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Mukesh Kumar
Department of Business
Management, CCS Haryana
Agricultural University, Hisar,
Haryana, India

Atul Dhingra
Department of Business
Management, CCS Haryana
Agricultural University, Hisar,
Haryana, India

Suman Ghalawat
Department of Business
Management, CCS Haryana
Agricultural University, Hisar,
Haryana, India

Dalip Bishnoi
Department of Agricultural
Economics, CCS Haryana
Agricultural University, Hisar,
Haryana, India

Nitin Bhardwaj
Department of Mathematics and
Statistics, CCS Haryana
Agricultural University, Hisar,
Haryana, India

KK Yadav
Directorate of Extension
Education, CCS Haryana
Agricultural University, Hisar,
Haryana, India

Problems and intricacies in operating through e-NAM: The perception of farmers of Haryana

Mukesh Kumar, Atul Dhingra, Suman Ghalawat, Dalip Bishnoi, Nitin Bhardwaj and KK Yadav

Abstract
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. e-NAM was launched with the theme of 'one nation, one market'. As per the Government of India data, as on June, 2020, 1000 Mandis across 18 States and 3 Union Territories are reported under e-NAM, out of which 81 are in the Haryana. A total of 193 commodities including food grains, oilseeds, fruits & vegetables, spices etc. are listed in the e-NAM market. There are many stakeholders of e-NAM which include farmers, intermediaries, government officials etc. These stakeholders must operate with ease in e-NAM, in order to reap all the benefits.
An attempt has been made in this research paper to analyse perception of farmers of Haryana on the problems and intricacies faced in operating through e-NAM. The study covered 100 farmers of Haryana who were selected using judgement sampling. Results revealed that 54% of farmer faced problem while selling on e-NAM whereas 46% do not face problem while selling on e-NAM. Educational level of the farmers had a significant impact on problems faced while operating through e-NAM. However, age of the farmers had a non-significant impact on problems faced while trading through e-NAM. According to farmers, the most challenging factors in using e-NAM included lack of training programmes and poor understanding of the concept, limited numbers of commodities covered under e-NAM and delay in dispute settlement. The study concluded that the identification of the problems in operating through e-NAM and resolving them timely is required in bearing full fruits of e-NAM.

Keywords: e-NAM, Agri-business, farmers, mandi, selling, trading, commodities, agriculture

Introduction
Agriculture and related sectors continue to be critical to Indian economy's long-term growth and development. They also serve the food and nutritional needs of 1.39 billion Indians (Indiastat.com), through various backward and forward linkages. Agriculture makes a considerable contribution to output, employment, and demand creation. Furthermore, the agricultural sector's importance in reducing poverty and guaranteeing the economy's long-term development is well documented. Agriculture and related sectors employ more than half of the Indian population (Census, 2011), and they account for 16.5% of the country's total value added (GVA).

In the Agricultural sector, activities can be split into three categories: pre-cultivation, cultivation and post-production, as well as input and output marketing. The private sector is primarily responsible for input marketing, whereas the producers, namely farmers, are responsible for output marketing. More than 85 percent of India's 14.6 crore farmers are smallholders, meaning they have operating land of less than 2 hectares. In some states, like Bihar, West Bengal, and Kerala, the proportion of marginal farmers (those with a 1.0 hectare holding) exceeds 80% (Kumar et al. (2020) [4]. Due to a lack of market access, farmers in India sell their produce through brokers and commission agents mainly in distress. Small and marginal farmers with small marketable lots find it difficult to sell their produce in the APMC-regulated market, because of the APMC mandi's remote location, transportation cost is a major part of the marketing cost.

