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An analysis of e-trading in India

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Abstract

Agricultural marketing plays an important role in ensuring efficient price discovery and market access for farmers. However, the traditional system in India has been affected by fragmented markets, the dominance of intermediaries and limited transparency. To overcome these challenges, the Government of India launched the e-trading platform, e-NAM in 2016 as a unified digital trading platform by integrating APMCs across the country. The present study analysed the e-trading from the secondary data collected from the e-NAM portal and SFAC annual reports. The findings revealed that 1,522 markets were covered under e-trading, accounting for 21.41 per cent of the total regulated markets in India, and a total of 247 commodities were covered under e trading. Out of 183.30 lakh stakeholders registered, farmers constituted the highest participation (179.40 lakhs), followed by traders (26.80 lakhs), commission agents (11.60 lakhs), and 4,589 Farmer-Producer Organizations (FPOs). Participation of stakeholders was largely observed in a few states, such as Uttar Pradesh, Madhya Pradesh and Haryana, while many other states showed less participation, indicating uneven adoption of stakeholders across different regions. The volume and value of agricultural commodities traded, has registered a significant growth rate of 16.40 and 23.87 per cent, respectively, during 2016-17 to 2024-25. However, inter-mandi and inter-state trade remained limited relative to intra-mandi transactions and few states were found participating in inter-mandi and interstate trade, indicating that the objective of a unified national market has not yet been fully achieved. The study revealed that though e-trading has improved transparency and efficiency in agricultural marketing, creating awareness through training and capacity-building programs for wider participation of stakeholders, infrastructure development, and policy support are required to improve the efficiency of the agricultural marketing system and for better price realisation by the farmers in India.

Keywords: e-NAM, e-trading, agricultural marketing, price discovery

Introduction

Electronic trading (e-trading) refers to the buying and selling of goods and services through online platforms using the internet and digital technologies. It first emerged in the financial sector with computerized trading systems and later expanded to other sectors due to advancements in information and communication technology (ICT). The growth of e-commerce during the 1990s further promoted e-trading by improving transparency, reducing transaction costs and enabling faster exchange of market information (Kotler and Keller, 2012) [10]. The success of e-trading in financial and commercial sectors encouraged its adoption in agricultural marketing systems. Agricultural commodity marketing serves as a key link between the farm sector and the broader economy by enabling the efficient transfer of produce from farmers to consumers. It provides a structured system where buyers and sellers interact, making agricultural markets essential platforms for trade. However, the stakeholders in the agricultural marketing system often have differing interests, leading to price distortions and unequal distribution of market power, thereby reducing

market efficiency (Acharya S. S. & Agarwal N. L., 2011) [1]. To protect the farmers from malpractice and ensure fair trade practices, state governments in India introduced the Agricultural Produce Market Committee (APMC) Acts from the 1950s onwards. The regulations were implemented to provide farmers with remunerative prices, ensure the smooth flow of reliable market information, enforce standardized rules and procedures, reduce market uncertainties, and enhance the overall efficiency of the agricultural marketing system (Singh *et al.* 2022; Kumar *et al.* 2024) [16, 9]. In spite of government efforts, still the agricultural marketing system in India has been marked by several inefficiencies such as fragmented markets, the dominance of intermediaries, lack of transparency, and limited access to competitive pricing. These factors have adversely affected farmers' income and bargaining power, often resulting in lower returns for their produce, leads to overall inefficiencies in the marketing process (Chand, 2016; Reddy 2018; Swain *et al.*, 2022; Jabeen *et al.* 2024) [4, 14, 17, 7]. To overcome these challenges and modernize agricultural marketing, the integration of digital

technologies into agricultural trade became necessary. The use of e-trading in agriculture emerged as an important reform to improve market efficiency, transparency, and price discovery mechanisms. Electronic agricultural trading platforms facilitate online bidding, electronic payments, quality-based trading, and wider market access for farmers. These systems help in reducing the role of intermediaries and enable farmers to access a larger number of buyers beyond local markets. According to Chand (2016) [4], e-trading enhances competition among buyers and improves price realization for farmers by integrating agricultural markets through digital platforms.

As part of the reform, the Government of India introduced e-trading through the electronic National Agriculture Market (e-NAM) platform on 14th April 2016, a digital initiative to integrate the country's wholesale markets (APMCs) into a unified online platform (Bisen and Kumar, 2018) [3]. The National Agriculture Market (e-NAM) was entirely funded by the Central Government and is carried out by the Small Farmers Agribusiness Consortium (SFAC) under the Ministry of Agriculture and Farmers Welfare. The concept behind the e-Platform for the National Agricultural Market (e-NAM) originated with the unified online agricultural market, but it was a physical market at the back end. The primary objective of e-NAM is to facilitate transparent price discovery based on the demand and quality of the produce, promote competitive online bidding, reduce the role of middlemen, information asymmetry and expand market access for farmers beyond their local mandis, ensuring instant online payment (Chand, 2016; NITI Aayog, 2020) [4, 11]. It also provides all the information on prices, arrivals and trade offers for available commodities. By enabling these activities, e-NAM can strengthen marketing efficiency, potentially increases the farmers income through fair prices for their produce. The implementation of the e-NAM also represents a significant step towards the digital transformation of agricultural marketing in India. It supports the vision of "One Nation, One Market" by promoting inter-state and inter-mandi trade, thereby reducing regional disparities in agricultural markets. In India, during the launch of e-NAM in 2016, 21 APMCs from eight states were linked to the e-NAM portal. Since its inception, e-NAM has expanded considerably in terms of markets coverage and stakeholder participation. Currently, in 2025, a total of 1,522 APMCS have been integrated under e-NAM across 23 states and 4 UTs, serving 179.41 lakh farmers, 2.67 lakh traders, 1.16 lakh commission agents, 4,518 FPOs, and 79 service providers, indicating its growing adoption across the country (Parmar and Bansal, 2025) [13]. The platform has also facilitated the trading of a wide range of agricultural commodities and contributed to increased transparency and efficiency in the marketing process. In this context, the present study was undertaken to assess the e-trading through the e-NAM platform in India across different states, to know the overall growth of e-trading, including markets and commodities covered under e-trading, variation in participation of different stakeholders,

and growth in trading of the agricultural commodities.

