

Chapter: 14

DIGITALIZING AGRICULTURE FOR INDUSTRIAL ADVANCEMENT: EXPLORING FARMERS' PARTICIPATION IN E-NAM, PUNJAB, INDIA

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ABSTRACT

The Government of India launched electronic National Agriculture Market (e-NAM) trading portal for marketing of agricultural commodities on 14th April, 2016 which networks the existing APMCs to create a unified national market for agricultural commodities. The present study is an attempt to understand the level of farmers' awareness and motivational factors to participate in e-NAM. Exploratory research design was employed for the study. The primary data was collected from 50 farmers in Mansa APMC of Punjab, India. The study found that the average age of the farmers was 45 years, majority (52.00%) were illiterate, average family size was 7.56 members and nuclear family size was 52%. Nearly 56% of farmers were aware of e-NAM, while awareness percentages for specific features were lower: registration at gate-entry (18%), lot IDs (42%), assaying process (50%), online bidding (52%), inter-state bidding (48%), and online money transfer (8%). These findings indicate knowledge gaps among farmers, emphasizing the need for improved awareness and education on these aspects of e-NAM. With respect to the motivational factors the study found that 32% of respondents were motivated by immediate cash after sale, 32% considered better infrastructure as a key factor, 22% were driven by the desire for remunerative prices, and 14% found the elimination of middlemen to be influential. To promote wider participation and uptake of e-NAM APMC, it is crucial to address farmers' awareness gaps and improve their understanding of specific features. Additionally, efforts should be made to ensure timely payments, enhance infrastructure, and provide opportunities for farmers to obtain competitive prices. By addressing these factors, e-NAM APMC can effectively support farmers in maximizing their economic well-being and contribute to the overall development of the agricultural sector.

Keywords: e-NAM, agricultural marketing, APMC, awareness.



1. INTRODUCTION

The agricultural sector holds a crucial position in the Indian economy, making significant contributions and generating employment opportunities in rural areas (Siddayya et al., 2016). Besides meeting the food requirements of a growing population, agriculture serves as a vital source of raw materials for industries like textiles, sugar, and food processing (Sharma & Patil, 2018). The Impact of Artificial Intelligence in Smart Farming' by Rawat, N., & Kumar, V. (2023). By collectively exploring the implementation of digital platforms and the integration of artificial intelligence in agriculture, these studies contribute to our understanding of how technology-driven advancements are shaping the future landscape of farming, both at the grassroots level in Punjab and on a broader scale. Several factors influence the growth of this sector, including changing climatic conditions, adoption of modern farming methods, access to

reliable markets, and adequate infrastructure (Chaitra et al., 2020). The increasing urban population has also led to a decline in the availability of high-quality food (Beniwal and Patil, 2022). Presently, the agricultural sector faces numerous challenges such as a shortage of labor, climatic factors, marketing issues, and storage problems (Patil et al., 2020). Ensuring fair and transparent prices for agricultural commodities, the agricultural commodity markets play a vital role (Patil and Banakar, 2014). The agricultural sector has evolved beyond its conventional roles of producers and consumers, embracing a diverse range of stakeholders who actively participate in the industry and contribute to the economy (Mahto and Patil, 2023). To benefit the farming community, the Government of India has implemented various initiatives in agricultural marketing, including the electronic-National Agriculture Market (e-NAM) (Dharavath et al., 2021).

On April 14, 2016, the Government of India launched E-NAM, an electronic trading portal that covers agricultural markets nationwide. Initially, it encompassed 21 Agricultural Produce Market Committees (APMCs) in 8 states. Since then, it has expanded its reach, now encompassing 1361 APMCs in 23 states and 4 union territories. E-NAM plays a crucial role in enhancing transparency and efficiency in the agricultural marketing system. It offers real-time price discovery, quality testing, and a secure payment system, effectively reducing transaction costs and eliminating the dependence on intermediaries. Serving as an online trading platform for agricultural commodities in India, E-NAM facilitates seamless trading for farmers, traders, and buyers. It promotes better price discovery and provides a smooth marketing channel for agricultural produce.

As of April 2023, the e-NAM platform has been implemented in 79 Agricultural Produce Market Committees (APMCs) in the state of Punjab. Within Punjab, a total of 2,697 traders, 8,843 commission agents, 2 service providers, 13 Farmer Producer Organizations, and approximately 2.17 lakh farmers have registered on the e-NAM portal for trading agricultural commodities. Punjab joined the e-NAM initiative in April 2018, although the deadline for making all mandis live on the e-NAM portal was missed. Currently, farmers who sell wheat and paddy at the Minimum Support Price (MSP) to the government are not enrolled in the e-NAM platform in Punjab. However, farmers engaged in the cultivation of basmati rice, cotton, maize, green peas, potato, kinnow, and greengram are enlisted under e-NAM (economictimes.indiatimes.com). Presently, intra-mandi trade primarily takes place in Punjab, with the potential for inter-mandi and inter-state trade in the future, depending on the successful functioning of e-NAM within the state. The introduction of e-NAM in select APMCs in Punjab in 2018 has made it a new system for farmers and other stakeholders. The study is an attempt to understand the farmers awareness about the e-NAM and motivational factors which influence to

participate in e-NAM.

