AN EMPIRICAL ANALYSIS ON THE ADOPTION OF E-NAM AND TRADING BEHAVIOR OF FARMERS

PROJECT REPORT ON

SUBMITTED BY

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UNDER THE GUIDANCE OF

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IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

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DEPARTMENT OF COMMERCE

AVINASHILINGAM INSTITUTE FOR HOME SCIENCE AND HIGHER EDUCATION FOR WOMEN

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MAY- 2022

CERTIFICATE

CERTIFICATE

This is to certify that the project entitled **"AN EMPIRICAL ANALYSIS ON THE ADOPTION OF E-NAM AND TRADING BEHAVIOR OF FARMERS"** submitted to the Department of Commerce, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, in partial fulfilment of the requirements for the award of the degree of **Master of Commerce with Computer Applications** is the record of original project work done by **S. NOVIYA,** during the period of her study, under my supervision and guidance.

Signature of Supervisor _____

Viva-Voce examination held on _____

_____ _____

Signature of Head of the Department **Signature of External Examiner**

DECLARATION

DECLARATION

I hereby declare that this project work entitled **" AN EMPIRICAL ANALYSIS ON THE ADOPTION OF E-NAM AND TRADING BEHAVIOR OF FARMERS"** submitted to Department of Commerce, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, in partial fulfilment of the requirements for the award of the **Degree of Master of Commerce with Computer Applications** is the record of the original project work done by **S.NOVIYA** during the period of study, under the supervision and guidance of **Dr. A.R. RIHANA BANU, M.COM(CA)., Ph.D.. SET., Assistant professor,** Department of Commerce.

Place: Coimbatore

Date:

Signature of the Guide **Signature of the Candidate**

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ABSTRACT

India is an agrarian economy having varied agro-climatic zones suitable for cultivation of wide range of crops such as cereals, pulses, horticultural crops, medicinal and aromatic plants, flowers etc. In India, agriculture remains a major source of livelihood. The present research aims to analyse the perception and attitudes of farmers about operation and benefits of e-nam. This e-nam platform provides more sale options to farmers, increase direct access to markets and reduce intermediation costs. The study considered five dimensions namely effectiveness, attitudes, trading behavior, facilitating conditions and perceived ease of use. The data required for the study has been selected through interview schedule from 103 respondents by adopting convenient sampling techniques. The collected data was analysed with the help of appropriate tools namely Percentage Analysis, Garrett Ranking, Cross Tabulation, Factor Analysis, ANOVA, Hetrotrait and Multitrait. The study concludes that benefits of using e-nam for farmers get better price, time saving and reduce transaction cost for buyers. The major problems faced by farmers on using e-nam are poor net connectivity, no proper guidance, poor infrastructure and market is far away.

INTRODUCTION

CHAPTER I

INTRODUCTION

In India agriculture marketing activities are regulated by Agriculture produce market committee (APMC), which is established and regulated by the respective State Agricultural Produce Market Committee Acts (State APMC Act). The APMC does not allow the traders to buy from the farmers outside of the APMC, resulting in increase of marketing cost. Agricultural markets in India are underdeveloped and imperfect, and lack both horizontal and vertical integration. This reduces producers share in consumers rupee, especially in the case of perishable commodities and the buyer ends up paying higher prices for the produce. e-NAM promotes uniformity, streamlining of procedures across the integrated markets, removes the information gap between buyers and sellers and promotes real time price discovery based on actual demand and supply in the market. Price discovery is not transparent and underpricing is quite common in these markets. Lack of infrastructure, transportation, grading and adequate standards are other major problems. To solve these problems, the Government of India launched Electronic National Agricultural Market. National Agriculture Market (e NAM) is a pan-India electronic trading portal which networks the existing APMC mandis to create a unified national market for agricultural commodities. Initially it aims to connect all the large 585 APMCs, currently 1,000 mandis across the states have been connected to e-NAM. It was launched by the ministry of agriculture, Government of India on April 14,2016 in 21 mandis of 8 states. It is a virtual market platform linking the existing physical Mandis i.e. APMCs electronically with a theme of "one nation, one market" as eNAM market. E-NAM has a huge potential as it provides the option to the farmer to sell their produce anywhere in India and helps the farmer in increasing his/her income. It is one of the policies of the government for doubling farmers income by 2022. Integration of mandis with the e NAM requires the states/union territories to undertake three reforms namely,

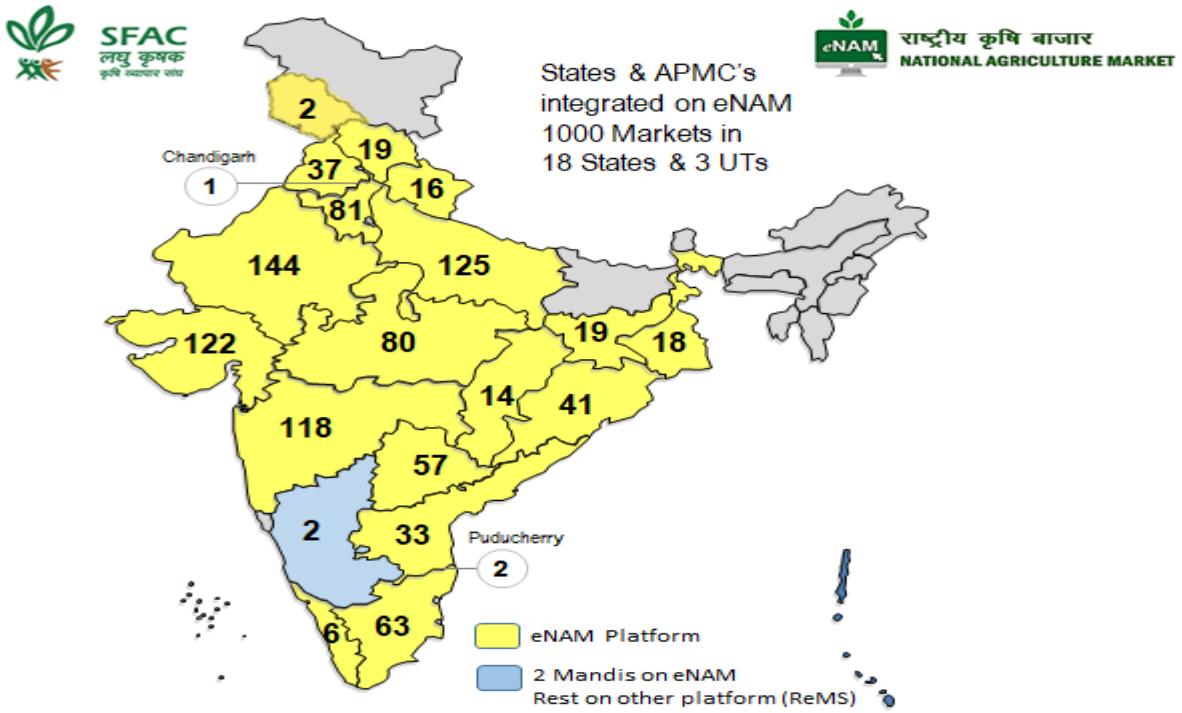
(i) a single trading license to be valid across the state;

(ii) single point levy of market fee across the state: and

(iii) provision for e-auction/e-trading as a mode of price discovery.

1.1 Features of National Agriculture Market Scheme:

- A National e-market platform for transparent sale transactions and price discovery in regulated markets, kisan mandis, warehouses and private markets. Willing States to accordingly enact provision for e-trading in their APMC Act.
- Liberal Licensing of traders / buyers and commission agents by State authorities without any pre-condition of physical presence or possession of shop / premises in the market yard. One license for a trader valid across all markets in the State.
- Harmonization of quality standards of agricultural produce and provisions of assaying (quality testing) infrastructure in every market to enable informed bidding by buyers.
- Restriction of agriculture Produce Marketing Committee's (APMC) jurisdiction to within the APMC market yard / sub yard instead of a geographical area (the market area) at present.
- Single point levy of market fees i.e. on the first wholesale purchase from the farmer. SFAC will implement the national e-platform and will cover 400 and 185 mandis during 2016-17 and 2017-18 respectively. SFAC will develop, operate and maintain the NAM platform with technical support from the Strategic Partner viz. M/s Nagarjuna Fertilizer and Chemicals Limited, who have been selected through an e-procurement process.



1.2 Status of e-NAM in India:

With the aim of promoting uniformity in Agricultural Marketing in India, 1,000 Mandis have been integrated across 18 states and 3 Union Territories. The details of Mandis covered under the following tables.

Table - 1 e-NAM Markets Across India

S. No	State	No. of APMC	Mandis doing Online Trade
1	Andhra Pradesh	33	13
2	Chandigarh	1	1
3	Chhattisgarh	14	0
4	Gujarat	122	4
5	Haryana	81	72
6	Himachal Pradesh	19	2
7	Jammu and Kashmir	2	0
8	Jharkhand	19	0
9	Karnataka	2	0
10	Kerala	6	0
11	Madhya Pradesh	80	1
12	Maharashtra	118	15
13	Odisha	41	5
14	Puducherry	2	0
15	Punjab	37	7
16	Rajasthan	144	85
17	Tamil Nadu	63	2
18	Telangana	57	0
19	Uttar Pradesh	125	13
20	Uttarakhand	16	7
21	West Bengal	18	4
Total Mandis		**1000**	**231**

Source: https://e-NAM.gov.in/web/mandis-online

1.3 Commodities traded under e-NAM:

e-NAM provides a virtual platform to farmers and traders to perform commerce and trade across the states with one nation one market approach. 175 Commodities including food grains, oilseeds, fruits & vegetables, spices etc. are listed in the e-NAM market. Till the 30th June 2020, agricultural produce having total volume of 3.54 crore MT with value of 1,02,529 crores has been traded through e-NAM portal.