Methodology

The present study was based on secondary data collected from the official e-trading portal, SFAC annual reports, and the Ministry of Agriculture and Farmers' Welfare annual reports to analyse the e-trading through the e-NAM platform in India. The data included information on the number of APMCs and mandis integrated under e-NAM, commodities traded, stakeholder participation, such as the number of registered farmers, traders, commission agents, and Farmer-Producer Organizations (FPOs), and the volume and value of agricultural commodities traded from 2016-17 to 2024-25, along with inter-mandi and inter-state trade data from 2019-20 to 2024-25. Descriptive statistical techniques, such as averages, percentages, and the Compound Annual Growth Rate (CAGR), were employed to analyse the collected data.

Compound Annual Growth Rate (CAGR)

To analyse growth trends in the volume and value of quantity traded in e-trading (e-NAM), the compounded annual growth rates were worked out for the period 2016-17 to 2024-25 using the following formula.

$$Y_t = ab^t e^u$$

Log transformation of the above function is

$$\ln Y_t = \ln a + t (\ln b) + u$$

$$\ln b = \ln (1+r)$$

$$b = 1+r, r = b - 1 \text{ and } r = [\text{Antilog} (\ln b) - 1]$$

The compound growth rates were calculated by using the formula

$$\text{CGR} (\%) = r \times 100$$

Where, Y^t = volume of quantity traded, value of quantity traded t , t = Time variable,

a = Constant, u = error term, $\ln b$ = Regression coefficient of time, r = CGR

The significance of these compound growth rates was tested at 1 per cent, 5 per cent, and 10 per cent levels of significance.

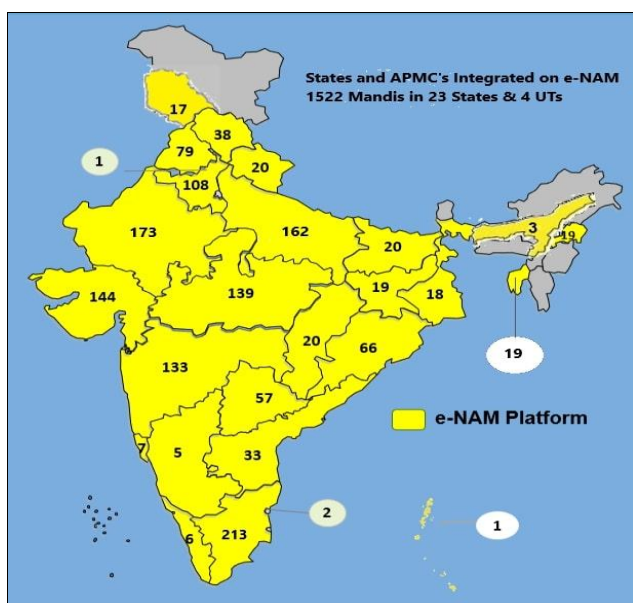
Results and Discussion

The distribution of state-wise markets covered under e-trading through the National Agriculture Market (e-NAM) platform from 2016 to 2025 is presented in Table 1 and Fig. 1. The results found that, across the country, out of 7,110 APMCs, only 1,522 markets are covered under the e-NAM platform, accounting for 21.41 per cent, reflecting a moderate level of coverage.

Table 1: Distribution of state-wise markets covered under e-trading as on June 2025

S. No.	Name of State/UT	Total number of APMCs	Markets covered under e-NAM	% Coverage of markets under e-NAM
1	Andhra Pradesh	323	33	10.19
2	Assam	226	3	1.33
3	Chhattisgarh	190	20	10.53
4	Goa	8	7	87.50
5	Gujarat	415	144	34.70
6	Haryana	296	108	36.49
7	Himachal Pradesh	71	38	53.52
8	Jharkhand	201	19	9.45
9	Karnataka	527	5	0.95
10	Madhya Pradesh	556	139	25.00
11	Maharashtra	929	133	14.32
12	Nagaland	114	19	16.67
13	Odisha	535	66	12.34
14	Punjab	437	79	18.08
15	Rajasthan	446	173	38.79
16	Tamil Nadu	288	213	73.96
17	Telangana	284	57	20.07
18	Tripura	21	19	90.48
19	Uttar Pradesh	633	162	25.59
20	Uttarakhand	62	20	32.26
21	West Bengal	537	18	3.35
Union Territory (UT)				
1	Andaman And Nicobar Islands	1	1	100.00
2	Chandigarh	1	1	100.00
3	Jammu And Kashmir	25	17	68.00
4	Puducherry	8	2	25.00
Total		7110	1522	21.41

