

AWARENESS AND SATISFACTION ABOUT ELECTRONIC TRADING OF AGRICULTURAL PRODUCE AMONG THE FARMERS IN MAHARASHTRA

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Abstract: A Purposively study was conducted to investigate mainly the awareness and satisfaction level about eTrading of agricultural produce among the farmers of Maharashtra state. Apart from the main aim, this research article also examines the exact constraints faced by the farmers while trading using the eTrading platform. Preference towards traditional or electronic trading systems was tried to assess. A directional hypothesis is undertaken to determine the level of significance of variables in the study. Following the descriptive research design, an empirical investigation was carried out by collecting the responses from 136 farmer respondents across Maharashtra. Information gathered using Google Form. The questionnaire was developed by seeking expert advice from academics. Using SPSS, Jamovi, and G*Power statistical software packages data analyzes. It finds that farmer from the state face the problem of lack of information and training about various processes involved in electronic trading. The majority of the farmers preferred electronic trading systems. About electronic trading purpose found a significant level of awareness and satisfaction among the farmers. The study is pure in a sense; it provides insights into understanding the status of eTrade policy.

Keywords: Karnataka Model, eTrading System, eNAM, Awareness and Satisfaction.

Introduction

After the independence first time in India, the establishment of the National Agricultural Market (Electronic) in agriculture on the lines of the Karnataka model began to bring a radical change in the agricultural marketing sector. Initially, on an experimental basis, twenty-one agricultural produce markets in eight selected states of the country were integrated under the Electronic National Agricultural Market (ENAM). 1000 Agricultural Produce Market Committees from different states of the country have connected through electronic trading systems until the date. Maharashtra ranks fourth in agricultural production through electronic trading platforms after Rajasthan, Uttar Pradesh, and Gujarat. According to the official statistics of the Maharashtra Agricultural Marketing Board, out of the total 3113 Agricultural Produce Market Committees in the state, 118 Market Committees have been connected to the Electronic Trade Forum (ENAM) till March 2020. Auction of

agricultural commodities is conducted electronically in these Agricultural Produce Market Committees. Maharashtra's agricultural sector plays a significant role in the country's gross national product.

The majority of the population in the state depends on the agricultural sector for direct or indirect employment. In terms of geographical area, Maharashtra is the third largest state in the country. The state has an adequate irrigation facility due to which large-scale commercial farming is practiced. However, Maharashtra has reported the highest number of farmer suicides after Andhra Pradesh and Karnataka (Mishra, 2014). The Electronic National Agricultural Market (eNAM) was brought into the picture with the noble aim of abolishing the fragmentation of markets, improving trader-dominated exploitative systems by reducing the chain of trade intermediaries, and increasing farmers' income through price discovery fairly and transparently. Equal opportunities are provided to all sections of society in terms of buying and selling agricultural commodities. The revolutionized eTrading System (eNAM) has given higher market prices for agricultural commodities, but it was necessary to test whether there is awareness among the farmers about the e-auction/e-trading process. Some of the farmers in Maharashtra are selling their agricultural products using electronic trading systems. This research paper aims to study whether they are satisfied with this modern trading system. Looking at the tendency of farmers towards traditional or electronic trading systems while trading through electronic trading systems, an attempt has been made to get information about the problems faced by the farmers while dealing at electronic trading platforms.

Review of Literature

Performance and progress of Indian Agriculture since Independence author analyzes sources of agricultural growth and determinants of agricultural production. The decomposition test was used to analyze sources of agricultural growth and the production function approach, determinants of agricultural production over the period 1950-51 through 2005-06. It indicates that there is scope to increase both net sown area and gross sown area. After observing this study, production and yield instability declined for almost all crops during the post-reform period while area instability increased in the same period. Further indicates that instability in the area became a major responsible factor for production instability (Tripathi & Prasad, 2010). Karnataka has been a forerunner among states in reforming agricultural output markets. Its efforts can be understood as belonging to two phases. The first phase (2006–11) focused on amending the Agricultural Produce Market

