-NAM concept and benefits to farmers:** out of sampled respondents for the study, it was found that 67.3 percent of the entire farming community aware about the concept and benefits of eNAM in the study area
- 2. Farmers perception on necessary of assaying:** that study found that 94.7 percent of farmers are express assaying is a necessary for the e-Trade in eNAM platform. The reason is Easy to fix the price for the produce, Information of the quality of produce, build a Confident at the time of trading trade, Improve the quality of production and Provide the proof of the quality of produce.

Further, the study found that, 5 percent of farmers are not agreed with the Assaying process and reasons are Assaying parameters not satisfactory and Less quality assurance.
- 3. Importance of assaying in prices discovery:** the study found that, out of sampled respondents 97 percent of respondents express that assaying is necessary for price discovery for price discovery in eNAM platform, because it provide that opportunity to confidence in fixing the prices,

scientific method of quality assaying, easily understand the quality difference and attracting more numbers of buyers.

Further, study also shows that, there are 3 percent of farmers are not confident about assaying and they expressed that assaying process is not helpful for them as it doesn't provide all information to farmers. In addition, they believe that there is a less assurance on quality parameters of the system.

4. Competitiveness and transparency e-Auction System in e-NAM platform: the study found that, 76 percent of farmers expressed that e-Auction system is competitive and transparent, due to digital display of price, more number of buyers' participation, less number of intermediaries and price of commodity is being fixed based on assaying.

In contrast, remaining 24 percent of farmers are not happy with e-Auction system. They expressed lack of trust because of invisibility of the auction process and found no difference in tradition and e-auction in price realization.

5. Accuracy and Transparency in weighment: the study reveals that 90 percent farmers expressed weighment is accurate and transparent in eNAM platform. However, 10 percent of farmers expressed it inaccurate as weighment machines not integrated with e-NAM portal, it is still weighted at commission agent shop. They believe that weighment system in eNAM platform is not having any difference as compare to the tradition method.

6. e-Payment system in eNAM platform: it was found that 70 percent of farmers are not satisfied with e-Payment system and they expressed immediate need of cash requirements for fulfilling their daily activities and requirements Even, they do not trust with online transactions and money transfer as it takes longer time.

7. Price in Traditional system and e-NAM platform: the study was found that 53 percent of farmers expressed positive insights towards better price realization in eNAM platform as compare to the tradition platform .

- 8. Perception on Access to large number of buyers through online auction:**
it was found that 61 percent of farmers are expressed that e-NAM provide an opportunity to reach larger number of buyers through online action which in turn provide a better platform to farmers than traditional system.
- 9. Acceptance or rejection option of e-Bidding:** Study reveals that 77 percent of farmers expressed that acceptance and rejection option of e-Bidding is beneficial because it provides an opportunity to farmer to decide the price for produce and go for second time value realization.
- 10. Healthy financial profile through eNAM platform:** the study found that 70 percent of farmers persuade that eNAM provide an opportunity to develop the healthy financial profile through e-Payment and increasing the savings in the bank.

Suggestions

- 1. Extend the eNAM all the mandi:** Keeping the view of present reforms in agricultural marketing, it is suggested that state government should implement the eNAM all the market in the state, so that the competition will increase, and the farmers will get ultimate benefits on it.
- 2. Sensitization of the farmers:** Sensitization of the farming community with respect to eNAM, its process, its benefits and economic importance etc. will be given priority. The campaign must be designed in a systematic and scientific way for better impact in the minds of farmers.
- 3. Strengthening of Assaying:** Assaying has played a significant role in the overall process of eNAM. It gives an idea to both the parties involved in the trade on what to buy, what not to buy, how much to buy etc. Assaying which built trust among both the parties. Hence Commodity specific certified assaying machinery may be introduced in eNAM mandis and commodity specific trainings are to be designed to train farmers and other stakeholders in the process.
- 4. Third party assaying:** During the peak season, when markets are flooded with commodities, assaying become a major challenge in the mandis that

too with unskilled and limited manpower. Therefore, to overcome this challenge, it is suggested to create a space for a third-party assayer or assaying laboratory under Public Private Partnership model within the Mandi.

