RESEARCH ARTICLE Agricultural Reviews, Volume 46 Issue 2: 330-335 (April 2025)

Assessment of Awareness Level of e-NAM among the Jute Farmers of Cooch Behar District in West Bengal

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10.18805/ag.R-2592

ABSTRACT

Background: The government of India launched e-NAM in 2016 with the concept to unify nationwide agricultural markets by creating a central online platform. More than six years have passed since the inception of the scheme, yet the studies claim the unawareness among stakeholders regarding e-NAM. Thus, the present study is an attempt to assess the level of awareness about e-NAM in the Cooch Behar district of West Bengal among Jute farmers.

Methods: The study was conducted with the help of primary data collected from 80 farmers of Cooch Behar district, selected through a multistage sampling technique. Awareness level is operationalised on a percentage basis and logistic regression is used to examine the factors affecting awareness about e-NAM.

Result: The findings revealed that 56.25 per cent of sample farmers were found unaware, 23.75 per cent were moderately aware and 20 per cent were aware of the e-NAM. The farmers were unaware of the basic facilities and technologies available under e-NAM. The significant factors affecting awareness are access to market information, education level, distance to the nearest mandi and participation at training/awareness camps. The concerned APMCs should put extra effort into raising awareness of e-marketing.

Key words: Awareness level, e-NAM, Logistic regression, Multi-stage sampling.

INTRODUCTION

In India, agriculture has remained the major source of livelihood for ages. The sector shares 18.8 percent of GVA of the total economy (Economic Survey, 2021-22) and has witnessed buoyant growth in production and productivity, albeit farmers still resort to distress sale due to poor marketing facilities. Agriculture markets in India have been subjected to various reforms and it is requisite to provide the farming community with market accessibility, transparency and provision of remunerative prices (Manjula, 2021). Before independence, the major concern of the government policies was to check the prices of food for the consumers and agro-raw materials for the industries. However, soon after independence, state governments started enacting Agricultural Produce Marketing Committee (APMC) to protect illiterate farmers from exploitation by traders and commission agents. Although the APMCs has cleansed several malpractices and imperfections in agricultural markets, it has checked the development of a competitive marketing system and provided no help to farmers in direct marketing, retailing, supply and adoption of innovative marketing system. Apart from APMC, the Essential Commodities Act, 1955 and the profusion of Control Orders publicized under this act by the center and states prevented the development of a free and competitive marketing system in the country. As a result, the pace of reforms continued to be slow and vacillating and the share of agriculture in the national GDP dwindled over time (Ministry of Agriculture and Framer's Welfare, 2017).

Then in the 1990s, agriculture reforms witnessed a divergent paths, but more focused consideration was visible only in the first decade of the century. Observing the inefficiency caused by licensing/registration, market controls and other interference introduced by APMC Act, it was strongly felt that an alternative marketing system needs to be introduced. Further, greater participation of the private sector should be encouraged to make investments required for the development of marketing infrastructure and other supporting services (Baskar and Shalendra, 2022). Accordingly, the then Department of Agriculture and Cooperation, Government of India, formulated a model law on agricultural marketing in consultation with the states and came up with the draft model legislation titled the State Agricultural Produce Marketing (Development and Regulation) Act, 2003. However, implementation of the model APMC Act was either patchy or uneven across the states (Reddy, 2018). Originally, the APMC act was intended to protect farmer's interests but over the years, the act turned

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How to cite this article: Barman, D., Katoch, S. and Anoop, M. (2025). Assessment of Awareness Level of e-NAM among the Jute Farmers of Cooch Behar District in West Bengal. Agricultural Reviews. 46(2): 330-335. doi: 10.18805/ag.R-2592.

Submitted: 16-09-2022 **Accepted:** 27-01-2023 **Online:** 13-03-2023

out to be inoperative as the lack of supportive institutional mechanisms and infrastructural facilities left farmers dependent on middlemen which sometimes turned exploitative (Aggarwal *et al*., 2016).