Committee (APMC) Act based on the Model Act 2003 and establishing an electronic platform to support trading. The second phase (since 2011) represents a more holistic approach that combines more substantive legal-institutional reform with automation and unification—the Karnataka Model, as we know it today (Aggarwal et al., 2017). In tracking the revolutionary changes in the Indian agricultural sector, it is quite clear that technology, institutions, and markets have had a crucial role to play. Agricultural growth in India is important to address the food-security concerns and improve farm income and overall economic growth. Things on the agricultural front have begun to change in India, but at a somewhat slower pace than other countries now; India is in a much better position to deal with the food-security issues than when it launched economic reforms growth potential of this sector. The emerging structural changes in the agro system are in favor of the growth of high-value agriculture. It will require a long-term vision and strategic thinking to harness the growth potential of this sector (Gulati & Ganguly, 2010) Process of achieving the transformation, there is a need to address the Strategies and approaches for sustainable agricultural development through Digital approaches for secondary agriculture (organic farming), and adoption of Smart approaches for technology Assessment and dissemination. Good Convergence models need to be developed for economic prosperity. Technological Interventions for Climate Smart Agriculture Initiatives for Food and Nutritional Security for Rural Communities should be prioritized in terms of farming systems for nutrition (Kumar, n.d.) There was a slow but definite increase in the adoption of eNAM by the stakeholders. The econometric results show that there has been an increase in prices received by the farmers, and more markets have linked to eNAM due to the introduction of e-auction. Other benefits of eNAM include timely online payment of sale proceeds to the farmer's bank account and reduced chances of collusion among traders. However, on the flip side, due to lack of quick assaying facilities, participation of distant traders has not picked up, which has resulted in no significant increase in competition. There is a need to increase the stakeholders' participation by forming farmer's groups, private sector participation in the maintenance of eNAM, convincing the traders and commission agents to use eNAM. Linking warehouses and rural periodical markets to eNAM to increase the scale, scope, and efficiency of market operations (Reddy & Mehjabeen, 2019) Behavior-centric, field-based, data-driven methodology to design effective auction mechanisms online agri-platforms to enhance farmers' income. The methodology accounts for important operational and behavioral considerations to ensure successful auction design in resource-constrained environments. By

studying Karnataka model, author design, analyze, and implement a new two-stage auction on the State's agro platform for a major lentils market. The difference-in-differences analysis demonstrates significant revenue gain for over 10,000 smallholder farmers traded in the market in a matter of three months the methods introduced in this paper can provide generally applicable knowledge to researchers and platform designers as they continue to enhance the design of agri-platforms to improve the livelihood of smallholder farmers (Levi et al., n.d.) Agribusiness exhibiting is constrained by the States as indicated by their agri-advancing bearings, under which the State is divided into a couple of market zones, all of which is overseen by an alternate Agricultural Produce Marketing Committee (APMC). e-NAM addresses these challenges by making a united market through the web trading stage, both at State and National measurement, and advances consistency, streamlining frameworks over the planned markets, removing information asymmetry among buyers and sellers, and advancing continuous esteem divergence. In the perspective of genuine premium and supply, propels straightforwardness in the deal process, and access to the nation over publicize for the agriculturist, with costs, with nature of his convey an online portion and openness of better quality make and at progressively reasonable expenses to the customer(Nedumaran & M, 2019). Relevant studies on eTrading systems including post-independence development and performance of Indian agricultural sector, long time to transform Indian agricultural market, digital transformation of Indian agricultural sector, impact of eNAM on improving farmers' income, problems eNAM, have already been done. However, awareness and satisfaction among farmers regarding eNAM have not yet been studied.

