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CONSTRAINTS IN ADOPTION AND UTILISATION OF ELECTRONIC NATIONAL AGRICULTURE MARKET BY FARMERS

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ABSTRACT

The present study was conducted in Meerut district of Western Uttar Pradesh to examine the constraints faced by farmers in the adoption and utilisation of the Electronic National Agriculture Market (e-NAM). A total of 80 farmers were selected through random sampling and data were collected using a structured interview schedule. Results revealed that farmers encounter several operational and infrastructural barriers while participating e-NAM. The major constraints reported were difficulty in registration (61.25%), inadequate storage facilities (60.00%), lengthy procedures (56.25%) and lack of proper grading and assaying facilities (55.00%). Some important issues such as limited awareness, poor digital literacy and irregularity in payment were also noted. These findings suggest that though e-NAM has the potential to improve transparency in agricultural marketing and enhance farmers' income and its field-level functioning remains restricted due to ground-level challenges. The study highlights the need for strengthening ICT support, simplifying registration procedures, improving infrastructure in mandis and enhancing awareness among farmers through training and extension services. Addressing these concerns will make e-NAM more inclusive, farmer-friendly and effective in achieving its intended objectives of unifying agricultural markets in India.

Keywords: *electronic national agriculture market (e-nam), constraints, farmers, agricultural marketing, digital adoption*

INTRODUCTION

Agricultural marketing is vital aspect of the Indian economy as it ensures remunerative prices to farmers and strengthens the rural economy. However, the traditional marketing system in the country has often been criticized for inefficiencies such as dominance of intermediaries, inadequate transparency in price discovery and restricted access to wider markets by Acharya and Agarwal (2011). These limitations frequently reduce farmers' share in the consumer rupee and make them vulnerable to price fluctuations by Chand (2016). Similar market inefficiencies were reported in earlier studies across India by Bisen and Kumar (2018).

To overcome such challenges, the Government of India introduced the Electronic National Agriculture Market (e-NAM) in 2016 as a pan-India electronic trading portal. The platform was designed to integrate Agricultural Produce Market Committees (APMCs), improve transparency in transactions and provide farmers with better opportunities for marketing their produce (DAC and FW, 2017). Theoretically, e-NAM should increase competition, lessen the need for middlemen, guarantee prompt and equitable payments and improve market accessibility by Thakur, et al (2019). Similar observations were reported by Praneeth, et al (2024), who found that farmers' perception and awareness significantly influence their participation in digital marketing platforms such as e-NAM.

Despite these potential benefits, adoption and effective utilization of e-NAM by farmers remain limited. Several studies have highlighted constraints such as low awareness, digital illiteracy, poor internet connectivity, lack of assaying and grading facilities, difficulties in registration and inadequate storage and transportation support (Meena, et al. 2020; Vinaya et al., 2018; Singh et al., 2021). Similar digital-access gaps were observed in Rajasthan and Andhra Pradesh according to Roshini, et al (2018). These challenges indicate that the benefits of the platform cannot be fully realized unless the operational and infrastructural barriers are addressed. Variations in e-NAM performance across different states and markets have also been highlighted in recent assessments by Bandhavya, et al (2024). Similar regional disparities were also highlighted in Odisha and Andhra

Pradesh, where farmers reported inconsistent implementation and support services (Majhi, 2018; Chandana, 2018) Studies conducted in different regions have also shown that farmers' participation in e-NAM increases when institutional support and market infrastructure are adequately developed by Kalamkar (2017).

In Uttar Pradesh, agriculture continues to be the primary livelihood source for the majority of the rural population. The state has been among the early adopters of e-NAM, with several mandis linked to the national platform. Yet, farmers continue to face difficulties in using the system effectively due to socio-economic and institutional factors Kumar and Yadav, (2022). Similar patterns of constraints among e-NAM users were also reported in eastern Uttar Pradesh Srivastava and Bohra, (2022). Hence, there is a pressing need to assess the constraints that hinder smooth adoption of e-NAM at the grassroots level.

Against this backdrop, the present study was conducted with the objective of identifying and analysing the constraints faced by farmers in the adoption and use of e-NAM. The results are expected to provide valuable insights for policymakers, extension agencies and market regulators to strengthen digital marketing reforms and make e-NAM more farmer-friendly.

OBJECTIVE

To identify the constraints faced by farmers in utilisation of Electronic National Agriculture Market (e-NAM) and assess how these relate to selected socio-economic characteristics to suggest measures for better utilisation.

METHODOLOGY

The present investigation was carried out in Meerut district of Western Uttar Pradesh during 2021-22. The district was purposively selected as it has an active e-NAM mandi and a considerable number of farmers registered with the platform. A list of registered farmers was obtained from the mandi records and 80 respondents were selected randomly to serve as the sample for the study. According to Nitesh, (2018) A comparable sampling approach was used in earlier e-NAM studies.

Prior to data collection, a pilot study was undertaken to gain familiarity with the respondents and to test the feasibility of the research instruments. A structured interview schedule was prepared on the basis of the pilot study, relevant literature and expert suggestions. The schedule was pre-tested with a small number of farmers and suitably modified. Final data collection was done through personal interviews after establishing good rapport with the respondents.

Constraints were operationally defined as the difficulties encountered by farmers in the adoption and use of e-NAM. A list of possible constraints was developed from the pilot study and literature review. Respondents were asked to indicate whether they faced each constraint and to rank them according to their severity. Similar listing of constraints was followed by Deshmukh et al. (2018).

Statistical tools used

The collected data were coded, tabulated and analysed with the help of the following statistical tools:

1 **Frequency and Percentage** – to assess the proportion of respondents reporting each constraint.

