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# Awareness and Determinants of Farmers Participation in e-Marketing of Agricultural Commodities in India

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**ABSTRACT**

Integration of APMCs across the country through e-NAM was to augment price discovery and dissemination. The process of electronic marketing being new to the stakeholders, the awareness and constraints entailed herein are addressed. This study evaluates the extent of awareness among farmers about different processes of e-marketing, along with the determinants of their participation. A total of 240 farm households were selected randomly through multistage sampling for the primary survey. The result of the study infers that distance to the market and farm size of the farmers was the most important factors that determine farmers' participation in e-marketing. Awareness about different e-marketing processes among farmers is relatively lower in Andhra Pradesh compared to Karnataka. The promotion of more participation to create an efficient marketing system there is a need for elaborated awareness about e-marketing among farmers and also increases the capacity building programmes to enhance knowledge about several process of trading.

## INTRODUCTION

Over the years the dissonance between the increases in food production of the country has significantly increase in income of the farmers has been descend explicitly. This might be due to poor marketing infrastructure, prevalence of inefficiency, fragmented marketing channels, and policy distortions (Chand, 2012). Agricultural marketing's post-harvest supply chain architecture, which directly affects revenue realization, has not received much attention (Reddy, 2018). Existing system proves poor price discovery process against the background of subpar marketing and related infrastructure (Nuthalapati et al., 2020). Moreover, the conceptually farmers friendly APMC (Control) Act has turned to an apathetic and acquired anti-competitive behaviour. To overcome this prevailing environment, the major reform in agricultural marketing was in the year 2003 by implementing Model Agricultural Produce Market Committee (Development and Regulation) Act, 2003. However, APMC aimed at removing several hurdles viz restricting private players in creation of infrastructure, development of alternative marketing channels for farmers and creating a competitive market for the agriculture development. Similarly, to overcome limitations in present marketing system and improve overall efficiency in the system. Government of India came up with new marketing reform by amending model act into Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act, 2017. This act facilitates freedom to the farmers to sell their produce across time and space. It allows for integration of the APMCs creating common platform for trade across states. In essence, it is a common market not a single market because taxes and charges still applicable (Roy et al., 2017).

The essence of a common market was to make the free flow of agricultural commodities in market without any institutional

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barriers, so that producers or traders can sell them with the same freedom across the borders (Roy et al., 2017). Despite the adoption of improved information communication technologies to provide transparency in agri-business and appropriate decisions making in marketing of agricultural produce with the objectives of real-time price dissemination and spot price discovery has not been achieved (Dey, 2016). An attempt was made in this direction by Government of Karnataka by implementing reforms in market structure and devising innovative practices to improve agriculture market and competitiveness (Chand, 2016).

To achieve transparency and price determination with technology enabled environment Government of India, implemented e-National Agricultural market (e-NAM) in 2016 which is in line with famous Karnataka model of e-trading i.e. Rashtriya e-Market Service (ReMS). In Karnataka ReMS has implemented e-tendering in all 165 markets covering about 60 commodities, whereas e-NAM covers 203 commodities (www.enam.gov.in). As a result, a farmer would now be able sell to a distant buyer without having to choose or travel to a different market, by market integration at state level eventually nationwide and streamline uniform market procedures (Bisen & Kumar, 2018). The implementation of these reform needs to ensure that farmers have better understanding and awareness about different processes. In this backdrop, it becomes imperative to evaluate the extent of awareness of different processes of e-marketing and factors motivating farmers to participate in e-market.

## METHODOLOGY

The secondary data related to farmers' participation was collected from e-NAM database. The detailed primary survey was undertaken during the 2019-20 with the pre-tested questionnaire. Each district from Karnataka and Andhra Pradesh were chosen randomly to understand learning under awareness and perceptions of the both the e-NAM and ReMS model. Data comprising of 240 farmers were randomly selected with 120 farmers each in Chitradurga and Kurnool districts with 60 participants and 60 non participants of e-marketing in each district. The awareness of farmers pertaining to different process of e-marketing like, computerised gate entry, bidding process, sale of produce, mode of payment received by farmers were collected. The perception related information was also analysed using parameters like, training facilities, extent of implementation, infrastructure created and quality assaying and grading.

The logit model analyses determinants of the participation of the farmers in e-marketing considering the household characteristics, resources endowment, asset class etc. Such a model is appropriate if participation fits into a dichotomous choice, essentially taking on values of zero and 1. The behaviour of the household towards participation of farmer in electronic market is defined as:

$$Z_i = \beta_0 + \sum_{i=1}^{n} \beta_i X_{ki}$$

Where, $\beta_0$ represents the intercept term and $\beta_i$s are the coefficients associated with the explanatory variables $X_{ki}$. These factors explain the participation behaviour and the probability that $i^{th}$ household decides to adopt a certain practice. The probability of participation is modelled as:

$$P_i = \frac{e^{Z_i}}{1 + e^{Z_i}}$$

where Pi is the probability that Yi takes the value 1 and then (1 – Pi) is the probability that Yi is 0 and e is the exponential constant. In the analysis, explanatory variables like age of the farmer, number of years of schooling, experience in farming, unitary or joint type of family, category of the farmers with dummy 1 if SC/ST, 0 otherwise, distance to market, and extension service were considered.