Conceptual Framework and Hypothesis Formulation

Sustainable development can occur only when Agricultural produce cultivators, like any other industrial producers in the corporate sector, can get net positive returns from agribusiness. A market is a place where agricultural produce is transacted and the price for the agricultural produce is ascertained, resulting in the total value farmer-producer fetches has been determined. Since the realization of value for agricultural production depends upon an agricultural market and its efficiency. It ensures an urgent need to look after the existing market structure of the country and brings a more effective and competitive marketing environment. Achieved with improved productivity and reduced cost of cultivation, production can drive agricultural growth, farmers' welfare, productive employment, and economic prosperity in the country's agricultural sector. Organized wholesale marketing in

the country is promoted through a network of regulated markets set up under the States' Agricultural Produce Marketing (Regulation) Acts. These market structures aim to regulate and attain transparency in transactions and transfer remunerative prices to the farmer-producer. Over time, these markets have primarily produced exploitative and monopolistic practices, not satisfying the intended objectives. This is neither advantageous to the farmers nor serves well the interests of the consumers. These issues can be addressed by changing the traditional market structure and its regulatory framework and introducing more liberal and progressive laws that allow free competition, promote transparency, facilitate the flow of commodities across space and time, and encourages the operation of multiple marketing channels market players. The Model Act, 2003 and Rules, 2007 have contributed significantly in opening the doors to alternative marketing channels, and many shortcomings were visible during the last 14 years. Hence the Union Government operationalized the electronic National Agricultural Market (e-NAM) in this regard. The Electronic National Agricultural Market (eNAM) includes several technology-driven facilitations that address the diverse and complex marketing issues of agricultural products. Hence eNAM has a definite potential to become a game-changer in the agricultural marketing scene. The concept of electronic trading means trading of notified agricultural produce, including livestock in which registration, auctioning, billing, booking, contracting, negotiating, information exchanging, record keeping, and other connected activities are done electronically on the computer network or internet. Electronic trading platform means electronic platform set up either by State Government/ UT Administration or its agencies or a person licensed under Section 54 for conducting trading in notified agricultural produce including livestock through electronic media or by any means of communication in which registration, buying, and selling, billing, booking, contracting and negotiating are carried out online through computer network/ internet or any other such electronic device.

National Agriculture Market (NAM) means an integrated market, without prejudice to any law for the time being in force, where buying and selling of notified agricultural produce including livestock and activities incidental to that are carried out in India possessing marketing utility across time and space." (*APLM_ACT 2017.Pdf*, n.d.) From 2014 onwards, research on various aspects of eNAM has been conducted in different country states. Tamil Nadu, Andhra Pradesh, Kerala, and Maharashtra have dramatically increased Internet penetration. The massive adoption of internet service has led to remarkable progress in all areas of Maharashtra. Most of the services in the state are being implemented through an

electronic system in the country. eNAM has also made great strides in agricultural marketing (The Hindu, Business Line, Jan. 2018).

Objectives

1. To study the awareness level among the farmers in respect of selling agricultural produce using eNAM for better price discovery.
2. To identify the issues and constraints facing the farmers while selling their agricultural produce at eNAM.
3. To know the preference/support of farmers towards the electronic trading system.
4. To study the satisfaction level among the farmers in respect of selling of agricultural produce using eNAM for value realization to their farm produce. Based on this information, related to the context of eTrading and its adoption, some hypotheses have been proposed in this research article.

H1: There is a significant level of awareness and satisfaction among the farmers regarding selling agricultural produce using eNAM for better price discovery.

H0: There is not a significant level of awareness and satisfaction among the farmers regarding selling agricultural produce using eNAM for better price discovery.

In the agricultural sector, considering the productivity and progress of the state, there has still been no success in reducing farmer suicides. The hypothesis has been formulated based on the fact that it is looking different at first sight.

Research Methodology

The present study aims to assess mainly the awareness and satisfaction level about eTrading agricultural produce among the farming community within Maharashtra. Hence we undertake quantitative analysis of collected data. Due to COVID-19, pandemic data has been collected through qualitatively developed questionnaires containing closed-ended binary and multiple-choice questions. As collected data is in the form of non-metric nature, appropriate statistical tools and techniques were used for inference. A questionnaire was circulated among the farmer respondents across the various districts of Maharashtra utilizing the google survey platform. Data collection was completed during April and May 2021. The random sampling technique is used because it ensures data accuracy for developing the questionnaire expert advice taken from academicians and Agricultural Produce Market Committee (APMC) officials. More than 200 questionnaires were circulated among the farmers to conduct this study, out of which 136 responses (69 % approximately) correctly filled out responses were received. Details are listed in Table.1. Finally, to analyze the data collected through the

questionnaires and test hypotheses undertaken, SPSS (Version) 25.0 and Jamovi Statistical Software packages were used

Table. 1

Demographic Profile of Respondents

Age	Educational Qualification				Total
	Primary	Secondary	Higher Secondary	Graduate and above	
18 To 25	0	0	5	15	20
25 To 30	0	1	1	9	11
Above 30	9	12	35	49	105
Total	9	13	41	73	136

Data Analysis and Results

The attempt has been made to infer the level of awareness by asking few questions, firstly trying to determine the frequency of farmers who sell their surplus yield in agricultural produce market committees (APMCs).