Under APMC, the surplus from an area was moving through a network of intermediaries, multiple market areas and institutional agencies. There was no national-level regulation and the existing regulations were not providing a barrier-free markets in the country (NABARD, 2018). Therefore, there was a need to develop a national-level single market for agricultural commodities by removing all the existing barriers to licensing, movement and storage. Subsequently, the integration of agriculture markets across the country through e-platform was seen as an important measure to overcome the challenges created by the present marketing system and it became the need of the hour to unify markets both at the state and national levels to provide better price to farmers, improve supply chain, reduce wastages and create a unified national market (Yadav and Sharma, 2017). Therefore, with a concept to unify all nationwide agricultural markets and endeavors of integration of Agricultural Produce Marketing Committees by creating a central online platform for agricultural commodities, the government of India, approved a central sector scheme National Agriculture Market (NAM) in 2016. The e-NAM envisaged as a pan-India electronic trading platform providing a single window service for all APMC related information and services. While material flow *i.e.* agriculture produces continues to happen through mandis, an online market reduces transaction costs and information asymmetry (Kumar *et al*., 2016).

The e-NAM was intended to be a market-based mechanism for efficient price discovery by the farmers, but it turned out to be less effective than desired (Ghosh, 2021). Further, there is a requirement for a wide correlation between producer, market channels, retailer and consumer. As a result, the government attempted some reforms by persuading states to undertake interventions such as e-trading through the adoption of the model Agricultural Produce and Livestock Marketing (APLM) Act, 2017 advocated electronic markets (e-markets) through the abolition of the concept of notified area, so that anyone from anywhere can trade in a local market through participation in electronic auction platforms (Kumar and Pant, 2020). Also, the number of markets for e-NAM was scaled up to cover more markets and farmers, which were allowed to sell and transport directly from registered warehouses and Farmer Produce Organisations. With all these efforts, the government is earnestly pursuing with states to amend their marketing laws to engender a suitable legal framework and policy atmosphere to usher in marketing efficiency. The number of APMC mandis recorded under e-NAM as on 30th Sep 2022 are 1260 from 22 states and 3 UTs (Fig 1).

Jute in West Bengal

West Bengal is the undisputed king of jute in India with a share of nearly 80 per cent in the area and 83 per cent in production followed by Assam and Bihar. Traditionally jute was used to make hessian cloths and sacks, but now jute has been diversified to make various products like all kinds of bags from necessary to luxury, sacks, carry bags, door-mats, carpets, file- covers, sofa backs and covers, decorates, shoes and sandals, curtails, *etc*. (Das and Chanu, 2016).

At the farmers' level, jute marketing is concerned with the domestic market. Basically, jute marketing is done as raw jute marketing at the farmers' level. It is raw in the sense that farmers sell jute fiber as a raw material without making any change in its physical appearance and grading. As an agricultural product jute is not perishable, it can be stored for a long time. But since farmers need money, jute is disposed of immediately after the fiber is ready to sell at the farmers' level. The final consumers of jute are jute mills**.** Keeping in mind the versatile character and importance of jute, the present study is an attempt to analyse the level of awareness among jute growers about e-marketing.

Materials and Methods

Multi-stage sampling technique has been used to draw the sample in the present study. West Bengal was selected purposely because the state is the largest producer of Jute in India. West Bengal consists of 23 districts, out of which Cooch Behar was selected randomly in the sampling's first stage. Cooch Behar district has 12 blocks, out of which 2 blocks *viz*. Dinhata-I and Dinhata-II were selected in the second stage. In the third stage, two villages from each block *i.e.* Gitaldaha-I and Okrabari from Dinhata-I and Bara Sakdal and Burirhat-I from Dinhata-II were selected. Further, from each village 20 jute farmers were selected, making a total sample size of 80 respondents.

The respondent's awareness level was checked using 10 questions interviewed during the survey. Based on the total score and standard deviation, the respondents are divided into three awareness categories (Table 1) that are significantly aware, moderately aware and unaware (Katoch, 2021).