Table - 2 Commodities covered under e-NAM

Commodities group	Total Number
Food Grains / Cereals	26
Oilseeds	14
Fruits	31
Vegetables	50
Spices	16
Miscellaneous	38
Total	**175**

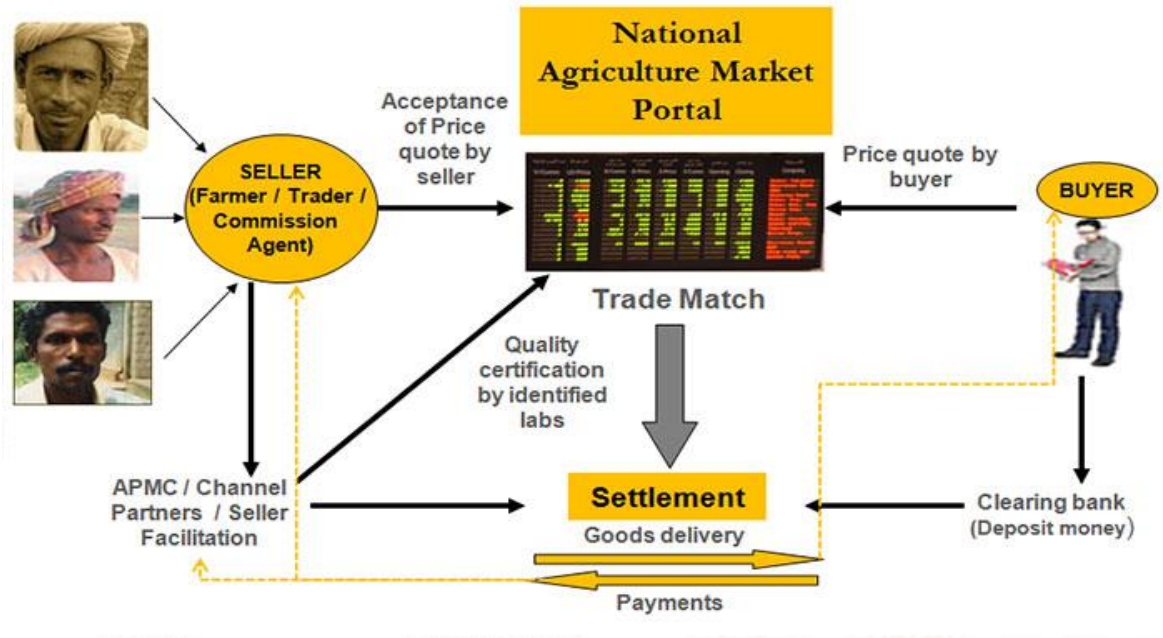
Source: https://e-NAM.gov.in/web/commodity/commodity-list

Table - 3 Commodities traded under e-NAM

S. No	Category	Number of Commodities	Commodities
1	Food Grains / Cereals	26	Arhar, Arhar Dal Split, Bajra, Barley, Basmati rice, Buck Wheat, Chakhao Or Black Rice, Chana Dal Split, Chana whole, Horse Gram, Jowar, Kabuli Chana Whole, Lobia Maize, Masoor whole, Moong Dal Split, Moong whole, Moth, Oats Raw, Paddy, Ragi, Rajma, Urad Dal Split, Urad whole, Wheat, White Peas
2	Oilseeds	14	Castor seed, Cotton Seed, Kusum seed, Linseed, Mustard seed, Neem Seeds, Nigar Seed, Peanut kernel, Pongam seeds, Rapeseed, Sal Seed, Sesame seed, Soyabean, Sunflower seed

3	Fruits	31	Amla, Apple, Apricot, Banana, Ber, Cherry Red / Black, Custard apple, Grapefruit, Grapes, Guava, Jackfruit, Jamun, Kinnow, Lemon, Litchi, Mango, Musk melon, Orange, Papaya, Papaya Raw, Passion Fruit, Peach, Pear, Pineapple, Plum, Pomegranate, Raw Mango, Sapota, Strawberries, Sweet orange, Watermelon
4	Vegetables	50	Aloe Vera, Banana Raw, Beetroot, Bhindi/Okra, Bitter gourd, Bottle gourd, Brinjal, Broccoli/Calabrese, Button Mushroom, Cabbage, Capsicum, Carrots, Cauliflower, Cluster beans, Colocasia vegetable, Coriander leaves, Cucumber, Curry Leaves, Drumstick, Fenugreek Leaves, Garlic, Gherkin, Ginger, Green chillies, Ivy gourd, Jimikand (Suran), Lobia Pods, Mint Leaves, Mustard leaf, Onion, Oyster Mushroom, Pea, Pointed gourd, Potato, Pumpkin, Reddish, Ribbed celery, Ridge Gourd, Safed Petha, Sem, Snake Guard, Spinach, Sponge Gourd, Spring Onion, Sugar Snap Peas, Sweet Corn, Sweet potato, Tapioca, Tinda, Tomato
5	Spices	16	Ajwain, Black Pepper Whole, Cardamoms Whole, Cloves Whole, Coriander whole, Cumin, Dried Raw Mango Slices, Dry Ginger, Fennel seed, Fenugreek seed, Large cardamom, Mace Whole, Poppy Seed, Red chilli, Tejpata,
6	Miscellaneous	38	Anthurium, Areca nut (betel nut), Bamboo, Betel leaves, Carnation, Chhappan Kaddu, Chironji, Chrysanthemum, Coconut, Coconut with Husk, Cotton, Gerbera, Gladiolus, Groundnut with pods, Guar seed, Hilsa, Isabgol, Jaggery, Jute Seeds, Lily, Mahua flower, Mahua Seed, Marigold,

			Nutmeg Whole, Persimmon, Raisins, Raw Cashew nut, Raw Jute, Rittha, Rose Cut Flower, Safed Musli, Saffron, Spray Chrysanthemum, Tamarind, Tender coconut, Tuberose, Tulip, Walnuts Inshell



Source: http://sfacindia.com

Figure 1.1: A working model of e-NAM

1.4 E-NAM Process Flow:

A. Gate Entry:

Trade process flow starts from the Gate entry. Once a farmer entered the market along with his/her commodity, he/she has to inform to the gate and accordingly an electronic gate entry slip is generated. An entry slip consists of lot code (as a sequence of Mandi code-year-month-date-lot of the day), Farmer's name, Mobile Number of the farmer, Village, Commission Agent's name and Company, Commodity, number of Bags, Bag type, Approximate quantity, Vehicle Number, Market/sub market detail, Lot type (primary or secondary sales) and government ID. In this process, Registration is done for the first time mandi visitors.

B. Unloading of Commodity at Auction/Trading Platform and Assaying:

After gate entry, farmer must unload the commodity at the Auction platform. If farmer wish to trade with any particular trader or commission agent in that case on his/her demand the particular commission agent/trader has to be allocated to farmer and the entry has to be made in the gate entry slip, otherwise, farmers can unload their produce in any of the trading platforms. The lot ID (gate entry slip) is displayed on the top of the lot in the trading platform. The Assaying Lab technician from the APMC will visit the lot and collect a minimum of 250grams of the sample of the commodity for assaying. The quantum of sample may vary from 250-500 gm as per the commodity specific assaying requirement. After drawing the sample, the assaying process is completed and the assaying report against the lot number is uploaded to e-NAM website for the next process. However, if the assaying machinery is not available (for some of the commodities like moth and spices) the quality of the commodity is assessed on the basis of a physical examination by traders/commission agents.

C. Generate e-Bidding:

Based on the assaying report, mandi officials generate the e-bidding and fix the maximum bidding time. Traders will be quoting their price electronically for their interested lot. The same will be displayed on the display board at APMC.

D. Bid Declaration:

Once the bidding time is over, a message of the highest bid price is sent to the farmer's registered mobile number or he can view lot number wise final price displayed on the e-display board at APMC. If the farmer accepts the final price, the lot will be allotted to the trader for final purchase. If the farmer does not agree with the price, he/she may again go for e-auction.

E. Weighment of Sold Commodity:

After successful completion of the auction process, the next process is Weighment of the commodity. Weighing of the commodity is done on the electronic weighing machine by the weigh men appointed by the mandi.

F. Generation of Sale Agreement:

Primary bill is generated after weighment. The sale bill contains Trader name and license number, Farmer detail, Commission agent Name and his license number, Agreement number,

Commodity detail, packaging type and weight of the bag, Commodity price, Farmers price, Commission agent fee, Mandi fee etc.

G. Payment to Farmers & Others:

Once the sale bill is generated, the buyer sends the money through RTGS/NEFT/ cash deposit through bank challan. At present farmers are demanding immediate cash, hence, the buyer pays cash to the farmer directly.

H. Gate Exit Pass and Gate Exit:

After successful payment to the farmer, the commodity is handed over to the trader and subsequently the mandi official generates the exit pass which contains gate exit number, exit type, Vehicle number, APMC detail, Trader, lot type, Commodity, lot code, Bag type, number of bag and weight/ total number.

1.5 Statement of the Problem

Agricultural marketing refers to all those processes which relate to taking the agricultural product from the farmers to the consumers. Agricultural marketing includes gathering the agricultural produce, their standardization, and grading, their storage, sending them to the market through various middlemen, selling in the market and arranging the required finance, etc. Even though India is an agricultural country, still its agricultural marketing has been defective. The Indian farmers are unable to get reasonable prices for the products even after their hard work and are fully exploited by the middlemen.

1.6 Objectives of the Study

Following are the specific objectives formulated for this study:

1. To study the awareness of E-NAM among the farmers in Tirupur District.
2. To identify the factor influencing the perception and attitudes of farmers about operation and benefits of E-NAM.
3. To analyse the behavioural intention of farmers towards E-NAM.
4. To find out the challenges faced by farmers in transacting the produce through E-NAM.

1.7 Limitations of the study

- The study is limited to 103 respondents and duration of the study was from December, 2021 to March, 2022.
- This study was conducted in Tiruppur District. The sample was taken on the basis of convenience. Thus, the study only provides an overview in-depth analysis for better understanding of the behaviour.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

2.1 Review of Previous Studies

Dr. Sathyendra Kumar A D (2020) studied the benefits of e-NAM process for the farmers in marketing of commodity and measuring the extent of awareness of eNAM process among the farming community. The study is primary data based study. The data was collected from the farmers who are actively engaged in trading through e-NAM platform in APMC Market yard. The outcome of the study is based on the observations and information on eNAM process flow collected from farmers in the selected APMCs. Total 306 farmers were selected purposively for studying the behaviour of farmers who have gone through electronic trade in the selected States. Simple statistical tools such as frequency, percentage etc. were used to analyze the farmers perception on benefits of eNAM in each process flow. It was found that 67.3 percent of the entire farming community aware about the concept and benefits of eNAM in the study area.