Source: e-nam.gov.in

**Fig 1:** States mandies covered under e-NAM in India

The results found that the Tripura state has the highest number of markets 19 out of 21 covered under e-trading through the e-NAM platform, accounting for 90.48 per cent, followed by Goa 7 out of 8 markets, accounting for 87.50 per cent and in Tamil Nadu 213 out of 288 accounting for 73.96 per cent of total markets. The 38 markets out of 71 in Himachal Pradesh (53.52%), 173 out of 443 in Rajasthan (38.79%), 108 out of 296 in Haryana (36.49%), 144 out of 415 in Gujarat (34.70%), and 20 out of 62 in Uttarakhand (32.26%) showed moderate levels of adoption. In Uttar

Pradesh 162 out of 633 markets accounting for 25.59 per cent, 139 out of 556 in Madhya Pradesh (25.00%), 57 out of 284 in Telangana (20.07%), 79 out of 437 in Punjab 18.08%, 19 out of 114 in Nagaland (16.67%), 133 out of 929 in Maharashtra (14.32%), 66 out of 535 in Odisha (12.34%), 20 out of 190 in Chhattisgarh (10.53%) and 33 out of 323 in Andhra Pradesh (10.19%) exhibited relatively lower coverage. The lowest levels of coverage of markets were observed in 19 markets out of 201 in Jharkhand, accounting for 9.45 per cent, 18 out of 537 in West Bengal (3.35%), 3 out of 226 in Assam (1.33%) and 5 out of 527 in Karnataka (0.95%). In case of Union Territories complete coverage of markets was observed in Andaman and Nicobar Islands and Chandigarh, 100.0 per cent each, whereas in Jammu and Kashmir 17 markets out of 25 accounting for 68.0 per cent, and 2 markets out of 8 in Puducherry accounting for 25.0 per cent.

Category-wise (commodities) traded under e-trading through the e-NAM platform

Table 2: Category-wise distribution of commodities traded under e-NAM as on June 2025

S. No.	Type of commodities	Number of commodities	% distribution of commodities
1	Food Grains/ Cereals	38	15.38
2	Oilseeds	14	5.67
3	Spices	17	6.88
4	Fruits	48	19.43
5	Vegetables	59	23.89
6	Other commodities	71	28.74
Total		247	100.00

Source: e-nam.gov.in

The Electronic National Agriculture Market (e-NAM) enables the trading of a wide variety of agricultural commodities across integrated markets in India and the commodities are broadly classified. The category-wise distribution of commodities traded under e-trading through the e-NAM platform across different markets are presented in Table 2. From 2016-17 to 2024-25, a total of 11.47 crore metric tonnes of all agricultural commodities were traded through the e-NAM platform, with a total trade value of Rs 4.20 lakh crore. According to the study by Arpitha *et al.* (2025) ^[2], there has been a substantial upward trend in commodity-wise trading volume on the e-NAM platform. It is observed that from 2016 to 2025, 247 commodities were traded under the e-NAM platform, out of which the vegetables (59) found to be maximum number of commodities traded, accounting for 23.89 per cent followed by 48 types of commodities in fruits (19.43%), 38 in food Grains/Cereals (15.38%), 17 in spices (6.88%), 14 in oilseeds (5.67%) and other 71 commodities which are not under the above categories accounting for 28.74 per cent. Similar results were reported by Rede and Ingle (2021) ^[15] and Nimbrayan *et al.* (2024) ^[12].

Participation of Stakeholders under e-trading through the e-NAM platform in India

In the e-trading system, various stakeholders perform specific roles that collectively contribute to the efficient functioning of agricultural markets. Farmers play the primary role as producers by bringing their agricultural produce to the market for sale and benefiting from better price discovery through e-trading platforms. Traders participate in the buying process by bidding for produce, thereby ensuring competition and efficient price determination. Commission agents act as intermediaries who facilitate transactions between farmers and traders, assist in documentation and provide market-related support services. Farmer-Producer Organizations (FPOs) help aggregate produce from farmers, strengthen their bargaining power, and enable better access to markets and e-trading platforms. Market officials are responsible for regulating market activities, supervising transactions, maintaining transparency, and ensuring the smooth functioning of e-trading operations. The stakeholders must be registered under e-trading for trading purposes. The distribution of state-wise registered different stakeholders' participation is represented in Table 3 and Figure 2.

Table 3: Distribution of state-wise stakeholders' participation under e-trading (e-NAM) in India as on June 2025