Table 2 gives detailed information about this

Table 2.

	Frequency	Percent
Yes	111	81.6
No	25	18.4
Total	136	100.0

Majority of the farm producers selling their surplus yield in APMCs. Farmers selling their agricultural produce by using the e trading system are further assessed. Out of which 84.6 % farmers are not selling their produce using eTrading system. Table 3. gives detailed information about this:

Table 3.

	Frequency	Percent
Yes	17	15.4
No	94	84.6
Total	111	100.0

As maximum farmers are not choosing eTrading System for selling their agricultural produce, the problems and constraints faced by them are lack of information about electronic trading process followed by information asymmetry and lack of hands-on training to stakeholders for operating with eNAM.

Table 4. Provides a better understanding of the observations:

Table 4.

	Frequency	Percent
Information Asymmetry	40	29.4
Lack of Information about Electronic Trading Process	56	41.2
Lack of Training	22	16.2
Low level of Technological Literacy	18	13.2
Total	136	100.0

Social media has proved to be decisive for getting information about eTrading. A very nominal portion of the farming community got informed about eTrading through print media like pamphlets and brochures, but most farmers got information through digital media like audiovisual aid, electronic/ social media.

Table 5. gives better clarity about the same:

Table 5.

	Frequency	Percent
Pamphlets	10	7.4
Information Broachers	12	8.8
Audio- Visual Aids.	37	27.2
Electronic/ Social Media	77	56.6
Total	136	100.0

Technology-driven society nowadays preferred digital movies agriculture marketing sector is not an exception to this. It is observed that the majority of the farmers are not likely interested in trading by using the eTrading system, but still, farmers are significantly aware of the eTrade system. Just because of some problems encountered, farmers feel not comfortable with eTrade.

Table 6.

**Awareness About The Trading of Agricultural Produce
Using eTrading Platform**

	Freq.	Percent	Cumulative Percent
Somewhat Aware	73	53.7	53.7
Extremely Aware	5	3.7	57.4
Not at all	58	42.6	100.0
Total	136	100.0	

Awareness

Awareness about the trading of Agricultural Produce using e-Trading platform



Analyzing the nominal data portion of farmers who traded their agricultural produce at eTrading Platform asked them further about price realization for agricultural produce. An approximately 65 % farmer who utilizes the eTrade forum expressed their concern about the significant affect on real-time price discovery.

In Table 7. Information about the overall affect given as under:

Table 7.