Rika Terano (2015) examined that to investigate the paddy farmer's intention to practices sustainable agriculture and to determine the significant factors that could be used as predictors in having intention to practice sustainable agriculture. A total of 61 paddy farmer household heads were interviewed for this study during the main season of 2013. The coefficient of determination (R2) of multiple regression analysis of 0.76 indicate that proportion of the total variation in paddy farmers intention to practice sustainable agriculture is explained by the following variables; farmers' attitude and perceived behavioral control towards sustainable agriculture, age, number of protection equipment's used, storage method of chemical input, awareness and knowledge of MyGAP/IPM are significant as influential determinants of farmers' intention to adopt sustainable agriculture at 5% level of significant.

S.R. Singh (2020) examined to assess the status of e-NAM implementation with specific focus on technology adoption, operation and infrastructure creation. The data collected was summarized and presented in tabular form for to perform simple statistical tools like averages, percentages etc., so as to arrive at meaningful interpretations. From this study, it can be inferred that the administration of agricultural marketing is carried on by the respective States as per their agri-marketing regulations and every State is further divided into several market areas

monitored by the APMCs. So, as the markets are fragmented even within the State level, to ensure free flow of agricultural trade both at inter-mandi and inter-state levels, e-NAM is the best platform.

C.S.C. Sekhar (2018) conducted a study on the extent of operation, adoption and functioning of e-NAM in few of the major markets. The data includes the primary as well as secondary data analysis. The primary survey was conducted in mandis across three districts of Haryana by the Agricultural Economics Research Centres (AERC), Delhi. The secondary data on prices and market arrivals from AGMARKNET has been used to comparative analysis of the market trends before and after the introduction of e NAM. The AGMARKNET data is collected from various mandis in the country. Most preferred medium of crop sale by farmers during pre NAM period is commission agents.

Ramesh chand (2018) opined that the full benefits from e-NAM can only be realized when a single license for trading is valid across the states, so that farmers can get advantage of competitive environment and selling their produce to anywhere in the country. Urgent reforms are needed to address these inadequacies and check the excesses of middlemen. While encouraging new models that improve the bargaining power of producers and scaling up successful experiments, producers' companies and cooperative marketing societies could be promoted to provide alternative avenues for sale of produce.

Yadav and Sharma (2017) stated that National Agriculture Market will be the game changer for the Indian farming community. They also stated that e-NAM would provide the farmers more options for sale of their produce and increase the accessibility of market to farmers through warehouse based sale and obviates the need to transport the produce to the mandies. However, it will happen when e-NAM become fully operational throughout the country and the eventual goal of 'One Nation One Market' for agricultural produce will become a real.

Sanjay chaudhary (2019) examined the electronic National Agricultural Marketing initiative of the Government of India is emerging as a viable solution to the highly fragmented and inefficient supply chain about agricultural marketing in India. To realize the benefits of eNAM, its high adoption is a prerequisite. In this chapter, the constructs “Performance Expectancy”, “Effort Expectancy”, “Social Influence”, “Facilitating Conditions”, “Behavioural Intention”, “Trust”, and “Cost” of the adoption framework relevant to the Indian agriculture sector are discussed with the support of a pilot study. The relationship between the

adoption factors and intention to adopt is analyzed using analysis of data collected through an opinion survey conducted in the Meerut wholesale market in Uttar Pradesh. It is expected that the study helps in understanding the online behavior of adopters and help bring more and more participants to the National Agricultural Marketing B2B platform for its eventual success.

Anne M. Roubal (2016) examined the barriers for the implementation of electronic benefit transfer (EBT) in farmers' markets. The result of the study show that understanding the main barriers as well as effective strategies for successful implementation of EBT in farmers markets is imperative to realize the full potential of this program. Understanding difficulties from market managers' perspectives is important to inform future policy initiatives to streamline reimbursement at farmers markets.

Yu (2016) conducted a study on the application of electronic commerce in food supply chain and food safety. The authors observed that through combination of food supply chain and electronic commerce, food enterprises can ensure the food safety better and improve the market competitiveness comprehensively.

Sruthi (2015) conducted a study on e- purchasing power of consumers toward food, groceries, fruits and vegetables in Bengaluru city. The e-purchasing behaviour of consumers towards food, groceries, fruits and vegetables was analyzed based on data collected from 120 sample e-purchasers in four areas of Bengaluru city. The consumers' attributes for preference towards e-purchasing was analyzed through Garett's Ranking Method. The results of study revealed that the source of awareness about e-purchasing for considerable per cent of consumers was through friends (39.17%) and advertisement (38.33%).

Gaurav Mishra (2019) examined that to promote uniformity, streamlining of procedures across the integrated agricultural markets. e-NAM aims to reduce information asymmetry between buyers and sellers and facilitate the provision of real-time price discovery. Through a pilot study of the project in Jetalpur mandi, Gujarat, the authors intend to bring out the issues and challenges in adoption and implementation by various stakeholders of e-NAM. The study concludes that for e-NAM's successful adoption, aspects related to observability, relative advantage, compatibility, trialability and complexity are important and should be considered in the design of existing and future e-NAM centres.

Nidhi Dwivedy (2011) examined the challenges faced by the Indian agriculture sector in particular and developing nations in general - illiteracy, poor socioeconomic conditions, lack of technical knowledge and awareness, small land holdings, modernization leading to barren

land and disasters leading to rural poverty, weather-dependent farming systems, low per capita income, underdeveloped physical infrastructures and inefficient bureaucratic procedures associated with the comparatively high cost of agricultural production. Natural disasters and human-induced environmental degradation are closely associated with improved farming systems.

Devesh Roy (2018) analysed several research questions relating to the National Agricultural Market. The analysis shows that barring some low-value cereals, markets for most commodities lack integration. However, subsequent analysis shows that the preparedness for a platform like NAM is quite low on the back end. The back end would require serious large-scale investment for the functioning of NAM comprising warehousing, cold storages, refrigerated vans, laboratories, grading facilities and certification mechanisms, among others. The existing marketing structure under APMC can be incorporated into NAM but significant modifications will be required. For effectiveness and sustainability of NAM, the government has to provide several public goods in the back end such as roads, banking and communication facilities, etc.

Reddy C.R (2007) founded the revenue district of Bellary is an agricultural oriented economy. The net cropped area is accounted for 86.12 per cent of the gross land and 51.74 per cent of the geographical area of 10,50,450 hectares. Of the cultivable land, 64.18 per cent and 35.82 per cent of land is under-rainfed and irrigation respectively. About two-thirds of rural people of 11,25,746 is depended on agriculture. On the application of Regression Analysis to the marketed surplus and production, it is noticed that there is a positive relation the extent of production and sale of farm produce. Paddy and cotton are the principal crops among the food crops and the commercial crops respectively. The rise in the prices of commercial crops (Rs.64.30) is more than in rise in the prices of food crops (Rs.31.32).

2.2 Research Gap

The research study analysed the online selling of agricultural produce through e-NAM portal is expected to give choice to farmers to transact their produce both in physical mandis or through online platform. However, the ease of access to transact the produce through online has enabled the farmers to realize more remunerative prices, reduced transaction costs, more transparency in sale and purchase of produce and prompt payment of sales proceed. Some previous studies did not analyse the perception and attitudes of farmers about operation and

benefits of e-NAM. Therefore, the present study is conducted to fill the gap on the adoption of e-nam and trading behaviour of farmers.

2.3 Summary

By reviewing the various literatures, it is clear that less research is conducted in this area and hence there is vast scope for the study. Most of the research studies the benefits of e-NAM farmers, perception and attitudes of farmers, challenges faced in Indian agricultural sector and barriers for the implementation of electronic benefit transfer (EBT) in farmers' markets. In order to fill up the gap this topic has been selected for the study.

RESEARCH METHODOLOGY

CHAPTER III

RESEARCH METHODOLOGY

Research may be very broadly defined as systematic gathering of data and information. A research methodology involves specific techniques that are adopted in research process to collect, assemble and evaluate data. It is the system of collecting data using various methods. It defines those tools that are used to gather relevant information in a specific research study. Surveys, questionnaires and interviews are the common tools of research. The methodology followed in the current study is discussed under the following heads

3.1 Research design:

3.2 Sample size:

3.3 Study period:

3.4 Method of data collection:

3.5 Tools used for Analysis:

3.1 Research design:

The study undertaken is descriptive in nature. Descriptive research attempts to describe in detail the relationship between various aspects of research problems. So, the adoption of descriptive research has been found very effective in the present study. It attempts to describe systematically a situation, problem, phenomenon, service or programme. It also describes the characteristics of the respondents and the degree of association or relationship between the variables being studied. It helps to make specific predictions**.**

3.2 Sample size:

A sample of 103 farmers were selected for studying the behaviour of farmers who have done trade through electronic platform to understand the benefits of e-NAM and to study the awareness of e-NAM among the farmers.

3.3 Study period:

The study was conducted from December, 2021 to March, 2022. The data collection was done for a period of one month during January, 2022.

3.4 Method of data collection:

The study is based on primary data. The primary data are collected from e-NAM users and non e-NAM users from the farmers in Tirupur district. The survey was based on personal interview schedule of selected farmers who approach the e-NAM mandi for transacting the farm produce. The survey area covered the local farmers in kangeyam.

3.5 Tools used for Analysis:

- Percentage Analysis
- Factor Analysis
- Garrett Ranking
- Cross Tabulation
- ANOVA
- Hetrotrait and Multitrait

3.5.1 Percentage Analysis:

Percentage analysis was used to present the simple summarises of the data about the sample. It is used to show the distribution of the sample. It is important tool used in a study mainly to access the distribution of respondents under each category.

3.5.2 Factor Analysis:

Factor analysis has been used to analysis factor influencing on number of items. Factor analysis attempts to identify variables, or factors, that explain the pattern of correlation within a set of observed variables. Factor analysis to analysis is often used in data reduction to identify a small number of factors that explain most of the variance observed in a number of manifest variables.

3.5.3 Garrett Ranking:

A ranking is a relationship between a set if items search that for any two items, first is either “ranked higher than”, “ranked lower than” or “ranked equal to” the second. Based on the mean the factor has been ranked.

3.5.4 Cross Tabulation:

Cross tabulation is a statistical process that summarises categorical data to create a contingency table. It is also known as cross-tab or contingency table. Cross tabulation report is used to

analyze the relationship between two or more variables. The report has the x-axis as one variable and the y-axis as another variable. This type of analysis is crucial in finding underlying relationships within survey results.

3.5.5 ANOVA:

Analysis of variance is a statistical method used to determine if there is a significant difference between two or more categorical groups by testing for differences of means using variance. Analysis of variance is used for three or more groups of data, to gain information about the relationship between the dependent and independent variables. If no true variance exists between the groups, the ANOVA's F-ratio should equal close to 1.