## RESULTS AND DISCUSSION

The farmers registered with the e-NAM markets in states are provided in Figure 1. The large number of farmers are registered in states like Uttar Pradesh and Madhya Pradesh with more than 30 lakh farm household population. States like Telangana and Madhya Pradesh farmers account for 30 per cent of their state farmer population. Proportionally small participation can be seen

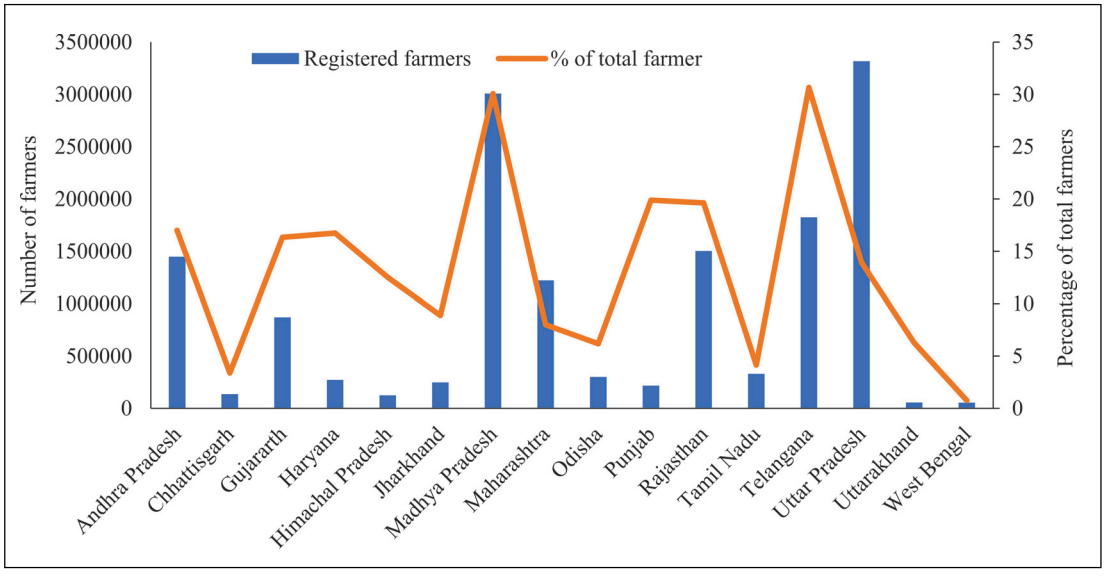


**Figure 1.** Registered farmers participation under e-NAM (as on October, 2022)

from states like West Bengal, Chhattisgarh and Tamil Nadu with less than 5 per cent of farm households registered in the e-Nam. On an average about 1.7 crore i.e. 12 per cent of the farmers in India are registered with e-NAM, indicates the scope for reaching the large base of population involved in agriculture.

The basic socio-economic characteristics of the participants are highly educated with 22 per cent of them completing graduation and another 38 per cent having studied up to high school. Only 13 per cent of the illiterates could sell in the electronic market. Most of the respondents have obtained high school or higher education in selected area. Average family size of 7 to 8 members and having 30 years of experience in the farming. A quarter of farmers belong to social class of SC/ST in e-market participants and around 1/5$^{th}$ is in same category of non-participants. The financial service availability specially in the form of short-term loans under KCC for 35 and 39 per cent in participants and non-participants respectively. Again, a quarter of respondents have membership in cooperative societies. The land holding pattern of sample farmers shows that small and marginal farmers constitute around 50 per cent of the respondents with mean land holding of 1.7 acre for marginal and 3.8 acres for small farmers in e-market participants. Non-participants are marginally smallholding compare to e-market participants with mean holding of being 5 acres and 5.5 acres for non-participants and participants respectively.