The Binomial Logistic model/Logit model is used to evaluate the factors responsible for e-NAM awareness among the sample farmers. The value of the dependent variable in the model was taken as 1 if the respondent is aware of e-NAM and 0, if not. The logistic regression constrains the value of probability between 0 and 1 (Peng, Lee and Ingersoll, 2002). The expression of the model is;

$$\text{Logit}\,(P_i) = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_o + \sum \beta_i X_{ij}$$

In Logit Distribution Function,

$$P_i = \frac{1}{1 + e^{-(\beta o + \Sigma piXi)}}$$

$$P_i - \frac{1}{1 + e^{-zi}} - \frac{e^{-zi}}{1 + e^{-zi}}$$

$$\text{If, } Z_i + \beta_0 + \sum \beta_i X_i$$

And

$$(1 - p_i) = 1 - \frac{e^{-zi}}{1 + e^{-zi}} = \frac{1}{1 - e^{-zi}}$$

Where,

P_i = Probability of the i^{th} respondents awareness of e-NAM.

1 = log-odds ratio in favour to yes about e-NAM.

$1 - P_i$ = Probability of the i^{th} farmer having no awareness about e-NAM.

$$Ln = \frac{P_i}{1 - P_i} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7$$

Where,

Y = Awareness about e-NAM.

X_1 = Education.

X_2 = Age.

X_3 = Landholding.

X_4 = Training.

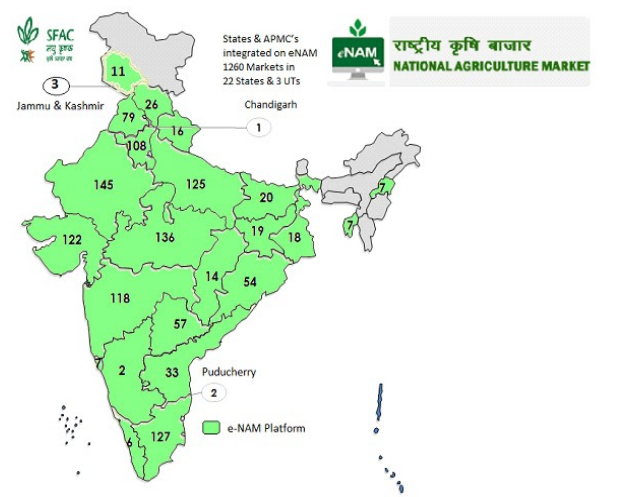
X_5 = Occupation.

X_6 = Distance to the nearest mandi.

X_7 = Access to Market Information.

The variables and their possible signs are summarized in Table 2 (Chauke *et al.,* 2015).

Education was expected to have a positive sign because if the education level increases the awareness tends to increase and vice-versa. The relation with age was expected to be either positive or negative because age may or may not define awareness level. The land holding sign was expected to be positive, as the farmers with larger holdings were opting for online trading rather than relying on intermediaries. If a farmer had attended a training program of e-NAM, s/he is expected to be aware of e-NAM, thus the sign assigned was positive. Expected signs with an occupation were both positive and negative. In the case of distance to the nearest mandi, the expected sign was negative because if a farmer is residing far from the mandi, then s/he is expected to be less aware of the campaigns and exhibitions related to e-NAM. The expected sign for access to market information was also positive as access to information engenders the awareness level.



Source: (https://enam.gov.in/web/).

Fig 1: Number of e-NAM mandis in the country.

Table 1: Classification of respondents according to awareness level about e-NAM.