S. No.	Name of State/UT	Farmers (Lakh)	Traders	Commission Agents	FPOs	Total Stakeholders (Lakh)
1	Uttar Pradesh	33.05 (18.42)	40090 (14.98)	8574 (7.39)	399 (8.69)	33.54 (18.30)
2	Madhya Pradesh	30.25 (16.86)	25930 (9.69)	0	224 (4.88)	30.51 (16.65)
3	Haryana	27.27 (15.20)	17570 (6.56)	30486 (26.27)	269 (5.86)	27.76 (15.14)
4	Telangana	18.24 (10.16)	6363 (2.38)	5161 (4.45)	208 (4.53)	18.36 (10.01)
5	Rajasthan	15.485 (8.63)	86873 (32.45)	27618 (23.80)	350 (7.63)	16.63 (9.07)
6	Andhra Pradesh	14.54 (6.99)	3882 (1.45)	2364 (2.04)	324 (7.06)	14.61 (7.97)
7	Maharashtra	12.41 (4.84)	23376 (8.73)	18368 (15.83)	355 (7.74)	12.84 (7.00)
8	Gujarat	8.69 (8.10)	10283 (3.84)	7189 (6.20)	288 (6.28)	8.88 (4.84)
9	Tamil Nadu	4.67 (2.60)	12552 (469)	0	283 (6.17)	4.80 (2.62)
10	Odisha	4.57 (2.54)	10090 (3.77)	0	511 (11.14)	4.68 (2.55)
11	Jharkhand	2.67 (1.49)	2546 (0.95)	0	240 (5.23)	2.70 (1.47)
12	Punjab	2.17 (1.21)	3563 (1.33)	10856 (9.36)	21 (0.46)	2.32 (1.27)
13	Chhattisgarh	1.36 (0.75)	3703 (1.38)	255 (0.22)	58 (1.26)	1.40 (0.76)
14	Himachal Pradesh	1.25 (0.70)	2331 (0.87)	1159 (1.00)	99 (2.16)	1.29 (0.71)
15	West Bengal	0.99 (0.55)	5738 (2.14)	125 (0.11)	329 (7.17)	1.05 (0.58)
16	Uttarakhand	0.92 (0.02)	6200 (2.32)	2721 (2.34)	116 (2.53)	1.01 (0.55)
17	Bihar	0.05 (0.02)	1004 (0.38)	0	225 (4.90)	0.06 (0.04)
18	Kerala	0.03 (0.01)	444 (0.17)	0	48 (1.05)	0.04 (0.02)
19	Karnataka	0.01 (0.009)	833 (0.31)	847 (0.73)	30 (0.65)	0.03 (0.02)
20	Nagaland	0.002	181	0	1	0.004

		(0.001)	(0.07)		(0.02)	(0.002)
21	Assam	0.001 (0.001)	8 (0.00)	0	66 (1.44)	0.002 (0.001)
22	Tripura	0.001 (0.0004)	65 (0.02)	0	5 (0.11)	0.001 (0.001)
23	Goa	0.0003 (0.0002)	982 (0.37)	0	5 (0.11)	0.01 (0.01)
Union Territory (UT)						
1	Andaman And Nicobar Islands	0.00004 (0.00002)	4 (0.00)	0	3 (0.07)	0.0001 (0.0001)
2	Chandigarh	0.071 (0.04)	121 (0.05)	119 (0.10)	0	0.07 (0.04)
3	Jammu And Kashmir	0.520 (0.29)	2747 (1.03)	200 (0.17)	128 (2.79)	0.55 (0.30)
4	Puducherry	0.136 (0.07)	232 (0.09)	0	4 (0.09)	0.14 (0.08)
	Total	179.41 lakh	26.8 lakh	11.60 lakh	4,589	183.30 lakh

Source: e-nam.gov.in

State-wise participation of farmers under e-trading

The state-wise participation of farmers under e-trading through the e-NAM platform were presented in the table 3. The results revealed that, as on 2025, a total of 179.42 lakh farmers were registered and participated in the e-NAM system. Out of that, Uttar Pradesh state was found to have the highest participation with 33.05 lakh farmers, accounting for 18.42 per cent of the total, followed by 30.25 lakh of farmers in Madhya Pradesh (16.86%), 27.27 lakh of farmers in Haryana (15.20%) and 18.24 lakh farmers in Telangana (10.17%), indicating substantial progress in the adoption of e-NAM scheme. The moderate level of 15.48 lakh farmer participation was observed in Rajasthan (8.63%), followed by 14.54 lakh farmers in Andhra Pradesh (8.11%), 12.42 lakh farmers in Maharashtra (6.92%), 8.70 lakh farmers in Gujarat (4.85%), 4.67 lakh farmers in Tamil Nadu (2.60%), 4.57 lakh farmers in Odisha (2.55%). Jharkhand and Punjab show relatively lower participation, with 2.67 lakh farmers accounting for 1.49 per cent and 2.18 lakh farmers accounting for 1.21 per cent, respectively. Chhattisgarh and Himachal Pradesh contribute 1.36 lakh farmers (0.76%) and 1.26 lakh farmers (0.70%), respectively. In West Bengal 0.99 lakh farmers participated, accounting for 0.55 per cent of the total. The remaining states and four Union Territories in the country together constitute 1.75 lakh farmers participated, accounting for 0.98 per cent, reflecting relatively low participation and similar results were reported by Jainuddin *et al.* 2025 ^[8]. Overall, the findings indicate that farmer participation in e-trading is concentrated in a few leading states, while several states continue to show lower adoption levels, emphasizing the need for further expansion and strengthened awareness initiatives.

State-wise participation of traders under e-trading

The state-wise distribution of registered traders' participation under e-trading through the e-NAM platform were presented in the table 3. The results revealed that, as on 2025, a total of 2.68 lakh traders were registered under the e-NAM platform. Out of that, Rajasthan found to have the highest participation with 86,873 traders, accounting for 32.45 per cent of the total, followed by 40,090 traders in Uttar Pradesh (14.97%), 25,930 traders in Madhya Pradesh

(9.69%). 23,376 traders in Maharashtra (8.73%), 17,570 traders in Haryana (6.56%), 12,552 traders in Tamil Nadu (4.69%). The moderate level of trader participation was observed in Gujarat and Odisha contributed 10,283 (3.84%) and 10,090 (3.77%) traders, respectively, 6,371 traders in Telangana (2.38%), 6,200 traders in Uttarakhand (2.32%), 5,738 traders in West Bengal (2.14%), 3,882 traders in Andhra Pradesh (1.45%). Chhattisgarh, Punjab and Jammu and Kashmir showed relatively lower participation with 3,703 (1.38%), 3,563 (1.33%), and 2,747 (1.03%) traders, respectively. In contrast, the remaining states and four Union Territories together accounted for 8,751 traders (3.2%), reflecting a relatively low level of participation, similar results were reported by Hiremath *et al.* (2021) ^[6].