3.5.6 Hetrotrait and Multitrait:

Discriminant validity assessment has become a generally accepted prerequisite for analysing relationships between latent variables. For variance-based structural equation modelling, such as partial least squares,

- The Fornell-Larcker criterion and
- The examination of cross-loadings are the dominant approaches for evaluating discriminant validity.

ANALYSIS AND INTERPRETATION

CHAPTER IV

ANALYSIS AND INTERPRETATION

Analysis is considered to be an important step in the research work. After the collection of data, the next step is to analyze and interrupt data with the view of arriving at an empirical solution to the problem. The present chapter focuses to study "the adoption of e-NAM and trading behavior of farmers" by adopting various statistical tools like frequency, factor analysis and ranking.

The analysis of the study is presented under the following sections:

I. Socio Economic Profile of the farmers using e-NAM.

II. To study the awareness of e-NAM among the farmers.

III. To identify the factors influencing the perception and attitude of farmers about operation and benefits of e-NAM.

IV. To analyse the trading behaviour of farmers towards e-NAM.

V. To find out the challenges faced by farmers in transacting the produce through e-NAM.

I. Socio Economic Profile of the Farmers using e-NAM:

Socio -economic aspects such as age, annual income and educational qualification provide a base for studying the adoption of e-Nam and behavioural intention of farmers. The socio-economic factors are studied in this section with reference to the farmers.

Table – 4.1

Socio Economic Profile of the Respondents

Description	Category	Frequency	Percentage
1) Age	Below 25	4	3.9
	26 – 35	24	23.3
	36 – 45	38	36.9
	46 – 55	27	26.2
	Above 55	10	9.7
	Total	**103**	**100.0**
2) Annual Income	Below 1,00,000	59	57.3

	1,00,001 to 2,00,000	10	9.9
	2,00,001 to 3,00,000	10	9.5
	3,00,001 to 4,00,000	13	12.6
	4,00,001 to 5,00,000	11	10.7
	Total	**103**	**100.0**
3) Educational Qualification	Upto 5^{th}	11	10.7
	Upto 8^{th}	20	19.5
	Upto 10^{th}	19	18.4
	Upto 12^{th}	20	19.4
	Graduation	33	32.0
	Total	**103**	**100.0**

Source: Primary Data

Age of the Respondents

Age of the respondents reveals that, majority of respondents 36.9 were from the age group of 36-45 years, 26.2 percent of the respondents were from 46-55 years category and 23.3 respondents from 26-35 years category, 3.9 percent of the respondents were from below 25 years category and 9.7 percent of the respondents were from above 55 years category. It is understood from the age of respondents that, majority of the respondents who are involved in farming are from middle age that is between 36-45 years.

Annual Income

The classification based on annual income revealed that majority of the respondents 57.3 percent earn below Rs.1,00,000, 9.9 percent of the respondents earn Rs.1,00,001 to Rs.2,00,000, 9.5 percent of the respondents earn Rs.2,00,001 to Rs.3,00,000, 12.6 percent of the respondents earn Rs.3,00,001 to Rs.4,00,000 and 10.7 percent of the respondents earn Rs.4,00,001 to Rs.5,00,000. The survey reveals that majority of the respondents earn below Rs.1,00,000.

Educational Qualification

Maximum number of respondents 32.0 percent belongs to graduate,10.7 percent were from upto 5^{th}, 19.5 percent were from upto 8^{th}, 18.4 percent were from upto 10^{th} and19.4 percent from upto 12^{th}. It is cleared that graduate have much interest in farming.

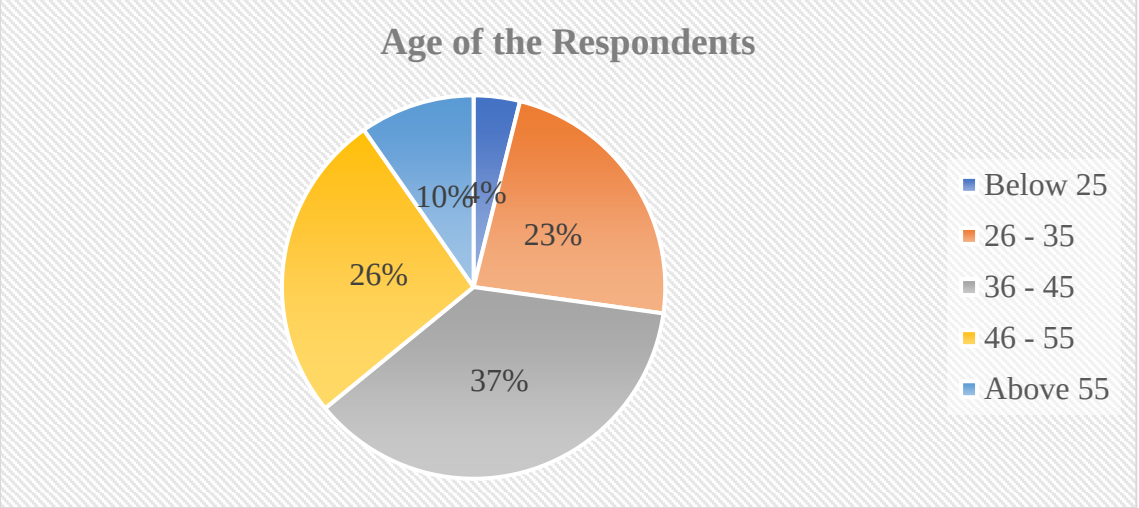


Figure 4.1.1 Age of the Respondents

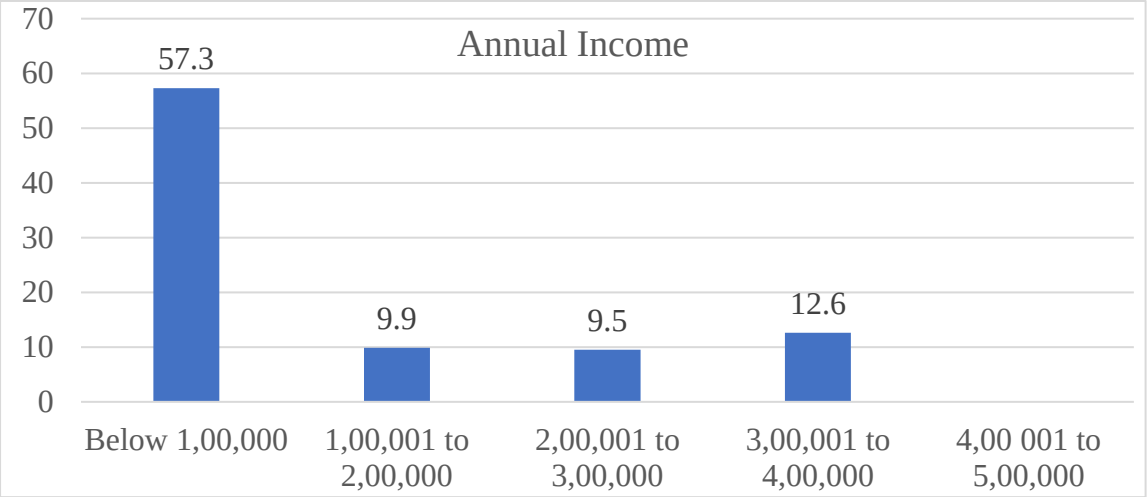


Figure 4.1.2 Annual Income

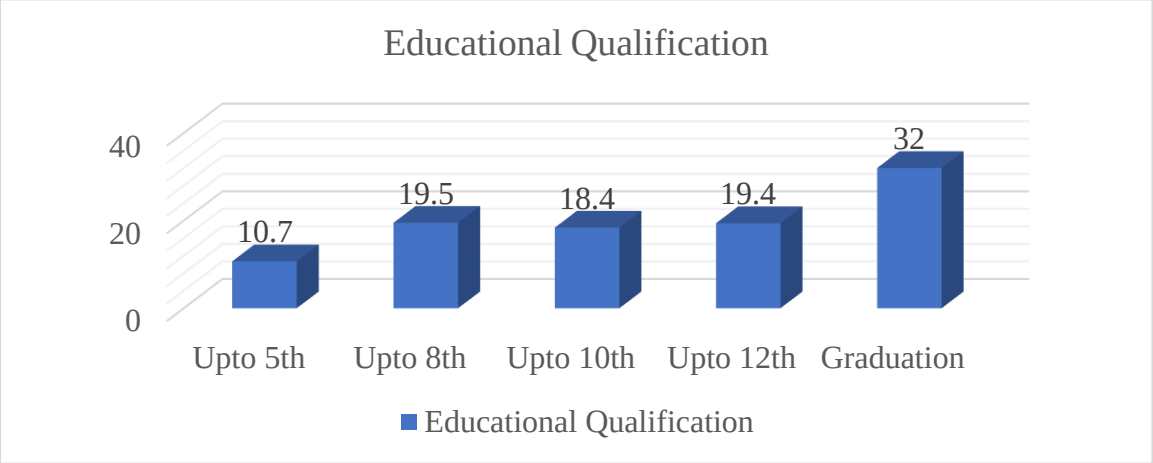


Figure 4.1.3 Educational Qualification

II. To Study the Awareness of e-NAM among the Farmers:

As awareness of any scheme or program is necessary for effective progress and outcome therefore a survey was conducted among farmers to know the status of awareness of e-NAM process.

4.2 Acres owned by the farmers and usage of e-NAM

Table – 4.2

Acres owned by farmers and usage of e-NAM

Description	Category	Frequency	Percentage
1) Acres	1 to 10	66	64.0
	11 to 20	22	21.4
	21 to 30	15	14.6
	Total	**103**	**100.0**
2) Usage of e-Nam	Yes	50	48.5
	No	53	51.5
	Total	**103**	**100.0**

Source: Primary Data

Acres owned by the farmers

Maximum number of respondents 64.0 percent belongs to 1 to 10 acres, 21.4 percent of the respondents from 11 to 20 acres and 14.6 percent from 21 to 30 acres. Hence, the majority of the respondents have 1 to 10 acres.

Usage of e-NAM

From the table 4.3, it is observed that 48.5 percent of the respondents are using e-nam and 51.5 percent of the respondents are not using e-nam. Hence, the majority of the respondents are not using e-nam.