Agricultural produce marketing is regulated by regional Agricultural Produce Marketing (Regulation) Acts in India's several states and union territories. A huge network of regulated markets has been built under this framework. The APMC Act's main goal is to ensure that effective price discovery is achieved through the interaction of supply and demand forces. Some of the major problems with the current marketing system are the insufficient number of

Corresponding Author:
Mukesh Kumar
Department of Business
Management, CCS Haryana
Agricultural University, Hisar,
Haryana, India

APMC markets and their inadequate Infrastructure facility, limited access to market for (small) farmers, less remuneration to the farmers and high intermediation cost, lack of market information / Information asymmetry, need to physically bring the produce to *mandi*, high incidence of market fee/ charges, fragmentation of markets, requirement of multiple licenses for trading, multiple point levy of market fee, existence of opaque/ semi-transparent processes of bidding and lack of emergence of alternative channels of marketing (Nuthalapati *et al.* (2020) [5].

Since India's independence, agricultural marketing has come a long way. A recent initiative in this area is the idea of a unified common market platform, which was launched on April 14, 2016, as a Pan-India electronic trading portal known as National Agriculture Market (e-NAM). It is a virtual market platform that links the existing physical Mandis, i.e., APMCs, electronically with the theme of "one nation, one market" as e-NAM market. Farmers, merchants, and purchasers can trade commodities online through this platform. This e-trading platform allows for agricultural commodity trading, purchasing, selling, payments and delivery. e-NAM supports standardisation and simplifying of procedures across integrated markets, eliminates the information gap between buyers and sellers and encourages real-time price discovery based on market demand and supply. It provides transparency in the auction process and access to a nation-wide market to both the parties. NAM is led by the Small Farmer's Agribusiness Consortium (SFAC), which is a registered organisation within the Ministry of Agriculture and Farmer Welfare's Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW). SFAC selects a Strategic Partner (SP) to design, run, and maintain the NAM e-platform through an open tender process. A Central Sector Scheme for Promotion of National Agricultural Market through Agri-Tech Infrastructure Fund was authorised by the Cabinet Committee on Economic Affairs (ATIF). The ATIF has been given a budget of Rs. 200 crores by the government. SFAC will use this money to execute NAM for three years, from 2015-16 to 2017-18.

The vision is to promote uniformity in agriculture marketing by streamlining of procedures across the integrated markets, removing information asymmetry between buyers and sellers and promoting real time price discovery based on actual demand and supply. The mission is integration of APMCs across the country through a common online market platform to facilitate pan-India trade in agriculture commodities, providing better price discovery through transparent auction process based on quality of produce along with timely online payment.

Materials and Methods
The study has been conducted in 20 e-NAM Mandis of 13 districts of Haryana. This state was used for study because out of 113 APMC mandies 81 mandies are operated through e-NAM. In some
mandies of Haryana e-NAM were used from first phase of launching in year 2016. The study covered 100 farmers of Haryana who were selected using judgement sampling. A well-structured questionnaire has been used to gather information from stakeholders. This questionnaire consisted of close ended as well as open ended questions. Personal contact method was used to get the questionnaire filled up by the respondent farmers. Appropriate statistical tools and

techniques have been used to analyse the data. Data were collected during 2021-22. A few hypotheses have been developed and tested using chi-square test.

Results and Discussion
The data regarding problem faced while selling on e-NAM has been shown in table 1 and figure 1 below which indicate that 54(54%) of farmer faced problems while selling on e-NAM whereas 46(46%) did not face any problem while selling on e-NAM. Opinions of farmers on problems faced while selling on e-NAM were divided.