State-wise participation of commission agents under e-trading

The state-wise participation of registered commission agents under e-trading through the e-NAM platform was presented in Table 3. The results found that, as on 2025, a total of 1.16 lakh commission agents were registered on the e-trading (e-NAM) platform. Out of that, 30,486 commission agents in Haryana was found to have the highest participation, accounting for 26.27 per cent followed by 27,618 in Rajasthan (23.80%), 18,368 in Maharashtra (15.83%), 10,856 in Punjab (9.36%), 8,574 in Uttar Pradesh (7.39%), 7,189 in Gujarat (6.20%), 5,161 in Telangana (4.45%), 2,721 in Uttarakhand (2.34%), 2,364 in Andhra Pradesh (2.04%), 1,159 in Himachal Pradesh (1.00%), 847 in Karnataka (0.73%), 255 in Chhattisgarh (0.22%), 200 in Jammu and Kashmir (0.17%), 119 in Chandigarh (0.10%) and 125 in West Bengal (0.11%). Overall, the findings indicate that commission agents' participation in e-NAM was limited to 13 states and 2 Union Territories in the country and there was less participation as compared with traders.

State-wise participation of FPOs under e-trading

The state-wise FPOs participation under e-trading through the e-NAM was presented in the table 3. The results observed that, as on 2025, a total of 4,518 FPOs were registered under the e-NAM platform. Out of that, 511 FPOs registered in Odisha accounting for 11.14 per cent were

found to have the highest participation, followed by 399 in Uttar Pradesh (8.69%), 355 in Maharashtra (7.74%), 350 in Rajasthan (7.63%), 329 in West Bengal (7.17%), 324 in Andhra Pradesh (7.06%), 288 in Gujarat (6.28%), 283 in Tamil Nadu (6.17%), 269 in Haryana (5.86%), 240 in Jharkhand (5.23%), 225 in Bihar (4.90%), 224 in Madhya Pradesh (4.88%) and 208 in Telangana (4.53%). Further, it was also found that 128 FPOs in Jammu and Kashmir (2.79%), 116 in Uttarakhand (2.53%), 99 in Himachal Pradesh (2.16%), 66 in Assam (1.44%), 58 in Chhattisgarh (1.26%), 48 in Kerala (1.05%) and 30 in Karnataka (0.65%). The remaining states and Union Territories together 39 FPOs, accounting for 1.00 per cent. Overall, the findings indicate that FPO participation under e-NAM is fairly distributed across several states, though a few states account for a relatively higher share, while others show comparatively lower participation levels than other stakeholders.

The study also further observed that Uttar Pradesh state was found to have the highest participation of total stakeholders 33.54 lakh, accounting for 18.30 per cent, followed by 30.51 lakh stakeholders in Madhya Pradesh (16.65%), 27.76 lakh in Haryana (15.14%). 18.36 lakh in Telangana (10.01%),

16.63 lakh in Rajasthan (9.07%), 14.61 lakh in Andhra Pradesh (7.97%), 12.84 lakh in Maharashtra (7.00%), 8.88 lakh in Gujarat (4.84%), 4.80 lakh in Tamil Nadu (2.62%), 4.68 lakh in Odisha (2.55%). The remaining states and Union Territories contributed relatively smaller shares to the total stakeholder participation. The overall findings revealed that 183.30 lakh stakeholders participated in e-trading through the e-NAM platform, out of which 179.4 lakh of farmers (97.87%) was found to have the highest participation for trading their produce, followed by 26.8 lakh traders (1.46%), 11.60 lakh commission agents (0.63%), and 4,589 FPOs (0.02%). The distribution of participation of stakeholders indicates that states such as Uttar Pradesh, Madhya Pradesh, and Haryana represent a substantial share among all the states in the country, while other states and Union Territories exhibit relatively low participation levels. This indicates that although farmers constitute the main participants under this platform, the participation of other stakeholders is relatively lower and varies across regions. Therefore, improving awareness, strengthening institutional support, and encouraging balanced participation across all stakeholder groups are essential to enhance the effectiveness of the e-NAM system.