4.3 Classification of the respondents based on age and usage of e-nam

Table – 4.3

Age and Usage of e-nam

Usage of e-nam	Yes	No	Total
Below 25	4	0	4

	(100)	(0)	
26 – 35	16 (64)	9 (36)	25
36 – 45	17 (45.9)	20 (54.1)	37
46 – 55	8 (29.6)	19 (70.4)	27
Above 55	5 (50)	5 (50)	10
Total	**50**	**53**	**103**

Source: Computed Data

The preference of e-NAM over farmers was also surveyed and the findings revealed that 54.1 percent of the respondents were preferring e- NAM over traditional marketing channel. However, 45.9 percent of the respondents are preferring traditional market to e-NAM. Further, with increasing in age of the respondents, the preference towards traditional market is increasing. This implies that age old people want to stick to the traditional market. However, the survey indicated that there is slow and gradual acceptance of respondents towards e-NAM. It is also found that the farmers are still depending upon the commission agents even with the advent of e-NAM system.

4.4 Classification of the respondents based on education and reasons for using e-nam platform:

Table 4.4

Education and Reasons for using e-nam platform

Education		Upto 5^{th}	Upto 8^{th}	Upto 10^{th}	Upto 12^{th}	Graduation	**Total**
Reasons for using e-nam	Farmers get better price	6 (14.3)	2 (4.8)	13 (31.0)	12 (28.6)	9 (21.4)	42 (40.70)
	Absence of middlemen	0 (0)	2 (20.0)	1 (10.0)	1 (10.0)	6 (60.0)	10 (9.7)

	Payment process is online and easy	0 (0)	11 (55.0)	1 (5.0)	1 (5.0)	7 (35.0)	20 (19.4)
	Consumers get fresh produce	0 (0)	5 (83.3)	1 (16.7)	0 (0)	0 (0)	6 (5.8)
	Farmers get better price and Absence of middlemen	4 (80.0)	0 (0)	1 (20.0)	0 (0)	0 (0)	5 (4.8)
	Farmers get better price, Absence of middlemen and Payment process is online and easy	0 (0)	0 (0)	0 (0)	0 (0)	5 (100.0)	5 (4.8)
	Farmers get better price, Absence of middlemen and Payment process is online and easy, Consumers get fresh produce	0 (0)	0 (0)	1 (20.0)	2 (40.0)	2 (40.0)	5 (4.8)
	Farmers get better price and Payment process is online and easy	1 (20.0)	0 (0)	0 (0)	0 (0)	4 (80.0)	5 (4.8)
	Absence of middlemen and Payment process is online and easy	0 (0)	0 (0)	1 (20.0)	4 (80.0)	0 (0)	5 (4.8)
Total		**11 (10.7)**	**20 (19.4)**	**19 (18.4)**	**20 (19.4)**	**33 (32.0)**	**103 (100.0)**

Source: Computed Data

The majority of 40.70 percent of the respondents reasons for using e-nam is farmers get better price, Among these 31.0 percent of the respondents who has studied upto 10^{th}. The next majority of 28.6 percent of the respondents who has educational qualification of 12^{th}. The next majority of 55.0 percent of the respondents who has educational qualification of upto 8^{th}. The majority of 19.4 percent of the respondents use e-nam for payment process is online and easy. It is concluded that the graduate people use electronic trading for transacting their goods which reduce the commission cost and give high profit to farmers.

4.5 Classification of the respondents based on annual income and acres owned by farmers:

Table - 4.5

Annual income and Acres owned by farmers

Acres owned by Farmers		1 to 10 Acres	11 to 20 Acres	21 to 30 Acres	**Total**
Annual Income	Below 1,00,000	34 (57.6)	15 (25.4)	10 (16.9)	59 (57.3)
	1,00,001 to 2,00,000	0 (0)	5 (50.0)	5 (50.0)	10 (9.7)
	2,00,001 to 3,00,000	10 (100.0)	0 (0)	0 (0)	10 (9.7)
	3,00,001 to 4,00,000	11 (84.6)	2 (15.4)	0 (0)	13 (12.6)
	4,00,001 to 5,00,000	11 (100.0)	0 (0)	0 (0)	11 (10.7)
Total		**66 (64.1)**	**22 (21.4)**	**15 (14.6)**	**103 (100.0)**

Source: Primary Data

The majority of 57.6 percentage of the respondents have 1 to 10 acres who earn below Rs.1,00,000. Among these 9.7 percentage of the respondents earn Rs. 1,00,001 to 2,00,000. The next majority of 12.6 respondents earn Rs.3,00,001 to 4,00,000 who have 1 to 10 acres. The next majority of 10.7 respondents earn Rs.4,00,001 to 5,00,000. The majority of farmers have 1 to 10 acres. It is concluded that farmers have low number of acres cultivate the crops who earn less income.

4.6 Awareness created for e-NAM transactions:

Table – 4.6

Awareness created for e-NAM transactions

Description	Category	Frequency	Percentage
1)Awareness created for e-NAM transactions	Public announcement system	22	21.4
	IVRS platform can be developed to spread more information	20	19.4
	Training and group discussions in the villages	5	4.9
	Awareness created by agriculture, horticulture and other allied departments to farmers	36	35.0
	Public announcement system, Training and group discussions in the villages and Awareness created by agriculture, horticulture and other allied departments to farmers	5	4.9
	Public announcement system, Awareness created by agriculture, horticulture and other allied departments to farmers	15	14.6

	Total	**103**	**100.0**

Sources: Primary Data

From the table 4.6, it is clear that majority of the respondents 35.0 percent awareness are created by agriculture, horticulture and other allied departments to farmers, 21.4 percent of the respondents get through public announcement system, 14.6 percent of the respondents created by both public announcement system, awareness created by agriculture, horticulture and other allied departments to farmers, 19.4 percent of the respondents get through IVRS platform can be developed to spread more information and 4.9 percent of the respondents get through training and group discussions in the villages. It shows that there is an urgent need to strengthen the capacity building programs specially trainings and exposure visits for better understanding of farmers with respect to e-NAM process.

4.7 Reasons for using e-NAM platform:

Table - 4.7

Reasons for using e-NAM platform

Description	Category	Frequency	Percentage
1) Reasons for using e-Nam platform	Farmers get better price	42	40.8
	Absence of middlemen	10	9.7
	Payment process is online and easy	20	19.4
	Consumers get fresh produce	6	5.8
	Farmers get better price and Absence of middlemen	5	4.9
	Farmers get better price, Absence of middlemen	5	4.9

	and Payment process is online and easy		
	Farmers get better price, Absence of middlemen, Payment process is online and easy, Consumers get fresh produce	5	4.9
	Farmers get better price; Payment process is online and easy	5	4.9
	Absence of middlemen and Payment process is online and easy	5	4.9
	Total	**103**	**100.0**

Sources: Primary Data

From the table 4.7, shows that 40.8 percent of the respondents get better price, 9.7 percent of the respondents have absence of middlemen, 19.4 percent of the respondents feel payment process through online and easy, 5.8 percent of the respondents get fresh produce and 4.9 percent of the respondents use e-nam because they get better price and also they get benefited due to absence of middlemen, 4.9 percent of the respondents get better price and both absence of middlemen and payment process is online and easy, 4.9 percent of the respondents get all platforms and 4.9 percent of the respondents get two platforms. Hence, the majority of the respondents get better price.

III. To identify the factors influencing the perception and attitude of farmers about operation and benefits of e-NAM:

The major objective of e-NAM process is to help farmers to get better price realization for their quality produce and to measure the major problems faced by farmers on adoption of e-nam.

Table – 4.8

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.828
Bartlett's Test of Sphericity	Approx. Chi-Square	880.625
	Degree of freedom	132
	Significance	0.000

Source: Computed Data

KMO measure of sampling adequacy value is 0.828 which means that all the variables are positively correlated. Bartlett's test of sphericity significance value is less than 0.05 and hence, it is concluded that factor analysis can be performed for these variables.

4.9 Factors influencing the perception and attitude of farmers:

Table – 4.9

Factors influencing the perception and attitude of farmers

Variables	Component		
	1	2	3
Utilizing e-NAM enables me to have more exact data about price and quality	0.764	0.030	0.163
Utilizing e-NAM enables me to sell agrarian products more rapidly	0.831	-0.110	0.233
e-NAM is the best way to sell and market agrarian products in India	0.640	0.459	-0.258
Utilizing e-NAM for selling agricultural produce is a good idea	0.350	0.822	0.147
It is worth to sell agro produce through e-NAM	-0.069	0.942	0.167
I am positive towards e-NAM	0.049	0.250	0.789

I believe that using e-NAM will improve my trade	0.102	0.346	0.846
I strongly recommend others to use e-NAM	0.311	0.258	0.684
I intend to keep track on government announcements concerning e-NAM on a regular basis	0.163	0.030	0. .764
Total variance	3.006	1.809	1.674
Percentage of variance	33.396	20.105	18.596
Cumulative percentage	33.396	53.501	72.097
Extracted Factors	**Effectiveness**	**Attitude**	**Trading Behaviour**

Source: Computed Data

From the table 4.9, the three statements namely effectiveness, attitude and trading behaviour was grouped and contributed 33.396 percent in total variance and named as effectiveness.

The second factor is worth to sell agro produce through e-Nam which contributes 53.501 percent in the total variance. The third factor is used to improve the trade, recommend others to use e-Nam and keep track on government announcement are named as trading behaviour, these statements totally contributed 72.097 percent of total variance.From the factor is clear that the respondents are satisfied with the price and quality.