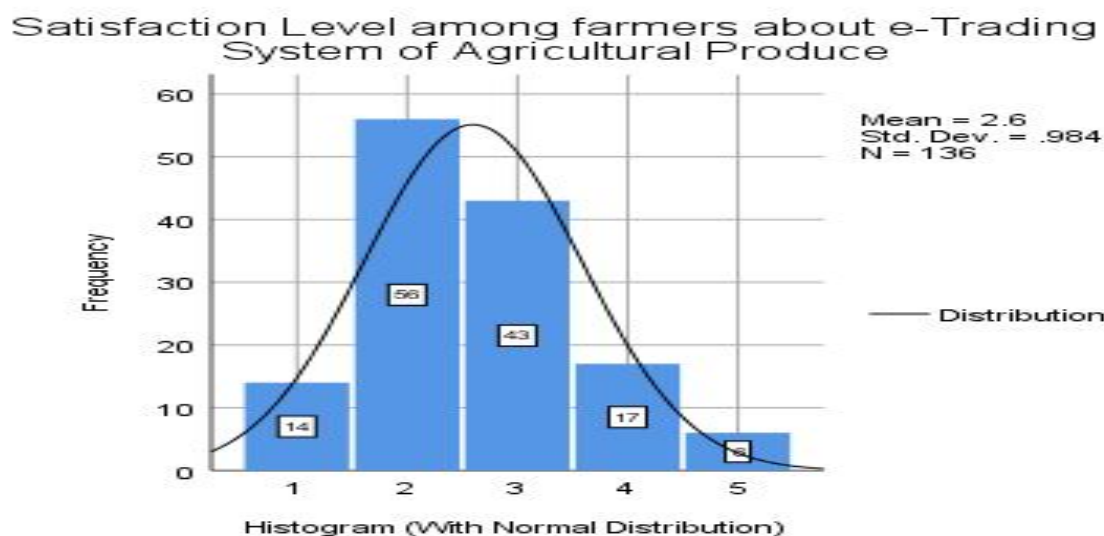
	Frequency	Percent
Not Affecting	6	36.0
Minor Affect	5	29.4
Moderate Affect	2	14.7
Major Affect	4	19.9
Total	17	100.0

Finally, getting clarity about overall awareness satisfaction is assessed, and it is found that the farmers feel more satisfied with trading with the eTrading Platform.

Table 8.

Satisfaction About eTrading System of Agricultural Produce

	Not at all Satisfied	Somewhat Satisfied	Uncertain	Very Satisfied	Extremely Satisfied	Total
Frequency	14	56	43	17	6	136
Percent	10.3	41.2	31.6	12.5	4.4	100.0



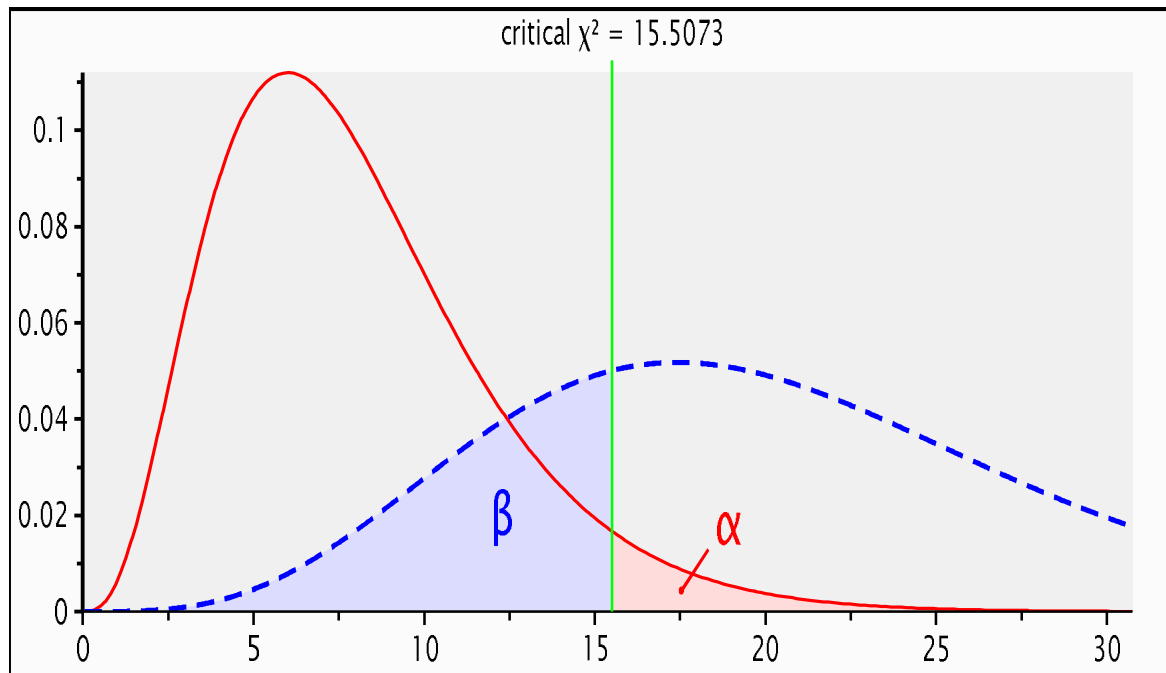
Though farmers are much aware of and considerably satisfied with the eTrading System, even eTrading allows farmers to get an opportunity to draw a better and real-time price for their farm produce—Table 9. Shows still the farmers have likeliness towards the Electronic Trading System because of some constraints.