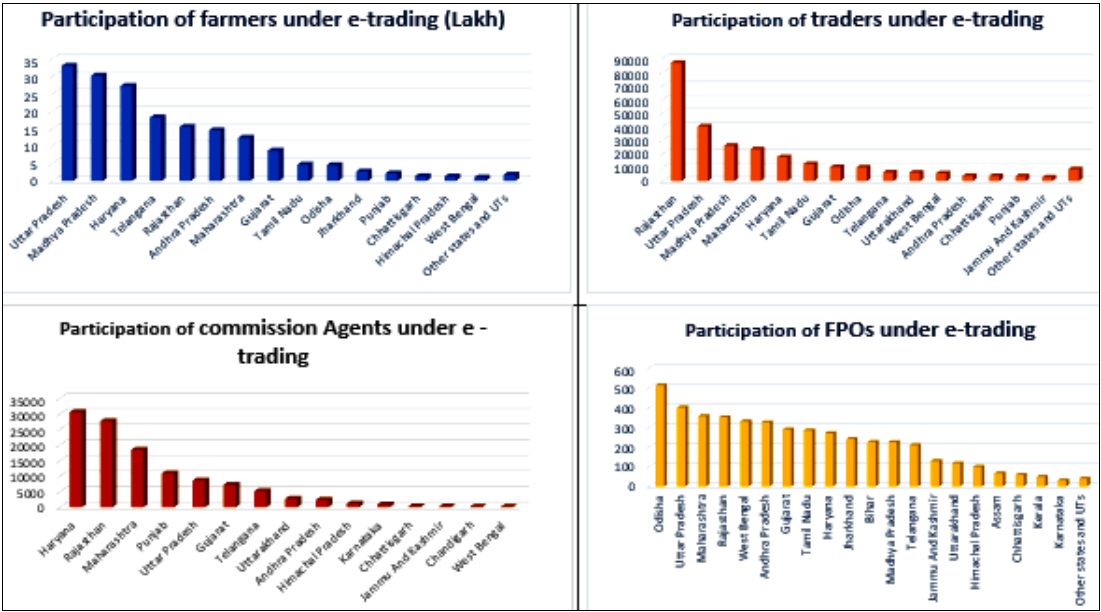


Fig 2: State-wise participation of different stakeholders under e-trading (e-NAM) in India

Volume and value of agricultural commodities e-trading (e-NAM) in India

The growth trends in the volume and value of all agricultural commodities traded under e-trading through the National Agriculture Market (e-NAM) platform across all states in India from 2016-17 to 2024-25 were presented in the table 4. It is observed that the volume of quantity traded was increased from 0.55 Cr MT in 2016-17 to 2.04 Cr MT in 2024-25. Similarly, the value of quantity traded was also increased from 0.14 lakh Cr in 2016-17 to 4.20 lakh Cr in 2024-25. The growth rates of volume and value of quantity traded through the e-NAM platform in India were found to be 16.40 and 23.87 per cent, respectively, and were positive and highly significant at the one per cent level. This indicates a substantial and consistent increase in both the volume of commodities traded and the overall monetary

value of transactions carried out through this platform during the study period. Thus, it was concluded that both the volume and value of agricultural commodities traded through this platform have shown strong, statistically significant growth over the period, reflecting the effective expansion and adoption of e-NAM at the national level. The volume and value of all agricultural commodities traded through the e-NAM are shown in fig 3.

Table 4: Growth in volume and value of quantity traded under e-trading (e-NAM) in India

Period	Particulars	CAGR (%)
2016-17 to 2024-25	Volume of quantity traded	16.40***
	Value of quantity traded	23.87***

Note: *** Significant at 1% level of probability **Significant at 5% level of probability, * Significant at 10% level of probability.

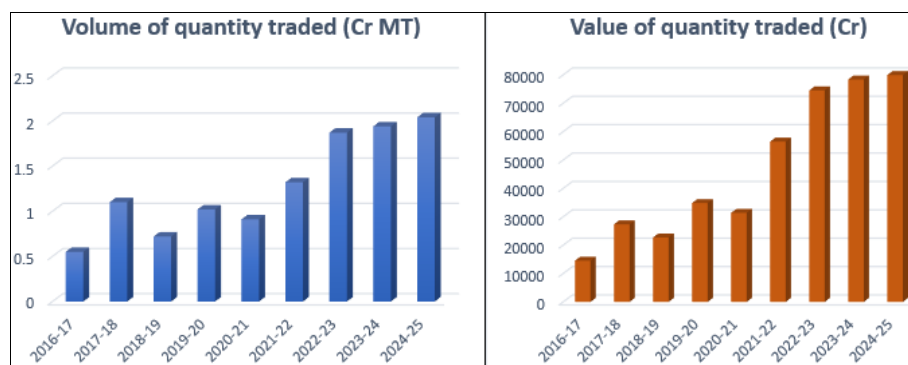


Fig 3: Volume and value of agricultural commodities traded through e-NAM in India

Details of inter-mandi and inter-state trade under e-trading (e-NAM) in India

Inter-mandi and inter-state trade through the e-NAM platform was an important component in achieving the broader objectives of agricultural e-trading in India. Inter-mandi trade refers to the trading of agricultural commodities between different mandis within the same state through the e-NAM platform. Whereas, inter-state trade refers to the exchange of agricultural commodities between mandis located in different states through the e-NAM platform. Therefore, this inter-mandi and inter-state trade enhances competition, improve price discovery, reduced the need for intermediaries and the influence of local market imperfections. This market integration helps farmers access a wider pool of buyers, and it leads to better price realization and reduce the dependency on local

intermediaries. The trade details of inter-mandi and inter-state e-trading (e-NAM) were presented in tables 5 and 6. It is observed that the total volume of quantity traded through the e-NAM platform in India has increased from 102.89 lakh tonnes in 2019-20 to 209.70 lakh tonnes in 2024-25, making a total of 926.41 lakh tonnes. Of which, 98.23 per cent was traded within the mandi, while inter-mandi and inter-state trade accounted for 1.72 per cent and 0.03 per cent respectively. During 2019-20 to 2024-25, the volume of intra-mandi trade has increased from 102.0 to 204.0 lakh tonnes, while inter-mandi trade has increased from 0.71 to 5.67 lakh tonnes and inter-state trade has increased from 0.01 to 0.17 lakh tonnes. Thus, intra-mandi traded volume was found to be highest than inter-mandi and inter-state trade.