Table 1: Problem Faced while selling on e-NAM

Problem faced while selling	Number of Farmers
No	46
Yes	54

Source: Primary data (2021-2022)
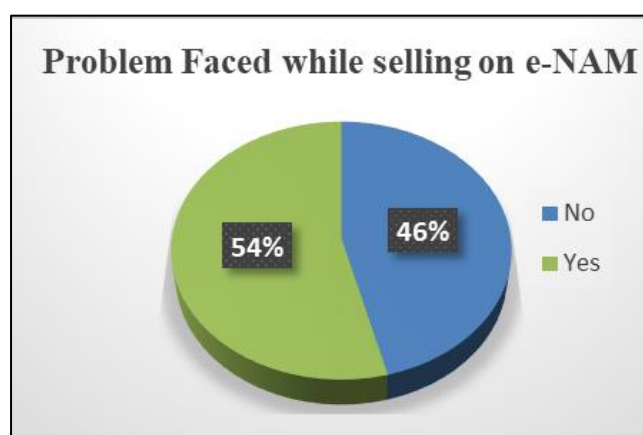
Fig 1: Problem Faced while selling on e-NAM

The impact of age and education level was also determined by developing appropriate hypotheses
and testing them using chi-square test.

H_{01}: Age of farmers has no significant impact on problem faced by farmers while selling on e-NAM.
The results are presented in the table 2 below:

Table 2: Relation between age of farmers and problem faced by farmers while selling on e-NAM
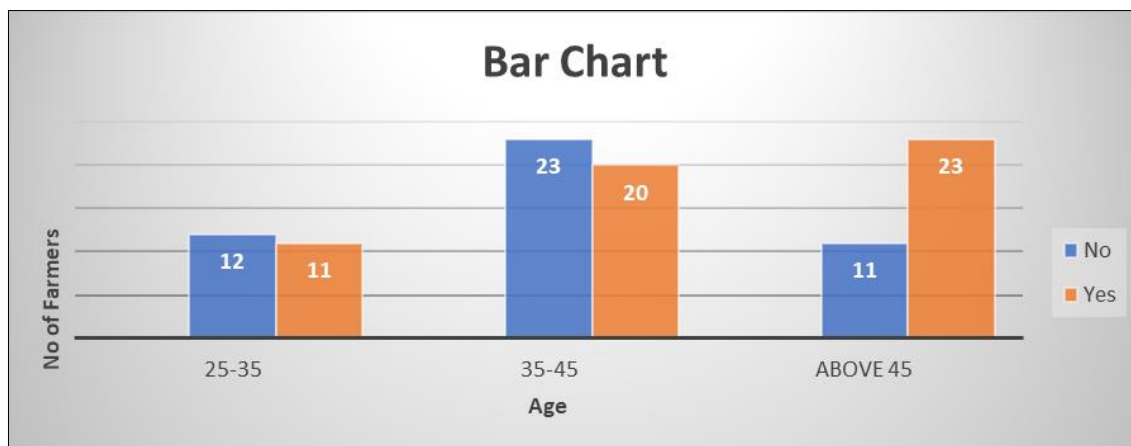
Relation between age of farmers and problem faced by farmers				
S. No.	Age (Yrs.)	No	Yes	Total
1	25-35	12	11	23
2	35-45	23	20	43
3	Above 45	11	23	34
	Total	46	54	100
Pearson Chi-Square Value	3.873			
d.f	2			
Significance	*0.144			

The hypothesis developed above has been tested using Pearson Chi-Square test.
The calculated Chi-Square value comes at 3.873 whereas tabulated value 5.99 at 2 degrees of freedom. Thus, calculated value (3.873) is smaller than tabulated value (5.99) at p-value. 144 >0.05, clearly indicates that null hypothesis has been accepted. Hence there is no significant impact of age of

farmers on problem faced by farmers while selling on e-NAM.

The results clearly depict that age of farmers do not affect the problem faced by farmers during trade through e-NAM. More aged farmer also trades easily on e-NAM.

Fig 2: Relation between age of farmers and problem faced by farmers.

**H$_{02}$:** Education level of farmers has no significant impact on problem faced by farmers' while selling on e-NAM.

The results are presented in the table below:

Table 3: Relation between Education level and problem faced by farmers while selling on e-NAM.