**Awareness about e-marketing operations**

The extent of awareness about different processes and components of the e–marketing among the participating farmers were recorded (Table 1). Results shows that 69 per cent of famers aware of computerised entry at the gate of market. The first step in e-marketing starts with computerised entry at the gate to record the information about the farmer, commodity, quantity and quality of produce bought for sale. However, only 45 per cent of the farmers aware that the computerised gate entry is mandatory for the sale in market. In Chitradurga 78 per cent of the farmers and in Kurnool 60 per cent of famers aware that higher price bidder will win the auction. The results of bidding announce at a specified time is known to farmers in larger proportion. These results were in consistent with Pavitra et al., (2018); Chengappa et al., (2012). Online transaction of payment to farmers bank account is another feature introduced for the purpose of ease process and transparency. In Karnataka 45 per cent of the farmers have availed this facility but in Andhra Pradesh only 13 per cent of the farmers had online transaction with bank account. The satisfaction with the e-marketing process by farmers reveals that 61 per cent of Kurnool farmers and 73 per cent of Chitradurga farmers are highly satisfied with the process of e-auction and 23 per cent and 8 per cent farmers in Kurnool and Chitradurga are not satisfied with the process respectively. Similar results are reported by Raju et al., (2022) on awareness of e-NAM.

**Table 1.** Awareness about e-marketing operations by farmers (%)

| Particulars | Kurnool | Chitradurga | Overall |
|---|---|---|---|
| Computerized entry at the gate | 63.33 | 75.00 | 69.12 |
| Computerized entry at the gate is mandatory | 40.00 | 50.00 | 45.0 |
| Highest bidder will win the bid | 60.00 | 78.33 | 69.12 |
| Bid results declared at specified time | 68.33 | 73.33 | 70.5 |
| Direct payment to bank account through on-line system | 13.33 | 45.00 | 29.13 |
| Opinion about e-auction process | | | |
| Highly satisfied | 61.67 | 73.67 | 67.67 |
| Satisfied | 15.00 | 18 | 16.5 |
| Not satisfied | 23.33 | 8.33 | 15.4 |

e-marketing of the commodities in this process need some infrastructure facilities under different processes. Study looks at, what extent of farmers are satisfied with these facilities developed in the respective regulated markets (Table 2). Overall infrastructure facilities are in poor condition with lot of variation in different facilities available. Majority of the farmers satisfied with the facilities available in terms of infrastructure in bidding and e-auction process, which requires computers, cabins, electronic displays and internet facilities. Overall, 70 per cent farmers consented with drying facility in the market, so that excess moisture in commodity can be dried up before sale. Quality assaying is major feature of the electronic market, which specifies the quality of the produce available to traders from other markets by displaying the different quality parameters of the goods. This facility is comparatively better in Chitradurga (76%) than in Kurnool (50%). To ease the sale of produce, the products need to be segregated by grading, to fetch price based on specified grades. Around 45 per cent of farmers satisfied with the facilities of grading available in the market. The sorting and soil testing facilities were minimal in both the district markets. Similar results are reported by Yadav et al., (2023) in a study conducted at AP and Telangana.

**Table 2.** Farmers reporting extent of infrastructure available in market (%)

| Infrastructure facilities | Kurnool | Chitradurga | Overall |
|---|---|---|---|
| Online bid management | 70.00(42) | 85.00(51) | 77.50(93) |
| e-auction facility | 68.33(41) | 80.00(48) | 74.17(89) |
| Commodity drying facility | 75.00(45) | 66.67(40) | 70.83(85) |
| Quality Assaying facility | 50.00(30) | 76.67(46) | 63.33(76) |
| Product cleaning facility | 50.00(30) | 73.33(44) | 61.67(74) |
| Produce grading facility | 38.33(23) | 53.33(32) | 45.83(55) |
| Grain storage | 33.33(20) | 53.33(32) | 43.33(52) |
| Produce sorting facility | 26.67(16) | 35.00(21) | 30.83(37) |
| Soil testing facility | 20.00(12) | 28.33(17) | 24.17(29) |

*****Figures in parenthesis indicates number of farmers

**Factors Influencing farmers participation in e-marketing**

To study the determinants which influence the farmer's participation in electronic marketing, the information on socio-economic, physical and institutional factors were selected (Table 3). Logit regression analysis was employed to analyse the factors which determine the farmers' participation in Kurnool and Chitradurga. The parameters considered were age, education, farming experience, farm size and access to extension service had a positive effect on the participation, while type of family and distance to market, land holding and access to extension services.