4.10 Benefits of using e-Nam for farmers:

Table - 4.10

Benefits of using e-Nam for farmers

Variables	**No. of Respondents (103)**					**Total Score**	**Mean Score**	**Rank**
	SA (5)	A (4)	N (3)	D (2)	SD (1)			

Time saving	0	10 (40)	26 (78)	52 (104)	15 (15)	103 238	3.70	II
Better price discovery	10 (50)	5 (20)	25 (75)	53 (106)	10 (10)	103 261	3.47	III
Reduced Transaction Cost for Buyers	10 (50)	10 (40)	25 (75)	42 (84)	16 (16)	103 265	3.43	V
Stable Price	5 (25)	5 (20)	37 (111)	51 (102)	5 (5)	103 263	3.45	IV
Efficient supply chain	5 (25)	12 (48)	35 (105)	40 (80)	11 (11)	103 269	3.39	VI
Transparency weighing, biding etc	5 (25)	16 (64)	32 (96)	40 (80)	10 (10)	103 275	3.33	VIII
Better Payment	5 (25)	0	32 (96)	45 (90)	21 (21)	103 232	3.75	I
Quality testing facility	10 (50)	11 (44)	42 (126)	30 (60)	10 (10)	103 290	3.18	XI
Bidding prices are based on quality of produce	11 (55)	15 (60)	20 (60)	47 (94)	10 (10)	103 279	3.29	X
Easy to use	16 (80)	20 (80)	16 (48)	40 (80)	11 (11)	103 299	3.10	XII
Farmer friendly	27 (135)	15 (60)	15 (45)	36 (72)	10 (10)	103 322	2.87	XIII
Assaying facility	5 (25)	21 (84)	37 (111)	30 (60)	10 (10)	103 290	3.18	XI
E- agreement	5 (25)	16 (64)	32 (96)	40 (80)	10 (10)	103 275	3.33	VIII

Electronic gate passes	10 (50)	21 (84)	21 (84)	30 (60)	21 (21)	103 299	3.30	IX
Warehouse integration	5 (25)	16 (48)	32 (96)	35 (70)	15 (15)	103 254	3.38	VII

Source: Computed Data

From the table 4.10, represents the benefits of using e-nam for farmers shows that better payment ranks number one with the score value of 3.75 and the second rank is related to time saving which has less work and save the time with the score value of 3.70, third rank has better price discovery with score value of 3.47 and following with the least rank to use e-nam farmer friendly.

4.11 Major problems faced by farmers on using e-NAM:

Table – 4.11

Major problems faced by farmers on using e-NAM

Variables	**No. of Respondents (103)**					**Total Score**	**Mean Score**	**Rank**
	SA (5)	**A** (4)	**N** (3)	**D** (2)	**SD** (1)			
No Guidance	0	10 (40)	26 (72)	52 (102)	15 (15)	103 229	3.70	II
Delay in payment	0	5 (20)	30 (90)	46 (96)	22 (22)	103 228	3.83	I
Poor net connectivity	0	21 (84)	36 (108)	35 (70)	11 (11)	103 273	3.35	XI
Cleaning facilities are not adequate	10 (50)	10 (40)	21 (63)	41 (82)	21 (21)	103 256	3.51	VIII
Higher mandi fees	2 (10)	21 (84)	18 (54)	52 (104)	10 (10)	103 262	3.46	X
Trade malpractices	5 (25)	10 (40)	31 (93)	42 (84)	15 (15)	103 257	3.50	IX

Market is far away	0	5 (20)	37 (111)	51 (102)	10 (10)	103 243	3.64	IV
Poor infrastructure	0	10 (40)	36 (108)	36 (72)	21 (21)	103 241	3.66	III
Logistics	0	21 (84)	16 (48)	56 (112)	10 (10)	103 254	3.53	VII
Asking immediate cash	0	10 (40)	37 (111)	46 (92)	10 (10)	103 253	3.54	VI
Resistance from traders	0	10 (40)	41 (123)	36 (72)	16 (16)	103 251	3.56	V

Source: Computed Data

From the table 4.8, it is stated that "Delay in payment" ranks First with a mean score of 3.83. It followed by a "No Guidance" ranks Second with a mean score of 3.70. "Poor infrastructure" ranks Third with a mean score of 3.66. "Market is far away" ranks Fourth with a mean score of 3.64. "Resistance from traders" ranks Fifth with a mean score of 3.56. "Asking immediate cash" ranks Sixth with a mean score of 3.54. "Logistics" ranks Seventh with a mean score of 3.53. "Cleaning facilities are not adequate" ranks Eight with a mean score of 3.51. "Trade malpractices" ranks Ninth with a mean score of 3.50. "Higher mandi fees" stands tenth rank with a mean score of 3.46. "Poor net connectivity" ranks Eleventh with a mean score of 3.35.

IV. To analyse the trading behaviour of farmers towards e-NAM:

e-nam provides a virtual platform to farmers and traders for performing commerce and trade activities across India. It is interesting that the farmers prefer to sell their produce to them, as the farmers enjoy certain benefits like, transport facility, storage facilities, cleaning and grading etc.

4.12 Reasons for trading the commodity through e-NAM:

Table - 4.12

Reasons for trading the commodity through e-NAM

Variables	No. of Respondents (103)					Total Score	Mean Score	Rank
	SA (5)	A (4)	N (3)	D (2)	SD (1)			
Easy process	0	5 (20)	25 (75)	51 (102)	22 (22)	103 219	3.87	II
Easy payment realization	0	15 (60)	42 (126)	41 (82)	5 (5)	103 273	3.35	VIII
Trustworthy relations	0	21 (84)	15 (45)	62 (124)	5 (5)	103 258	3.50	V
Assaying	10 (50)	5 (20)	35 (105)	36 (72)	17 (17)	103 264	3.44	VII
Time Saving	0	16 (64)	35 (105)	41 (82)	11 (11)	103 262	3.46	VI
Unawareness	0	0	30 (90)	47 (94)	26 (26)	103 210	3.96	I
Credit benefit	0	0	41 (123)	36 (72)	26 (26)	103 221	3.85	III
Better price	6	0	30 (90)	57 (114)	10 (10)	103 214	3.63	IV

Source: Computed Data

From the table 4.12, it is stated that “Unawareness” ranks First with a mean score of 3.96. It followed by a “Easy process” ranks Second with a mean score of 3.87. “Credit benefit” ran third with a mean score of 3.85. “Better price” ranks Fourth with a mean score of 3.63. “Trustworthy relations” ranks Fifth with a mean score of 3.50. “Time Saving” ranks Sixth with a mean score of 3.46. “Assaying” ranks Seventh with a mean score of 3.44. “Easy payment realization” ranks Eight with a mean score of 3.64.

4.13 Major commodities traded on e-NAM:

Table – 4.13

Major commodities traded on e-NAM

Description	Category	Frequency	Percentage
1) Commodities traded on e-Nam	Wheat	20	19.4
	Paddy	5	4.9
	Sesame	10	9.7
	Wheat and Paddy	10	9.7
	Wheat, Paddy, Sesame, Turmeric, Sugar and Cotton	11	10.7
	Wheat, Paddy and Turmeric	5	4.9
	Wheat, Sugar and Cotton	5	4.9
	Paddy, Sesame and Turmeric	11	10.7
	Paddy and Turmeric	5	4.9
	Sesame and Turmeric	6	5.8
	Sesame and Cotton	10	9.7
	Turmeric and Sugar	5	4.9
	Total	**103**	**100.0**

Sources: Primary Data

From the table 4.13, it shows that 19.4 percent of the respondents traded wheat, 10.7 percent of the respondents traded paddy, sesame and turmeric, 9.7 percent of the respondents traded sesame and cotton, 5.8 percent of the respondents traded both sesame and turmeric, 4.9 percent of the respondents traded turmeric and sugar, 9.7 percent of the respondents traded only sesame, 9.7 percent of the respondents traded both wheat and paddy, 10.7 percent of the respondents traded all commodities such as wheat, paddy, sesame, turmeric, sugar and cotton. It is concluded that majority of the respondents traded wheat.

4.14 Comparison between socio economic profile and major commodities traded on e-nam:

Ho: There is no significant difference between socio economic profile and major commodities traded on e-nam.

H1: There is significant difference between socio economic profile and major commodities traded on e-nam.

Table – 4.14

Socio economic profile and major commodities traded on e-nam

Particulars		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
Age	Between Group	2.000	2	1.000	.588	.561
	Within Group	54.400	32	1.700		
	Total	56.400	34			
Education Qualification	Between Group	1.286	2	.643	.719	.495
	Within Group	28.600	32	.894		
	Total	29.886	34			
Annual Income	Between Group	17.300	2	8.650	8.900	.001
	Within Group	31.100	32	.972		
	Total	**48.400**	**34**			

Significant (P values <=0.05); Not significant (P values >=0.05)

Source: Primary Data

From the table 4.14, it shows that hypothesis result is accepted in all cases except age and educational qualification. The P-value of age and educational qualification is greater than 0.05, at the 5% level of significance. The farmers traded commodity is based on the annual income. Therefore hypothesis (H_0) is accepted in age and educational qualification and hypothesis (H_1)

is rejected in annual income. It is concluded that there is significant difference between annual income and major commodities traded on e-nam.

4.15 Comparison between acres owned by farmers and major commodities traded on e-nam:

Ho: There is no significant difference between acres owned by farmers and major commodities traded on e-nam.

H1: There is significant difference between acres owned by farmers and major commodities traded on e-nam.

Table – 4.15

Acres owned by farmers and major commodities traded on e-nam

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Group	3.571	2	1.786	3.810	.033
Within Group	15.000	32	.469		
Total	**18.571**	**34**			

Significant (P values <=0.05); Not significant (P values >=0.05)

Source: Primary Data

From the table 4.15, it shows that hypothesis result is accepted. It is evident that the mean value of acres owned by farmers is 1.786 and P-value is .033 which is <0.05. Therefore hypothesis (H_0) is rejected and hypothesis (H_1) is accepted. It is concluded that there is significant difference between acres owned by farmers and major commodities traded on e-nam.

4.16 Comparison between reasons for using e-nam platform and major commodities traded on e-nam.

Ho: There is no significant difference between reasons for using e-nam platform and major commodities traded on e-nam.

H1: There is significant difference between reasons for using e-nam platform and major commodities traded on e-nam.

Table – 4.16

Reasons for using e-nam and major commodities traded on e-nam.

	Sum of Squares	**Df**	**Mean Square**	**F**	**Sig.**
Between Group	2.500	2	1.250	2.250	.125
Within Group	15.000	32	.556		
Total	**17.500**	**34**			

Significant (P values <=0.05); Not significant (P values >=0.05)

Source: Primary Data

From the table 4.16, it shows that hypothesis result is rejected. It is evident that the mean value for using e-nam platform is 1.250 and P-value is .125 which is >0.05. Therefore hypothesis (H_0) is accepted and hypothesis (H_1) is rejected. It is concluded that there is no significant difference between reasons for using e-nam platform and major commodities traded on e-nam.

4.17 Comparison between facilities provided by traders to farmers and major commodities traded on e-nam.

Ho: There is no significant difference between facilities provided by traders to farmers and major commodities traded on e-nam.

H1: There is significant difference between facilities provided by traders to farmers and major commodities traded on e-nam.

Table - 4.17

Facilities provided by traders to farmers and major commodities traded on e-nam.