2. RESEARCH METHODOLOGY

Mansa Agricultural Produce Market Committee (APMC) in Punjab (India) was selected for the study. Exploratory research design was employed for the study. Simple random sampling method was used and a sample of 50 farmers were selected for the study. The collected data were organized in line with the stated objectives and analyzed using measures such as mean, percentage and graphical representations.

3. RESULTS AND DISCUSSIONS

The table 1 presents the socio-economic characteristics of the farmers participating in the study. The sample consisted of 50 farmers with an average age of 45.33 years. The majority of the farmers (52%) were illiterate, followed by those with primary (24%) and secondary education (18%). Only a small percentage (6%) had completed their undergraduate education. The average family size was 7.56 members, and most of the farmers (62%) belonged to nuclear families. All the respondents were primarily engaged in agriculture, and the average annual income was Rs. 45,000/-. These socio-economic characteristics provide insights into the profile of the farmers involved in the study, highlighting the importance of user-friendly digital platforms like e-NAM for farmers with limited education levels and the potential impact on their economic well-being.

Table 1: Socio-economic characteristics of the farmers

S. No.	Particulars	Units	Details
1	Number of farmers	Number	50.00
2	Average age of famers	Year	45.33
3	Education		
	1. Illiterate		52.00
	2. Primary education		24.00
	3. Secondary education	Per cent	18.00
	4. Under-Graduate		06.00
4	Average Family Size	Number	7.56
5	Family Type		
	1. Joint	Per cent	38.00
	2. Nuclear		62.00
6	Occupation		
	1. Agriculture	Per cent	100.00
	2. Subsidiary		00.00
7	Average Annual Income	Rs.	45000/-

Table 2 presents the distribution of farmers in terms of their awareness levels regarding different aspects of the electronic National Agriculture Market (e-NAM). The highest level of awareness was observed regarding farmers' awareness about e-NAM, with 56.00 percent of farmers reporting knowledge about this electronic agricultural market platform. This indicates that a majority of the surveyed farmers are familiar with the existence and purpose of e-NAM, highlighting the potential for widespread adoption and utilization of the platform. In terms of specific aspects within e-NAM, the lowest level of awareness was found regarding online transfer of money into their bank account in e-NAM, with only 8.00 percent of farmers reporting awareness of this feature. This suggests that a significant proportion of farmers are not fully aware of the convenience and benefits offered by e-NAM in terms of seamless and secure online transfer of funds directly into their bank accounts. Enhancing farmers' understanding of this aspect is crucial to ensure they can fully leverage the financial advantages provided by e-NAM. The other aspects of e-NAM garnered varying levels of awareness among farmers. Farmers' awareness about registration at the gate-entry was reported by 18.00 percent of farmers, indicating a relatively lower level of familiarity with the registration process required to access the e-NAM platform. Similarly, farmers' awareness about the lot IDs for their produce received recognition from 42.00% of farmers, suggesting that a considerable proportion of farmers may still need additional information or guidance regarding the lot identification process within e-NAM.

Table 2: Farmers' awareness about various aspects of e-NAM

S. No.	Statement	Percentage of farmers
1	Farmers' awareness about e-NAM	56.00
2	Farmers' awareness about registration at the gate-entry	18.00
3	Farmers' awareness about the lot IDs for their produce	42.00
4	Farmers' awareness about assaying process at e-NAM	50.00
5	Farmers' awareness about online bidding process	52.00
6	Farmers' awareness about inter-state bidding process at e-NAM	48.00
7	Farmers' awareness about online transfer of money into their bank account in e-NAM	08.00

Regarding the trading processes facilitated by e-NAM, farmers' awareness about the assaying process at e-NAM was noted by 50.00 percent of farmers, signifying a moderate level of awareness about the quality assessment procedure conducted within the platform. Additionally, farmers' awareness about the online bidding process received acknowledgement from 52.00% of farmers, indicating a relatively higher level