Table 9

	Frequency	Percent
Traditional Trading System	38	27.9
Electronic Trading System	98	72.1
Total	136	100.0

Hypothesis Testing

Data collected is in the form of non-metric (nominal/ordinal). Apart from knowing the central tendency of data, an independent sample chi-square test for goodness of fit is applied as a statistical measure to test formulated hypotheses. After analyzing the data, it is already observed that farmers in Maharashtra are aware and satisfied with the eTrading system of the agricultural system. The statistical application ensures that whether it is significant or not. The following graph is obtained after analyzing the data using G*PowerSoftware



Independent sample chi-square test of goodness of fit was run for assessing significance level of awareness and satisfaction among the farmers regarding the selling of agricultural produce using the eTrading system for better price discovery by comparing the observed frequency distribution to expected frequency distribution. Analyzing the sample data, it is understood that even frequency was found in terms of percentage from observation Critical χ^2 value (15.5073) is compared with the obtained χ^2 value (20.9) at α (0.05) level with $df = 8$ and considering the medium effect size (0.30) test has produced the power ($1-\beta$ err prob.) 0.6952749 as obtained χ^2 value $>$ Critical χ^2 value statistically we failed to accept H_0 The P-Value is less than 0.05 (i.e., 0.007) H_1 is accepted, which state that there is a significant level of awareness and satisfaction among the farmers in respect of selling of agricultural produce using eNAM for better price discovery.

Discussion

An analysis of the demographic profile reveals that there are relatively more farmers over the age of 30. Also, profoundly educated farmers are more in representation. Most of the farmers sell their produce in the Agricultural Produce Market Committee. Most of the farmers believe that the e-trading system gives higher returns to agricultural commodities. It was found that there was sufficient awareness among the producers about the trading system. Problems like lack of information about the electronic trading process, information

asymmetry, etc., suggest that the acceptance rate of the trading system is low among farmers. Even so, the farmer in Maharashtra seems to be supporting the electronic trading system. Due to the non-availability of enough physical facilities at the Agricultural Produce Market Committee level, sufficient information on agricultural marketing is not disseminated. The Union Ministry of Agriculture and Farmers Welfare makes reasonable efforts to disseminate information about the e-commerce system, but this is not happening at the state level. An electronic trading system was introduced to improve the design of traders dominated exploitative system, abolishing fragmentation in the APMC market, finding prices fairly and transparently, establishing a competitive marketing environment, etc. Majority of the farmers in Maharashtra are cultivating food grains, Oilseeds and their products were sold at eNAM Linked APMCs They received good returns for their farm produce. Farmers across Maharashtra are significantly aware and satisfied about eTrading of agricultural produce, as they were educated enough to grab the opportunity to realize more value for their agricultural produce.

Limitations

Expected responses to conduct scientific research could not be obtained from farmers during the Covid-19 epidemic. Farmers who were not comfortable with filling out the questionnaires in Google Form could not respond appropriately. As the study was conducted only in Maharashtra, the findings in the survey will not be applicable outside the state. Since the information collected is non-parametric in nature, objectives could be justified by analyzing the data using limited statistical tools and techniques.

Conclusion

The main objective was to check the farmers' level of awareness and satisfaction about the eTrading System in a representative manner. The hypothesis made earlier, data collected so far for this were failed to accept the same and this was proved using statistical tools and techniques. This means that farmers are significantly aware and satisfied about the eTrading System. There is a need to provide comprehensive information and training to the farmers on various processes involved in the eTrading System and for this, required to conduct massive training and awareness programs at the state government level. As real-time price discovery is made more efficiently and effectively through the eTrading System, hence this trading system has become most preferred by the farmers in the state. This research article emphasizes the need for the State Agriculture ministry and Marketing Board to make extensive efforts to promote the eTrading System.

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