Table 5: Volume of inter-mandi and inter-state traded under e-trading (e-NAM) in India

Year	Total volume of quantity traded (Lakh Tonnes)	Volume of intra-mandi traded (Lakh Tonnes)	Volume of Inter-mandi (Lakh Tonnes)	Volume of Inter-state (Lakh Tonnes)
2019-20	102.89	102.0	0.71	0.01
2020-21	91.71	91.0	0.69	0.02
2021-22	133.75	132.0	1.75	0.01
2022-23	189.43	187.0	2.36	0.07
2023-24	198.91	194.0	4.74	0.17
2024-25	209.70	204.0	5.67	0.03
Total	926.41	910.0 (98.23)	15.93 (1.72)	0.31 (0.03)

Table 6: Value of inter-mandi and inter-state trade under e-trading (e-NAM) in India

Year	Total value of quantity traded (Cr)	Value of intra-mandi (Cr)	Value of Inter-mandi (Cr)	Value of Inter-state (Cr)
2019-20	35,016	34,829	187.3	0.19
2020-21	31,544	31,366	178.1	0.22
2021-22	56,896	56,498	398.1	0.01
2022-23	74,539	74,528	7.23	3.74
2023-24	800,56	78,386	1627.8	42.50
2024-25	81,741	79,950	1769.9	21.05
Total	359793.4	355557 (98.8)	4168.7 (1.2)	67.7 (0.02)

It is observed that the total value of quantity traded through the e-NAM platform in India has increased from 35,016 crores in 2019-20 to 81,741 crores in 2024-25, making a total of 359793.4 crores. Of which, 98.8 per cent of the value of trade was within the mandi, while inter-mandi and inter-state trade accounted for 1.2 per cent and 0.02 per cent

respectively. During 2019-20 to 2024-25, the value of intra-mandi trade has increased from 34,829 to 79,950 crores, while inter-mandi trade has increased from 187.3 to 1769.9 crores and inter-state trade has increased from 0.19 to 21.05 crores. Thus, intra-mandi value of trade was found to be highest than inter-mandi and inter-state trade.

Table 7: State-wise number of mandies participated in inter-mandi trade as on 2024-25

S. No	Name of the State	Number of mandies covered under e-trading (No.)	Mandies participated in the inter-mandi (Avg. No)	Mandies participated in the inter-mandi (%)
1	Andhra Pradesh	33	11.0	33.3
2	Chhattisgarh	20	5.0	25.0
3	Gujarat	144	2.0	1.3
4	Haryana	108	26.0	24.0
5	Jammu and Kashmir	17	6.0	35.2
6	Jharkhand	19	6.0	31.5
7	Karnataka	5	2.0	40.0
8	Kerala	6	3.0	50.0
9	Madhya Pradesh	139	17.0	12.2
10	Maharashtra	133	5.0	3.7
11	Nagaland	19	2.0	10.5
12	Odisha	66	53.0	80.3
13	Rajasthan	173	39.0	22.5
14	Tamil Nadu	213	83.0	38.9
15	Telangana	57	23.0	40.3
16	Uttar Pradesh	162	8.0	4.9
17	Uttarakhand	20	14.0	70.0
18	West Bengal	18	15.0	83.3

The state-wise number of mandies participated in inter-mandi trade through the e-trading (e-NAM) platform as on 2024-25 are presented in the table 7 and fig 4. Seventeen states and one Union Territory participated in inter-mandi trade across the country. The findings revealed that considerable variation among states in terms of the number of e-trading markets and the extent of their participation in inter-mandi trade. It was observed that 213 markets were integrated under e-NAM in Tamil Nadu, out of that on an average 83.0 markets participated under inter-mandi (38.9%), which was the highest among all states, followed by 66 markets out of that only 53.0 markets in Odisha

(80.3%), 39.0 markets in Rajasthan (22.5%), 26.0 markets in Haryana (24.0%), 23.0 markets in Telangana (40.3%), and 17.20 markets in Madhya Pradesh (12.2%), 15.0 markets in West Bengal (83.3%), 14.0 markets in Uttarakhand (70.0%), 11.0 markets in Andhra Pradesh (33.3%), and 8.0 markets in Uttar Pradesh (4.9%), 6.0 markets in Jharkhand (31.5%), 5.0 markets in Maharashtra (3.7%), 6.0 markets in Jammu and Kashmir (35.2%) and 5.0 markets in Chhattisgarh (25.0%). Gujarat (1.39%), Karnataka (40.0%) and Nagaland (10.53%) each reported 2.0 markets.

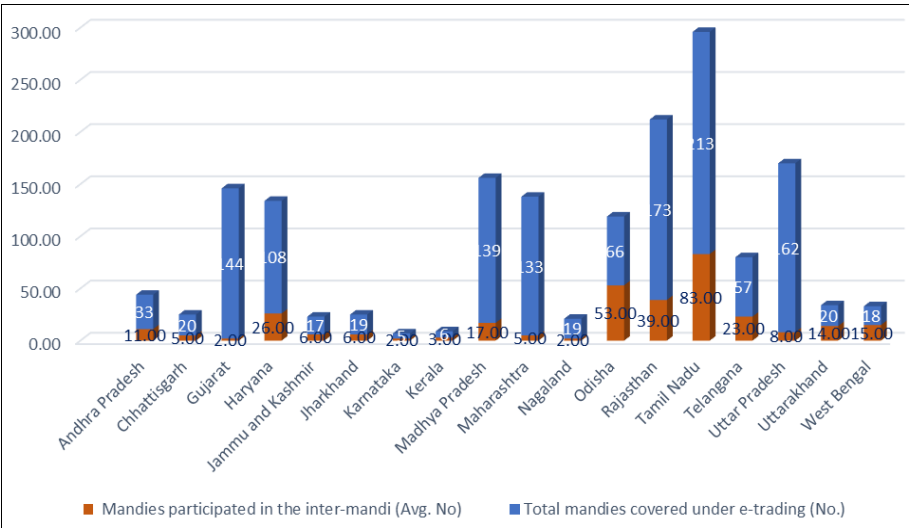


Fig 4: State-wise number of mandies participated in inter-mandi trade

Table 8: State-wise number of mandies participated in inter-state trade as on 2024-25