The estimated odds ratio indicated that as the distance to market increase by 1 km his probability of participation in e-

**Table 3.** Factors determine participation in e-marketing of agricultural commodities

| Variables | Odds Ratio | | |
|---|---|---|---|
| | Kurnool (N=120) | Chitradurga (N=120) | Overall (N=240) |
| Age (Years) | 1.011(0.055) | 0.747***(0.082) | 0.952(0.044) |
| Education (Years) | 1.017(0.061) | 1.046(0.106) | 1.053(0.049) |
| Experience (Years) | 1.005(0.053) | 1.286***(0.122) | 1.063(0.046) |
| Family type (Joint family = 1, Otherwise = 0) | 0.529(0.262) | 1.573(0.945) | 0.670(0.231) |
| Distance to market (km) | 0.911**(0.048) | 0.697***(0.049) | 0.832***(0.030) |
| Landholding size (ha) | 1.189**(0.107) | 1.160***(0.101) | 1.116***(0.060) |
| Access to extension service (Yes = 1, No = 0) | 5.334***(2.637) | 5.758***(3.359) | 4.292***(1.385) |
| Constant | 0.187(0.339) | 6103.39***(20757.2) | 2.389(3.326) |
| Observations | 120 | 120 | 240 |

*Note:* values in the parenthesis indicates standard error, ***, ** significance at 1% and 5% respectively

marketing reduces by 9 per cent, since longer distant farmers participation is constrained by transportation cost and facilities. Farm size of the farmers had positive relation along with access to extension service being major factor to influencing participation (Gautam et al., 2022), therefore dissemination activities need to gear up for the further implementation participation in e-marketing. However in case of Karnataka the parameters like age and experience shows significant positive influence. Age had negative relation as the age increase by 1 year the participation in e-marketing reduces by 26 per cent. Whereas experience had positive effect with increases in this adds participation in electronic market. Participation increases with increase in the land holding among the farmers significantly. These results were in accordance with Chengappa et al., (2012) & Aggarwal et al., (2017).

## CONCLUSION

Awareness about e-marketing process was low among all the stakeholders. The infrastructure on quality assaying, storage facility needs to be improved for further augmenting the ease of commodity flow in market and larger participation by different stakeholders. Distance to market, farm size and access to extension services were the major parameters having significant influence on e-market participation. This will break up the jinks of Fair Average Quality (FAQ), average price of the produce. This will makes farmers to go for quality food production for realizing premium prices. Measures must be taken to disseminate information through use of innovative communication tools by respective agencies to create awareness among farmers, traders and other stakeholders. Further, involvement of institutions like state department of agriculture, horticulture, KVKs, SAUs must work together at grassroots level to create awareness about the process among farmers.

## REFERENCES

Aggarwal, N., Jain, S., & Narayanan, S. (2017). The long road to transformation of agricultural markets in India: Lessons from Karnataka. *Economic & Political Weekly*, *52*(41), 47-55.

Bisen, J., & Kumar, R. (2018). Agricultural marketing reforms and e-national agricultural market (e-NAM) in India: a review. *Agricultural Economics Research Review, 31*, 167-176.

Chand, R. (2016). e-platform for national agricultural market. *Economic and Political Weekly, 51*(28), 15-18.

Chengappa, P. G., Arun, M., Yadava, C. G., & Prasanna Kumar, H. M. (2012). IT application in agricultural marketing service delivery-electronic tender system in regulated markets. *Agricultural Economics Research Review*, *25*(347-2016-17062), 359-372.

Dey, K. (2016). National agricultural market rationale, roll-out and ramifications, *Economic and Political Weekly*, *51*(19), 35-39.

Gautam, S., Srivastava, A. B., & Bohra, D. (2022). Factors constraining farmer's adoption of the e-national agriculture market (eNAM) in Sultanpur District of Uttar Pradesh. *Asian Journal of Agricultural Extension, Economics & Sociology*, *40*(12), 501-506.

GoI (Government of India). (2016). Agricultural statistics at a glance. Ministry of Agriculture and Farmers Welfare, New Delhi.

Nuthalapati, C. S. R., Bhatt, Y., & Beero, S. K. (2020). Is the electronic market the way forward to overcome market failures in agriculture? *Economic & Political Weekly*, *41*(38), 52-60.

Pavithra, S., Gracy, C. P., Saxena, R., & Patil, G. G. (2018). Innovations in agricultural marketing: a case study of e-tendering system in Karnataka, India. *Agricultural Economics Research Review*, *31*(347-2018-3189), 53-64.

Purohit, P. (2016). Measurement of regulations of the agricultural produce markets. *Economic & Political Weekly*, *51*(28), 37.

Raju, M. S., Devy, M. R., & Gopal, P. S. (2022). Knowledge of farmers on functioning of e-NAM. *Indian Journal of Extension Education, 58*(2), 26-29.

Reddy, A. A. (2018). Electronic national agricultural markets: the way forward. *Current Science*, 115(5), 826-837.

Roy, D., Joshi, P. K., & Chandra, R. (2017). Elements of a national agricultural market in India. In: Mani G., Joshi P., Ashok M. (eds) *Financing Agriculture Value Chains in India* (pp. 211-238). Springer, Singapore.

Yadav, M. M., Husain, A. S., & Srinivasaiah, L. (2023). Utilization of e-NAM facilities and services by farmers in Telangana. *Indian Journal of Extension Education*, *59*(1), 96-100.