	Sum of Squares	**Df**	**Mean square**	**F**	**Sig.**

Between Group	.536	2	.268	2.286	.118
Within Group	3.750	32	.117		
Total	**4.286**	**34**			

Significant (P values <=0.05); Not significant (P values >=0.05)

Source: Primary Data

From the table 4.17, it shows that hypothesis result is rejected. It is evident that the mean value of facilities provided by traders to farmers is .268 and P-value is .118 which is >0.05. Therefore hypothesis (H_0) is accepted and hypothesis (H_1) is rejected. It is concluded that there is no significant difference between facilities provided by traders to farmers and major commodities traded on e-nam.

4.18 Comparison between facilitating conditions and major commodities traded on e-nam.

Ho: There is no significant difference between facilitating conditions and major commodities traded on e-nam.

H1: There is significant difference between facilitating conditions and major commodities traded on e-nam.

Table – 4.18

Facilitating conditions and major commodities traded on e-nam.

Products		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
e-NAM platforms lacks required infrastructure like warehousing, internet connectivity, transportation, insurance etc.	Between Group	30.000	2	15.000	48.000	.561
	Within Group	10.000	32	.312		
	Total	40.000	34			

In the APMC mandi, proper instruction and support desks are not available.	Between Group	17.143	2	8.571	53.000	.025
	Within Group	.000	32	.000		
	Total	17.143	34			
The number of computers available for online farm produce sales is insufficient.	Between Group	14.821	2	7.411	63.238	.001
	Within Group	3.750	32	.117		
	Total	18.571	34			
All facilities like grading, assaying etc are available in e-NAM.	Between Group	30.536	2	15.268	130.286	.516
	Within Group	3.750	32	.117		
	Total	34.286	34			
I have the resources (i.e., smartphone/computer, internet, etc.) necessary to use e-NAM.	Between Group	20.893	2	10.446	53.486	.060
	Within Group	6.250	32	.195		
	Total	27.143	34			

Significant (P values <=0.05); Not significant (P values >=0.05)

Source: Primary Data

From the table 4.18, it shows that hypothesis result is accepted in all cases except infrastructure, facilities and resources. The mean value for proper instruction given by mandis and online sales is insufficient have greater than 0.05, at the 5% level of significance. Therefore hypothesis (H_0) is rejected in facilities like warehousing, grading, assaying and infrastructure like internet connectivity, transportation insurance etc., and hypothesis (H_1) is accepted in the cases of proper instruction are not available and online sales is insufficient in e-nam. It is concluded that there is significant difference between resources used in mandis and major commodities traded on e-nam.

4.19 Facilities provided by traders to farmers:

Table – 4.19

Facilities provided by traders to farmers

Description	Category	Frequency	Percentage
Facilities	Storage Facility	26	25.2
	Transport Facility	67	65.0
	Cleaning and Grading	10	9.7
	Total	**103**	**100.0**

Sources: Primary Data

From the table 4.19, it shows that 65.0 percent of the respondents have transport facility, 25.2 percent of the respondents have storage facility and 9.7 percent of the respondents were from cleaning and grading. It is concluded that majority of the respondents have transport facility.

V. To find out the challenges faced by farmers in transacting the produce through e-NAM.

They considered delay in payment, lack of adequate facilities and staff for grading and assaying, complexities involved in understanding the transaction process through e-NAM, poor access to better technology etc., are the prioritized issues in e- NAM transactions. These are the challenges faced by farmers in transacting the produce through e-NAM.

4.20 Challenges faced by farmers in transacting the produce through e-NAM.

Table – 4.20

Challenges faced by farmers in transacting the produce through e-NAM.

Variables	No. of Respondents					Total Score	Mean Score	Rank
	SA (5)	A (4)	N (3)	D (2)	SD (1)			
A) Perceived Ease of Use:	0	5 (20)	15 (45)	62 (124)	21 (21)	103 210	3.96	I

Utilizing e-NAM requires a lot of mental exertion.								
It is hard to utilize e-NAM without expert help.	0	0	30 (90)	61 (122)	11 (11)	103 223	3.82	IV
My interaction with e-NAM is obvious and understandable.	0	0	47 (141)	46 (92)	10 (10)	103 243	3.64	VIII
Selling agrarian products through e-NAM is often frustrating.	0	5 (20)	30 (90)	52 (104)	16 (16)	103 230	3.77	V
It is difficult to learn to become skilful to sell agricultural produce through e-NAM	5 (25)	0	36 (108)	47 (94)	15 (15)	103 242	3.65	VII
B) Facilitating Conditions: e-NAM platforms lack required infrastructure like warehousing, internet connectivity, transportation, insurance etc.	5 (25)	16 (64)	21 (63)	30 (60)	31 (31)	103 243	3.64	VIII
In the APMC mandi, proper instruction and support desks are not available.	0	10 (40)	22 (66)	71 (142)	0	103 248	3.59	IX

The number of computers available for online farm produce sales is insufficient.	0	11 (44)	21 (63)	61 (122)	10 (10)	103 239	3.68	VI
All facilities like grading, assaying etc are available in e-NAM.	6 (30)	5 (20)	16 (48)	40 (80)	36 (36)	103 184	3.92	II
I have the resources (i.e., smartphone/computer, internet, etc.) necessary to use e-NAM.	0	11 (44)	10 (30)	61 (122)	21 (21)	103 217	3.89	III

Source: Computed Data

From the table 4.20, it is stated that "Utilizing e-NAM requires a lot of mental exertion" ranks First with a mean score of 3.96. It followed by a "All facilities like grading, assaying etc are available in e-NAM" ranks Second with a mean score of 3.92. "I have the resources (i.e., smartphone/computer, internet, etc.) necessary to use e-NAM" ranks Third with a mean score of 3.89. "It is hard to utilize e-NAM without expert help" ranks Fourth with a mean score of 3.82. "Selling agrarian products through e-NAM is often frustrating" ranks Fifth with a mean score of 3.77. "The number of computers available for online farm produce sales is insufficient" ranks Sixth with a mean score of 3.68. "It is difficult to learn to become skilful to sell agricultural produce through e-NAM" ranks Seventh with a mean score of 3.65. "e-NAM platforms lack required infrastructure like warehousing, internet connectivity, transportation, insurance etc." ranks Eight with a mean score of 3.64. "In the APMC mandi, proper instruction and support desks are not available" ranks Nineth with a mean score of 3.59.

4.21 Challenges faced by farmers in transacting the produce through e-NAM.

Table – 4.21

Assessment of Measurement Model

Construct	Item	Cronbach's Alpha	Composite Reliability	AVE
Facilitating Conditions	F1	.837	0.958	0.647
	F2			
	F3			
	F4			
	F5			
Perceived Ease of Use	P1	.906	0.789	0.714
	P2			
	P3			
	P4			
	P5			

Table – 4.22

Hetrotrait – Multitrait (HTMT)

Construct	FC 1	FC 2	FC 3	FC 4	FC 5	PEOU 1	PEOU 2	PEOU 3	PEOU 4	PEOU 5
FC 1										
FC 2	0.154									
FC 3	0.287	0.824								
FC 4	0.293	0.736	0.610							
FC 5	0.572	0.586	0.735	0.583						
PEOU 1	0.476	0.038	0.047	0.040	0.045					
PEOU 2	0.152	0.056	0. 067	0.139	0.022	0.160				
PEOU 3	0.230	0.332	0.472	0.096	0.474	0.130	0.317			
PEOU 4	0.231	0.748	0.675	0.325	0.484	0.126	0.029	0.465		
PEOU 5	0.152	0.675	0.484	0.265	0.231	0.206	0.445	0.476	.332	

Source: Computed Data

The assessment of measurement model is to check the internal consistency and validity of the constructs. Internal consistency reliability was checked using Cronbach's alpha. Table 4.21

illustrates that all the constructs are having the value of Cronbach's alpha and CR more than 0.70 indicating that the constructs have internal consistency reliability. Table 4.21 shows that all the constructs in the model have Average Variance Extracted (AVE) value of more than 0.50 which shows the convergent validity. Discriminant validity of the outer model can be checked using Hetrotrait and Multitrait (HTMT) approach, threshold value is 0.83 for conceptually distinct constructs. Table 4.22 shows that all the values are less than 0.83 hence, the measurement model have discriminant validity.

4.23 Various challenges are faced by the farmers in adoption of e-NAM

Table – 4.23

Various challenges are faced by the farmers in adoption of e-NAM

Variables	No. of Respondents					Total Score	Mean Score	Rank
	SA (5)	A (4)	N (3)	D (2)	SD (1)			
Inadequate infrastructure	32 (160)	40 (160)	26 (78)	5 (10)	0	408	3.96	I
Grading and assaying	5 (25)	67 (268)	25 (75)	6 (12)	0	380	3.69	V
Complexities involved in the process	5 (25)	41 (164)	36 (108)	21 (42)	0	339	3.29	VI
Not well versed in technology	16 (80)	51 (204)	25 (75)	11 (11)	0	370	3.70	IV
Delay in dispute settlement	20 (100)	51 (204)	22 (66)	5 (10)	5 (5)	385	3.74	III
Limited number of commodities covered	17 (85)	48 (192)	28 (84)	5 (10)	5 (5)	376	3.65	V

under e-NAM								
Difficulty while handling mobile application	6 (30)	71 (284)	26 (78)	0	0	392	3.81	II

Source: Computed Data

From the table 4.23, it is stated that inadequate infrastructure ranks first with a mean score of 3.96. It followed by a difficulty while handling mobile application ranks second with a mean score of 3.81. Delay in dispute settlement ranks third with a mean score of 3.74. not well versed in technology ranks fourth with a mean score of 3.82. Grading and assaying ranks fifth with a mean score of 3.65. Complexities involved in the process ranks sixth with a mean score of 3.29.

4.24 Difficulties in the operation of e-NAM:

Table – 4.24

Difficulties in the operation of e-NAM

Variables	**No. of Respondents**					**Total Score**	**Mean Score**	**Rank**
	SA (5)	**A (4)**	**N (3)**	**D (2)**	**SD (1)**			
Lack of awareness	22 (110)	56 (224)	20 (60)	5 (10)	0	404	3.92	I
Difficulty in cash payment	10 (50)	72 (288)	16 (48)	5 (10)	0	396	3.84	II
Internet connectivity issue	6 (30)	50 (200)	37 (111)	10 (20)	0	361	3.50	V
Procedure is time consuming	11 (55)	57 (228)	25 (75)	10 (20)	0	378	3.67	III

Lack of proper operational knowledge	5 (25)	56 (224)	32 (96)	10 (20)	0	365	3.54	IV
Security issue in interstate trading	6 (30)	55 (220)	32 (96)	5 (10)	5 (5)	361	3.50	V
Farmers are not ready to trade on e-NAM	5 (25)	51 (204)	36 (108)	11 (22)	0	359	3.49	VI

Source: Computed Data

From the table 4.24, it is stated that lack of awareness ranks first with a mean score of 3.92. It followed by a difficulty in cash payment ranks second with a mean score of 3.84. Procedure is time consuming ranks third with a mean score of 3.67. Lack of proper operational knowledge ranks fourth with a mean score of 3.54. Internet connectivity issue also ranks fifth with a mean score of 3.50. Security issue in interstate trading ranks fifth with a mean score of 3.50. Farmers are not ready to trade on e-NAM ranks sixth with a mean score of 3.49.