Particulars	Awareness level
Significantly aware	>Mean+SD
Moderately aware	Mean±SD
Unaware	<Mean-SD

RESULTS AND DISCUSSION

Level of awareness about e-NAM among jute farmers

The e-NAM is functioning since 2016 but still many farmers in the study area turned out to be not aware of e-NAM and its provisions and they prefer traditional marketing over online trading. To check the level of awareness about e-NAM, ten questions have been asked from the selected respondents. The perusal of Table 3 represents the frequency distribution of the level of awareness about e-NAM among the farmers. About 43.75 per cent of the farmers revealed that they have heard about the e-NAM while 56.25 percent of the farmers didn't even hear about it. When asked about the provisions of e-NAM, 20 per cent of the farmers were found aware. Only 5 per cent of farmers in the study area were aware of the e-NAM mobile app. While answering the question about registration in mandi for e-NAM, only 5 percent of the farmers were found aware of it. Similarly, when asked about the highest bidder paying the amount *via* NEFT which is transferred to the recipient bank account, only 2.5 per cent of farmers were aware. None of the farmers knew about the lot ID generated about the product, SMS alert provided after the transaction, information about the lot which is broadcasted online for bidding, delay in online payment in e-NAM and guidance or help desk availability, *etc*. This show that, only a few farmers are aware of e-NAM despite claimed rigorous training and awareness camps.

Awareness of respondents about e-NAM

After calculating the level of awareness, the respondents were grouped into three categories that are significantly aware, moderately aware and unaware. Perusals of Table 4 revealed that overall, 23.75 per cent of respondents were found significantly aware, 20 percent were found moderately aware and 56.25 per cent were unaware. This suggests that the majority of respondents were unaware of e-NAM.

Kumar *et al*. (2017) performed a similar study about awareness of e-NAM in Telangana and Madhya Pradesh markets. According to them, less than 50 per cent of farmers in Telangana were aware of e-NAM in all of the selected markets, while none of the respondent farmers in Madhya Pradesh markets were aware of e-NAM. Sonawane *et al*. (2021) also reported low level of awareness about e-NAM

Table 2: Variable description and expected sign in logit regression model.

Particulars	Description	Expected sign
Dependent variable		
Awareness about e-NAM	(Aware =1 ; Unware =0)	
Independent variables		
Education	0 = Illiterate	
	1 = Primary	
	2 = Middle	
	3 = Matric	
	4 = Senior secondary	
	5 = Graduate and above	+
Age	Number	+/-
Size of land holding	Marginal (<1 ha), small (1-2 ha) and semi-medium (2-4 ha), medium (4-10 ha), large (>10 ha)	+
Training	1 = Trainings attended	
	0 = Not attended	+
Occupation	1 = Agriculture	
	2 = Farm labour	
	3 = Business	
	4 = Service	
	5 = Non-farm labour	+/-
Distance to the nearest mandi	In kilometers	-
Access to market information	1 = access to some information	+
	0 = No access to any information	

Table 3: Statement-wise awareness level of respondents about e-NAM. (Per cent)

Questions	Yes	No
Have you heard about e-NAM?	43.75	56.25
Do you know about provisions of e-NAM?	20.00	80.00
Have you used e-NAM mobile app?	5.00	95.00
Do you know that you have to register before taking your produce to mandi for e-NAM?	5.00	95.00
Do you know that a lot ID is generated for your product?	0.00	100.00
Do you know the SMS alert provided after the transaction?	0.00	100.00
Do you know that information about your lot is being broadcasted online for bidding?	0.00	100.00
Did you know that the highest bidder pays amount via NEFT which is transferred to your Bank Account?	2.50	97.50
Do you know about the delay in online payment of e-NAM?	0.00	100.00
Do you know of guidance or help desk availability?	0.00	100.00

Table 4: Overall awareness of respondents about e-NAM.

Particulars	Percentage
Significantly aware	23.75
Moderately aware	20.00
Unaware	56.25

among farmers in Maharashtra. Singh and Alagawadi (2021) showed similar results in Andhra Pradesh.

Factors affecting awareness about e-NAM by the jute growing farmers

The assessment of the awareness level of e-NAM among farmers revealed the harsh fact of unawareness in the sample size. Thus, an attempt was made to determine the factors responsible for awareness status, for which the logistic regression model was used. The regression analysis in the LOGIT model was done with binary variables and the results has been presented in Table 5. For aware, the binary variable assigned was 1 and for non-aware 0. The pseudo R^2 value was recorded as 0.52 which indicates that 52 percent of the variations in the probabilities of awareness have been explained by the covariates in the LOGIT model. Factors such as access to market information were found significant at a 1 per cent level. Education and distance to nearest mandi were significant at a 5 per cent level, while training was significant at a 10 per cent level.