Charges for assaying: Commodity wise rate for assaying may be fixed by the state government and the cost of assaying may be met by the mandi. It can avoid unnecessary cost on machines and human resources and will lead to effective implementation.

5. **Linking the weighment machine in to eNAM platform:** In the present condition weighment machine are not connected with eNAM platform, hence it not built a confident among the farmers, hence it is suggested to connect the weighment machine to eNAM platform.
6. **Linking FPOs to eNAM:** FPOs are getting a unique space in major agricultural reforms and legislations in recent days. They may be considered as a special category and incentivized through special provisions such as nominal fee, cash rewards, recognition, and rewards etc. In addition, exclusive trainings should be planned for FPOs so that they can sell their produce through eNAM.
7. **Declare selected Mandis as a model eNAM mandi to educate stakeholders:** Few Mandis in a particular region may be declared as Model eNAM mandis and used for educating all the stakeholders including farmers, FPOs, traders and commission agents through various capacity building programmes.
8. **Categorization of markets:** Based on performance (value of trade) and infrastructure development, the existing markets may be ranked and categorized. Special incentives may be declared to those mandis are performing well, inform of development of infrastructure, commodity trading, Individual planning in development of mandis etc.
9. **Encourage the PPP Model to development infrastructures:** At present facilities available in the mandis to the farmers are very poor and hence, it will affect staying power of farmers. Therefore, it suggested to run the

mandis under PPP mode, so that private players are develop the infrastructure facilities inside the mandi.

10. Encourage the FPOs to trade in eNAM platform: FPOs are getting a unique space in major agricultural reforms and legislations in recent days. They may be considered as a trader cum commission agent and incentivized through special provisions such as nominal fee, cash rewards, recognition, and rewards etc. In addition, exclusive trainings should be planned for FPOs so that they can sell their produce through eNAM.

Conclusion

The e-NAM Portal helps in providing a single window service in all aspects like commodity arrivals & prices, buy & sell trade offers, provision to respond to trade offers etc. While material flow (agriculture produce) continues to happen through mandis (markets). An online market reduces costs of transaction and helps in overcoming information asymmetry. It also helps in scientific price discovery through increased participation of traders across the country. A Unified Agriculture Market has its positive impacts on Institution and physical environment, balanced development across the states, competitiveness, farmer's participation, better price, price transparency, reduction in number of intermediaries and creation of new markets.

The benefits of eNAM process to farmers was found a positive response in selected eNAM states in India. The evolution of the development of eNAM in India is providing a better platform for the farmers for effective online trading. It has been found that as perceived by the majority of farmers price discovery is improving through online trading since inception of the eNAM. It has now been capturing cent percent arrivals of commodity in the market, increasing the farmers registrations, which indicates acceptance and confident level of farmers has been increasing in the eNAM mandi. Scientific way of assaying also providing effective information to farmers for assessing the quality of produce and fix the value for their produce. However, it has been found that markets are facing pretty challenges in implementation of eNAM, such as edification of online system and process among the farmers, assaying machinery, basic infrastructure, online payment etc.,

In view of above findings, there is requirement to develop a scientific method of sensitization to popularize the eNAM in the state as well as in the country, hence an attempt is made to create a scientific method of promotion of eNAM for benefit of stakeholders in our previous study on Performance of eNAM in Rajasthan- A Case Study.

To overcome the challenges faced by the farmers in Agri-value chain, eNAM has to provide suitable solution through holistic development in the marketing system includes reforms in the state APMC Act, education of the stakeholders, development of necessary infrastructure facilities in the market, institutional support & good governance to address the dispute during the online trade. As farmer is one of the important stake holders in eNAM platform, there is a need to provide proper non-monetary incentive to farmers in terms of creation of awareness along with monetary incentives to brand flagship programme called eNAM.

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(An Autonomous Organization of Ministry of Agriculture and Farmers' Welfare, GoI)

Kota Road, Bambala, Pratap Nagar, Jaipur-302 033, Rajasthan.
E-mail: dgniam@hotmail.com | Website: www.ccsniam.gov.in



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