FINDINGS, SUGGESTIONS AND CONCLUSIONS

CHAPTER V

FINDINGS, SUGGESTIONS AND CONCLUSIONS

FINDINGS OF THE STUDY

The major findings of the study has been categorized in five ways, they are

5.1 Socio Economic Profile of the farmers using e-NAM.

5.2 To study the awareness of e-NAM among the farmers.

5.3 To identify the factors influencing the perception and attitude of farmers about operation and benefits of e-NAM.

5.4 To analyse the trading behaviour of farmers towards e-NAM.

5.5 To find out the challenges faced by farmers in transacting the produce through e-NAM.

5.1 Socio-Economic profile of farmers using e-NAM:

- The majority of the respondents belongs to the age group of 36 – 45 years.
- The survey reveals that most of the respondent's family annual income is below Rs. 1,00,000.
- The majority of the respondents are at the educational level of graduate.

5.2 To study the awareness of e-NAM among the farmers:

- The study reveals that most of the farmers have 1 to 10 acres.
- The study clearly shows that majority of the farmers are not using e-NAM.
- It is also found that the farmers are still depending upon the commission agents even with the advent of e-NAM system.
- It is concluded that the graduate people use electronic trading for transacting their goods which reduce the commission cost and give high profit to farmers.
- It is concluded that farmers have low number of acres cultivate the crops who earn less income.
- It is clear that majority of the respondents created awareness by agriculture, horticulture and other allied departments to farmers.
- The majority of the respondents of farmers gets better price.

5.3 To identify the factors influencing the perception and attitude of farmers about operation and benefits of e-NAM:

- The factor is used to improve the trade, recommend others to use e-Nam and keep track on government announcement of 72.097 percent are satisfied with trading behavior.
- The study represents the benefits of using e-nam for farmers shows that better payment ranks number one with the score value of 3.75.
- It is stated that Delay in payment ranks first with a mean score of 3.83.

5.4 To analyse the trading behaviour of farmers towards e-NAM:

- It is stated that "Unawareness" ranks first with a mean score of 3.96.
- The study shows that 19.4 percent of the respondents of farmers traded wheat.
- It is concluded that there is significant difference between annual income and major commodities traded on e-nam.
- It is concluded that there is significant difference between acres owned by farmers and major commodities traded on e-nam.
- It is concluded that there is no significant difference between reasons for using e-nam platform and major commodities traded on e-nam.
- It is concluded that there is no significant difference between facilities provided by traders to farmers and major commodities traded on e-nam.
- It is concluded that there is significant difference between resources used in mandis and major commodities traded on e-nam.
- The study reveals that majority 65.0 percent of the respondents have transport facility.

5.5 To find out the challenges faced by farmers in transacting the produce through e-NAM:

- It is stated that challenges faced by farmers in transacting the produce through e-NAM were "Utilizing e-NAM requires a lot of mental exertion" ranks first with a mean score of 3.96.
- It is stated that all the values are less than 0.83. Hence the measurement model have discriminant validity.
- It is stated that adoption of e-NAM has Inadequate infrastructure ranks first with a mean score of 3.96.
- It is stated that operation of e-NAM has Lack of awareness ranks first with a mean score of 3.92.

SUGGESTIONS:

- There is need to improve the software support provided to mandi for smooth functioning of e-NAM. It was observed that some of mandies do not have the facilities of electronic gate-pass, electronic display board, integration of weighment with e-NAM portal and facility of exit gate-pass. Hence, the above facilities should be strengthened to all over mandis in India.
- It is suggested that state government should implement the e-NAM all the market in the state, so that the competition will increase, and the farmers will get ultimate benefits on it.
- Since most of the sellers use to bid their produce at the last minutes only; the initial bidding price should start with 5% higher price over the previous successful bid. It is also suggested to increase the bidding time to at least 30 minutes.
- Despite of having smart phones in the hands of respondents, limited number of farmers are accessing e-NAM platform through mobile apps. Hence, it is suggested a soft skill training is very much required to the farmers to make use of e-NAM app from mobile phones.
- Most of the respondents are facing significant challenges while dealing with e- NAM platform like payment related issues, grading and assaying issue and complexity in the process of using e-NAM. The challenges are mostly related to technology (digital technology), acceptance of parameters assayed by assaying machines or complexity of e-NAM process (acceptance of digital platform) etc. Hence, more number of skill and soft skill capacity based programs should be organized among the farmers to address these practical issues.
- The Government has to make sincere efforts to create awareness among farmers to increase the preference of choice of e-NAM. This process will also be helpful in reducing the dependency on intermediaries and increase the choice of farmers towards e-NAM.

CONCLUSIONS:

The purpose of this study was to identify the factors influencing the trading behavior of farmers towards e-nam. The use of e-nam in the marketing of agricultural produce can pave the way for the development of this sector and provide better prices, time saving, bidding and increase the volume of trade. Transport facilities are provided by traders to farmers. Wheat are the major commodity traded on e-nam. Awareness are created by agriculture, horticulture and other allied departments to farmers. It has been found that as perceived by the majority of farmers price discovery is improving through online trading.

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ANNEXURE

ANNEXURE

1. Age

a) Below 25 years b) 26 – 35 c) 36 – 45

d) 46 – 55 e) Above 55

2. Educational Qualification

a) Upto 5^{th} b) Upto 8^{th} c) Upto 10^{th}

d) Upto 12^{th} e) Graduate

3. Annual Income

a) Below 1,00,000 b) 1,00,001 to 2,00,000 c) 2,00,001 to 3,00,000

d) 3,00,001 to 4,00,000 e) 4,00,001 to 5,00,000

4. Have you ever used e-NAM.

a) Yes

b) No

5. How many acres do you have.

a) 1 to 10 Acres

b) 11 to 20 Acres

c) 21 to 30 Acres

6. Reasons for using e-NAM platform.

a) Farmers get better price

b) Absence of middlemen

c) Payment process is online and easy

d) Consumers get fresh produce

7. Please select the below items that the awareness created for e-NAM transactions.

a) Public announcement system

b) IVRS platform can be developed to spread more information

c) Training and group discussions in the villages

d) Awareness created by agriculture, horticulture and other allied departments to farmers

8. To analyse the perception and attitude of farmers about operation and benefits of e-NAM.

Please indicate the level of agreement with the statement below.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
A. Effectiveness: Utilizing e-NAM enables me to have more exact data about price and quality.					
Utilizing e-NAM enables me to sell agrarian products more rapidly.					
e-NAM is the best way to sell and market agrarian products in India.					
B. Attitude: Utilizing e-NAM for selling agricultural produce is a good idea.					
It is worth to sell agro produce through e-NAM.					
I am positive towards e-NAM.					
C. Trading Behaviour:					

I believe that using e-NAM will improve my trade.					
I strongly recommend others to use e-NAM.					
I intend to keep track on government announcements concerning e-NAM on a regular basis.					

9. Benefits of using e-NAM for farmers.

Please indicate the level of agreement with the statement below.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
Time saving					
Better price discovery					
Reduced Transaction Cost for Buyers					
Stable Price					
Efficient supply chain					
Transparency weighing, biding etc					
Better Payment					
Quality testing facility					

Bidding prices are based on quality of produce					
Easy to use					
Farmer friendly					
Assaying facility					
E- agreement					
Electronic gate passes					
Warehouse integration					

10. Major problems faced by farmers on using e-NAM.

Please indicate the level of agreement with the statement below.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
No Guidance					
Delay in payment					
Poor net connectivity					
Cleaning facilities are not adequate					
Higher mandi fees					
Trade malpractices					

Market is far away					
Poor infrastructure					
Logistics					
Asking immediate cash					
Resistance from traders					

11. Reasons for trading the commodity through e-NAM.

Please indicate the level of agreement with the statement below.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
Easy process					
Easy payment realization					
Trustworthy relations					
Assaying					
Time Saving					
Unawareness					
Credit benefit					
Better price					

12. What are the major commodities traded on e-NAM.

a) Wheat

b) Paddy

c) Sesame

d) Turmeric

e) Sugar

f) Cotton

13. What facilities are provided by traders to farmers.

a) Storage facility

b) Transport facility

c) Cleaning and grading

14. To find out the challenges faced by farmers in transacting the produce through e-NAM.

Please indicate the level of agreement with the statement below.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
A. Perceived Ease of Use: Utilizing e-NAM requires a lot of mental exertion.					
It is hard to utilize e-NAM without expert help.					
My interaction with e-NAM is obvious and understandable.					
Selling agrarian products through e-NAM is often frustrating.					
It is difficult to learn to become skillful to sell agricultural produce through e-NAM.					
B. Facilitating Conditions: e-NAM platforms lacks required infrastructure like warehousing, internet connectivity, transportation, insurance etc.					

In the APMC mandi, proper instruction and support desks are not available.					
The number of computers available for online farm produce sales is insufficient.					
All facilities like grading, assaying etc are available in e-NAM.					
I have the resources (i.e., smartphone/computer, internet, etc.) necessary to use e-NAM.					

15. Please indicate the level of agreement through the various challenges are faced by the farmers in adoption of e-NAM.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
Inadequate infrastructure					
Grading and assaying					
Complexities involved in the process					
Not well versed in technology					
Delay in dispute settlement					
Limited number of commodities covered under e-NAM					
Difficulty while handling mobile application					

16. what are the difficulties in the operation of e-NAM.

Please select the level of agreement with the statement below.

Particulars	**Strongly Agree**	**Agree**	**Neutral**	**Dis Agree**	**Strongly Disagree**
Lack of awareness					
Difficulty in cash payment					
Internet connectivity issue					
Procedure is time consuming					
Lack of proper operational knowledge					
Security issue in interstate trading					
Farmers are not ready to trade on e-NAM					