The sign of the variables determines the effect on awareness. The positive sign of the education variable implies that with an increase in education level, the chances of awareness increased significantly. Singh and

Table 5: Factors affecting the awareness about e-NAM by the jute growing farmers.

Parameter	Estimate	Standard error	Z	p-value	Odds-ratio	Marginal effect
Constant	-9.489	3.08	-3.07	0.002	-	-
Education	0.214**	0.09	2.28	0.023	1.23	0.051
Age	0.040	0.04	0.96	0.337	1.04	0.009
Landholding	0.074	0.08	0.89	0.373	1.07	0.017
Training	2.424***	1.36	1.78	0.076	11.30	0.416
Occupation	-0.010	0.25	-0.04	0.968	0.98	-0.002
Distance to the nearest mandi	-0.346**	0.16	2.10	0.036	0.41	-0.083
Access to market information	4.241*	0.92	4.59	0.000	69.49	0.785
Pseudo R^2			0.52			

*, **, *** represents significance at 1%, 5% and 10% levels respectively.

Alagawadi (2021) also reported significant influence of level of education on awareness about e-NAM among farmers. The sign of the training and access to market information were found positive. The sign of distance to the nearest mandi is negative. This shows more training/awareness camps should be provided to the farmers to generate the awareness level. The relationship between the nearest mandi distance and e-NAM awareness showed opposite relationship; if the distance to the nearest mandi increases, the probability of e-NAM awareness decreases and vice versa. The positive sign of access to market information means that if farmers have access to the current happenings they are aware of e-NAM. Factors such as age, landholding and occupation were found not to have any significant influence on the awareness of e-NAM.

The value of the odds ratios of independent variables shows the change in odds ratio per unit change in independent variables, *i.e.* chance of awareness as compared to the chance of unawareness of the e-NAM. The value of an odds ratio greater than one indicates a positive influence on awareness while less than one indicates a negative influence. The odds ratios of education, training, distance to the nearest mandi and access to market information infer that with one unit change in these variables, the odds in favour of awareness of e-NAM increase respectively.

The marginal effect shows the change in probability when the independent variable changes by one unit. For continuous variables, this represents the instantaneous change given that the unit may be very small. Keeping all other values constant, the chances of awareness of e-NAM increase by 0.051 with increased education level, 0.416 with increased training, 0.083 with a decrease in distance to the nearest mandi and 0.785 with access to market information.

Conclusion

Agricultural marketing is witnessing major changes the world over, owing to the liberalization of trade in agricultural commodities. To benefit the farming community for the new global market access opportunities, the internal agricultural marketing system in the country should be integrated and strengthened. The government of India launched e-NAM half a decade ago, yet the farmers are unaware of the provisions of e-NAM, in fact, some claims that they don't even know such a scheme exists. Thus to check the level of awareness among the respondents of the sample area, a perception technique was operationalised based on the total score and standard deviation from the questions asked during the survey. 56.25 per cent of the farmers turned out to be unaware of the e-NAM while 23.75 per cent were moderately aware. Only 20 per cent were aware of the e-NAM among selected jute growers. The farmers had no idea about the lot ID generated about the product, SMS alert provided after the transaction, information about the lot which is broadcasted online for bidding, delay in online payment of e-NAM and guidance or help desk availability *etc*. To examine the factors affecting awareness level, logistic regression was run. Among the opted factors, access to market information, education, distance to the nearest mandi and participation at training/awareness camps were found significant. e-NAM was expected to help farmers and traders by giving access to multiple markets easily. It is sad that a large proportion of farmers are not aware of this facility and hence not able to make use of this. The concerned APMCs should put extra effort in raising the awareness of e-marketing and the benefits of opting for e-NAM for transactions as compared to the traditional and orthodox ways of marketing.

Conflict of interest

All authors declare that they have no conflict of interest.

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