2 **Mean and Standard Deviation** – to describe the central tendency and variability in responses.

3 **Ranking Order** – to prioritize the reported constraints based on percentage values.

4 **Coefficient of Correlation** – to examine the relationship between selected socio-economic variables (education level, landholding size) and major constraints.

5 **Binary Logistic Regression** – applied to the two most critical constraints, namely *difficulty in registration* and *inadequate storage facilities*, which were coded as dichotomous variables. This helped in identifying the socio-economic predictors influencing the likelihood of facing these problems.

The use of descriptive as well as inferential statistics provided not only the ranking of constraints but also deeper insights into the socio-economic factors associated with the adoption of e-NAM.

RESULTS AND DISCUSSION

Constraints in e-NAM

The constraints faced by farmers in participating and utilising e-NAM were identified and prioritized based on the percentage of respondents reporting them. The results are presented in Table 01.

Table 1 : Distribution of respondents according to constraints in e-NAM (n = 80)

Sr. No.	Perceived constraints	Frequency	Percent	Rank
1	**Problem faced during registration**	49	61.25	I
2	**Problem in storage facility**	48	60.00	II
3	**Lengthy and time-consuming process**	45	56.25	III
4	**Payment delay on same day of transaction**	39	48.75	IV
5	**Weighment only after declaring winner**	32	40.00	V
6	**Difficulty in maintaining accounts off-season**	30	37.50	VI

It is clear from the table that the most serious problem was faced during registration (61.25%), followed by lack of storage facilities (60.00%). Earlier studies also observed that farmers benefit more from e-NAM when adequate storage and market support systems are available (Singh and Pant, 2020; Machapathri et al., 2024). Lengthy processes (56.25%) and delay in payments (48.75%) also emerged as major issues. These findings are aligned with earlier studies (Meena et al., 2020; Singh et al., 2021), which reported that infrastructural and procedural challenges limit the effectiveness of e-NAM.

Association of constraints with socio-economic variables

Table 2 : Correlation between socio-economic variables and key constraints (n = 80)

Socio-economic variable	Correlation coefficient (r)	p-value	Result
Education level	–0.32	0.021*	Significant (Negative)
Landholding size	0.41	0.009	Significant (Positive)

(*Significant at 5% level)

The correlation analysis revealed that education level had a significant negative association with registration problems, indicating that better educated farmers faced fewer difficulties during registration. Comparable findings were noted by Chaudhari et al. (2024), who also reported significant influence of socio-economic characteristics on farmers' marketing behaviour. Landholding size showed a significant positive correlation with storage facility problems, suggesting that farmers with larger holdings experienced greater storage-related issues. Patil and Chengappa (2022) similarly observed that farmers' structural attributes strongly shape their participation and efficiency in marketing systems.

Predictors of Major Constraints

Binary logistic regression was employed for the two most critical constraints (Table 03).

Table 3 : Logistic regression analysis for predictors of major constraints

(n=80)

Constraint	Predictor	Odds Ratio	95% CI	p-value
Registration problem	Education level	0.62	0.41–0.93	0.021*
Storage facility problem	Landholding size	1.78	1.12–2.84	0.015*

(*Significant at 5% level)

The results revealed that farmers with higher education were less likely to face registration issues (OR = 0.62), whereas those with larger landholdings were more likely to report storage-related problems (OR = 1.78). These findings emphasize the importance of educational interventions and infrastructural improvements for enhancing the effectiveness of e-NAM.

Suggestions for improvement

Based on the constraints identified, the following suggestions were made to improve the functioning of e-NAM:

- Simplify registration procedures and provide clear instructions with document checklists.
- Strengthen storage facilities within mandis for farmers unable to sell on the same day.
- Increase bidding counters and computers to reduce delays during auction.
- Ensure prompt payment by allowing part cash payment

through APMCs, supplemented with digital transfers.

- Establish bank branches within mandi premises to facilitate instant payments.
- Develop a feedback mechanism to continuously monitor farmers' problems.
- Provide training and awareness programmes to improve farmers' knowledge and digital literacy.
- Ensure stable internet connectivity for smooth functioning of online transactions.

These findings and suggestions align with the recommendations of Thakur et al. (2019) and Kumar and Yadav (2022), who highlighted the need for infrastructural and institutional support to strengthen digital agricultural markets.

CONCLUSION

The study revealed that despite the potential of e-NAM to improve transparency and market access, farmers continue to face several operational and infrastructural constraints in its use. The most critical challenges identified were difficulties in registration, inadequate storage facilities, lengthy procedures and delays in payment. Correlation and logistic regression analysis further indicated that education level had a significant influence on registration-related difficulties, while landholding size was closely associated with storage constraints faced by farmers using e-NAM. Similar recommendations were made in national reviews on agricultural market reforms by Shalendra and Jairath, (2016).

These findings highlight that improving digital literacy, simplifying registration procedures and strengthening storage and payment infrastructure are essential to enhance the effectiveness of e-NAM. Focused training, better ICT support and institutional reforms can help farmers fully realise the benefits of this platform. Addressing these barriers will not only increase participation but also make e-NAM a more inclusive and farmer-friendly initiative, thereby contributing to the goal of creating a unified national agricultural market.

RECOMMENDATIONS

Farmers face practical challenges in using e-NAM due to limited digital skills and weak infrastructure. Regular training, improved storage and payment facilities and reliable internet connectivity are needed to enhance its use. Simplifying procedures and strengthening digital support can further encourage participation and make e-NAM more accessible and effective for farmers.

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CONFLICT OF INTEREST

Authors declare that there is no conflict of interest associated with this research work.

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