of understanding regarding the online bidding mechanism employed in e-NAM. Furthermore, farmers' awareness about the inter-state bidding process at e-NAM was recognized by 48.00 percent of farmers, implying a reasonable level of knowledge regarding the potential to engage in inter-state trading activities through e-NAM. This finding suggests that a substantial portion of farmers are aware of the cross-border trading opportunities available via the platform. The results indicate varying levels of awareness among farmers regarding different aspects of e-NAM. While awareness about the overall existence of e-NAM is relatively high, there is a need to improve understanding and knowledge regarding specific features such as registration, lot identification, assaying process, online bidding, inter-state bidding, and online money transfers. Strengthening awareness and providing comprehensive information on these aspects will contribute to the effective utilization and participation of farmers in e-NAM, facilitating a more inclusive and efficient agricultural market ecosystem. According to Kalamkar et al. (2019), the majority of farmers in Gujarat lacked sufficient knowledge about the e-NAM system. As a result, they were hesitant to provide their bank details and Aadhaar card numbers, which are necessary for registration. This hesitation stemmed from concerns about the e-NAM system and potential misuse of their income information for income tax purposes. The researchers also discovered that no government initiatives were undertaken to educate farmers about e-NAM. In light of these findings, the study recommended the importance of establishing trust between farmers and traders regarding the new technology-based system, and emphasized the need for government-led awareness programs to inform farmers about e-NAM.

Table 3: Motivational factors for farmers to participate in e-NAM

S. No.	Motivational factors to participate in e-NAM	Percentage of Respondents
1	Remunerative price	22.00
2	No middle man	14.00
3	Immediate cash after sale	32.00
4	Better infrastructure	32.00

Table 3 presents the percentage distribution of farmers based on their perception of motivational factors for participating in the electronic National Agriculture Market (e-NAM) Agricultural Produce Market Committee (APMC). Among the surveyed farmers, the most prominent motivational factor was "Immediate cash after sale," with 32.00 percent of respondents expressing this as a driving force for their participation in e-NAM APMC. This result indicates that farmers highly value the ability to receive cash immediately after selling their agricultural produce through the e-NAM platform. The availability of immediate cash can be crucial for farmers who rely on the

income generated from their produce to sustain their livelihoods and cover their expenses. The next significant motivational factor identified by 32.00 percent of respondents was "Better infrastructure." This finding suggests that farmers perceive improved infrastructure as an important factor that influences their decision to participate in e-NAM APMC. Enhanced infrastructure can encompass various aspects, such as efficient transport facilities, proper storage and warehousing facilities, and advanced market information systems. These factors contribute to a smoother and more streamlined trading process, ensuring that farmers have access to better market opportunities.

Another notable factor indicated by 22.00 percent of respondents was "Remunerative price." This result implies that farmers are driven by the prospect of receiving fair and profitable prices for their agricultural produce through the e-NAM APMC. Access to a wider market through the e-NAM platform might provide farmers with the opportunity to obtain competitive prices for their products, thereby improving their income and financial well-being. The least influential factor, as reported by 14.00 percent of respondents, was "No middleman." Although this factor was deemed less significant overall, it still holds importance for a certain percentage of farmers. The elimination of intermediaries in the agricultural supply chain can result in higher returns for farmers by reducing the commissions and fees charged by middlemen. Additionally, direct access to buyers can lead to better negotiation power for farmers, enabling them to secure better prices for their produce. Although the elimination of middlemen ranked lower, it remains a contributing factor for a subset of farmers. These findings emphasize the significance of addressing these motivational factors to encourage wider participation and uptake of the e-NAM APMC platform, ultimately benefiting farmers by enhancing their market access and financial outcomes.

4 CONCLUSION

In conclusion, the findings from the study provide insights into the socio-economic characteristics of the farmers and their awareness levels and perception of motivational factors regarding the electronic National Agriculture Market (e-NAM) and Agricultural Produce Market Committee (APMC). The majority of the surveyed farmers were illiterate, highlighting the importance of user-friendly digital platforms like e-NAM for farmers with limited education levels. The high level of awareness about the overall existence of e-NAM indicates the potential for widespread adoption and utilization of the platform. However, there is a need to improve understanding and knowledge regarding specific features such as registration, lot identification, assaying process, online bidding, inter-state bidding, and online money transfers. Enhancing

awareness in these areas will facilitate effective utilization and participation of farmers in e-NAM, leading to a more inclusive and efficient agricultural market ecosystem.

Regarding the motivational factors for participating in e-NAM APMC, the most prominent factor identified was "Immediate cash after sale." This highlights the importance of timely payments for farmers, who rely on the income generated from their produce. "Better infrastructure" was also perceived as an influential factor, emphasizing the role of improved facilities in enhancing market opportunities for farmers. The prospect of receiving "Remunerative price" for their agricultural produce was another significant motivational factor. Although the elimination of middlemen ranked lower, it still held importance for a subset of farmers, emphasizing the need to address this factor to enhance farmers' market access and financial outcomes.

To promote wider participation and uptake of e-NAM APMC, it is crucial to address farmers' awareness gaps and improve their understanding of specific features. Additionally, efforts should be made to ensure timely payments, enhance infrastructure, and provide opportunities for farmers to obtain competitive prices. By addressing these factors, e-NAM APMC can effectively support farmers in maximizing their economic well-being and contribute to the overall development of the agricultural sector.

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