S. No	Name of the State	Mandies participated in interstate trade (No.)	Traded States
1	Andhra Pradesh	3	Tamil Nadu, Jammu and Kashmir and Maharashtra
2	Bihar	1	Uttar Pradesh
3	Chandigarh	2	Jammu and Kashmir and Maharashtra
4	Chhattisgarh	1	Jammu and Kashmir
5	Gujarat	2	Maharashtra and Jammu and Kashmir

6	Haryana	3	Maharashtra, Uttar Pradesh and Jammu and Kashmir
7	Jammu and Kashmir	1	Punjab
8	Jharkhand	6	Uttar Pradesh, Jammu and Kashmir, Maharashtra, Punjab, Uttarakhand and Bihar
9	Karnataka	2	Maharashtra and Tamil Nadu
10	Kerala	3	Maharashtra, Jammu and Kashmir and Tamil Nadu
11	Madhya Pradesh	3	Rajasthan, Maharashtra and Tamil Nadu
12	Maharashtra	11	Andhra Pradesh, Chandigarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu, Uttar Pradesh and West Bengal
13	Nagaland	1	Maharashtra
14	Odisha	3	Chhattisgarh, Jharkhand and Jammu and Kashmir
15	Puducherry	1	Tamil Nadu
16	Rajasthan	2	Madhya Pradesh and Jammu Kashmir
17	Tamil Nadu	5	Andhra Pradesh, Puducherry, Uttar Pradesh, Maharashtra and Telangana
18	Telangana	2	Andhra Pradesh and Telangana
19	Uttar Pradesh	7	Himachal Pradesh, Uttarakhand, Haryana, Jammu and Kashmir, Tamil Nadu, Assam and Maharashtra
20	Uttarakhand	1	Uttar Pradesh
21	West Bengal	2	Jharkhand and Maharashtra

State-wise participation of number of states participated under inter-state trade through the e-trading (e-NAM) platform in the country was presented in the table 8. The results found that among all the states in the country, Maharashtra found to have highest level of participation in interstate trade, through the e-NAM platform. It was participated with 11 states, namely Andhra Pradesh, Chandigarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Tamil Nadu, Uttar Pradesh and West Bengal, followed by Jharkhand and Uttar Pradesh, each state participating with 7 states were Jharkhand traded with Uttar Pradesh, Haryana, Jammu and Kashmir, Maharashtra, Punjab, Uttarakhand and Bihar, while Uttar Pradesh traded with Himachal Pradesh, Uttarakhand, Jammu and Kashmir, Tamil Nadu, Assam and Maharashtra. The Tamil Nadu state participated with 5 states, namely Andhra Pradesh, Puducherry, Uttar Pradesh, Maharashtra and Telangana. States such as Andhra Pradesh, Haryana, Kerala, Madhya Pradesh and Odisha each participated with 3 states. Andhra Pradesh traded with Tamil Nadu, Jammu and Kashmir, and Maharashtra. Haryana with Maharashtra, Uttar Pradesh, and Jammu and Kashmir. Kerala with Maharashtra, Jammu and Kashmir and Tamil Nadu. Madhya Pradesh with Rajasthan, Maharashtra and Tamil Nadu. Odisha with Chhattisgarh, Jharkhand, and Jammu and Kashmir. Further, Gujarat, Rajasthan, Telangana, Chandigarh, Karnataka and West Bengal each participated with 2 states, while Bihar, Chhattisgarh, Nagaland, Puducherry, Uttarakhand and Jammu and Kashmir participated in interstate trade with only one state each. Overall, the results indicated that a few states have participated under interstate trading linkages, whereas many states exhibit limited participation, so there is a need to strengthen the inter-state trading linkages.

Conclusion

The present study, an analysis of e-trading (e-NAM) in India using secondary data, revealed that 1,522 markets were covered under e-trading, accounting for 21.41 per cent of the total regulated markets in India, and a total of 247 commodities were traded through the e-platform. Around 183.30 lakh stakeholders were registered, of which farmers constitute the highest participation (179.40 lakhs), followed by traders (26.80 lakhs), commission agents (11.60 lakhs),

and 4,589 Farmer-Producer Organizations (FPOs) under this e-trading platform. Participation of stakeholders was largely observed in a few states, such as Uttar Pradesh, Madhya Pradesh and Haryana, while many other states showed less participation, indicating uneven adoption of stakeholders across different states. The study further revealed that a significant growth trend in both volume and value of commodities traded at 16.40 per cent and 23.87 per cent, respectively. Among the different states inter-mandi trade, found to be high in Tamil Nadu, Odisha, Rajasthan, Haryana, and Telangana, whereas only four states, namely Maharashtra, Uttar Pradesh, Jharkhand, and Tamil Nadu found participated in interstate trade. Though inter-mandi and inter-state trade was also increasing, but less than the intra-mandi, indicating that the objective of a unified national market has not been fully achieved. Thus, the study concluded that increasing awareness through training and capacity-building programs, strengthening institutional support, and encouraging wider participation across all stakeholder groups are essential for improving the effectiveness of the e-trading system.

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