S. No.	Education	No	Yes	Total
Relation between Education level of farmers and problem faced by farmers			
1	Uneducated	1	8	9
2	Primary Education	6	15	21
3	Secondary Education	11	16	27
4	Sec. Secondary Education	15	8	23
5	Graduate	12	7	19
6	Post Graduate	1	0	1
	Total	46	54	100
Pearson Chi-Square Value	14.124			
d.f	5			
Significance	*0.015			

The hypothesis developed above has been tested using Pearson Chi-Square test.

The calculated Chi-Square value came at 14.124 whereas tabulated value is 11.07 at 5 degrees of freedom. Thus, calculated value (14.124) is greater than tabulated value (11.07) at p value 0.015 < 0.05, clearly indicates that null hypothesis has been rejected. Hence, there is a significant impact of education level of farmers on the problems faced by farmers while selling through e-NAM.

The results indicates that as the education level of farmers increases, problems faced by farmers while selling on e-NAM decreases.
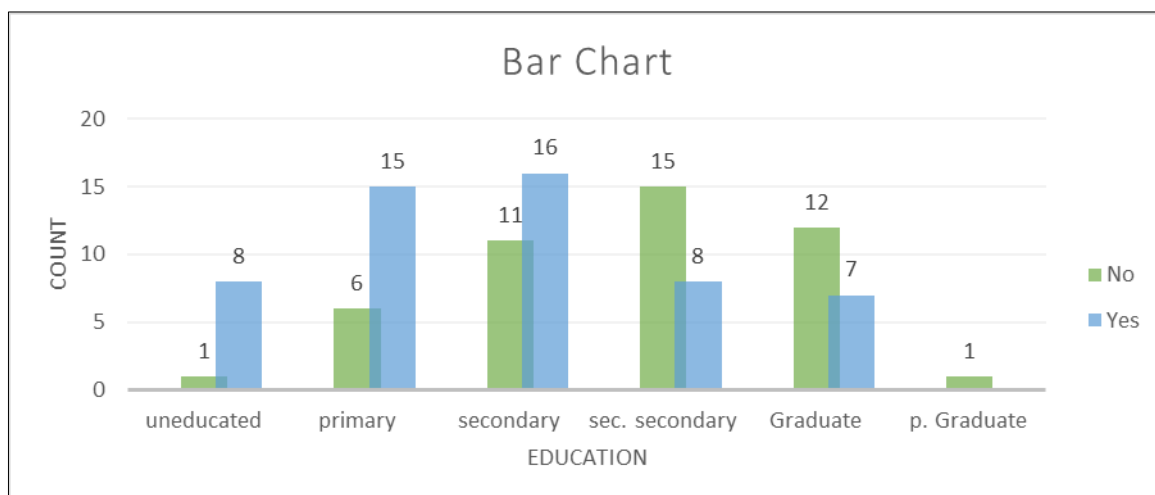
Fig 3: Relation between Education level of farmers and problem faced by farmers

The data regarding response of farmers on challenges faced in e-NAM has been illustrated in table 4 and figure 4 which reveals that majority of farmers consider "Training programs" to be the most challenging factor, as it received the highest scaled score of 163. The second most challenging factor was "poor understanding of concept" with a rank score of 143, followed by "Timely Payment" with a rank score of 103. The remaining factors, namely "Grading and assaying parameters", "Behaviour of mandi officials", "Ease of handling mobile for e-NAM", "Language", and "Not well-versed in technology" were ranked 4th, 5th, 6th, 7th, and 8th, respectively, with rank scores of 94, 65, 54, 38, and 29. Surprisingly, the least challenging factor among these was "Limited numbers of commodities covered under e-NAM", with a rank score of -87, followed by "Delay in dispute settlement" with a rank score of -51. These findings provide insight into the challenges faced by farmers while operating on e-NAM and highlight the need for addressing issues such as training programs, poor understanding of concepts, timely payment and grading and assaying parameters to improve the system's effectiveness.

Table 4: Opinion of farmers on challenges faced in e-NAM

S. No.	Items	N.C.	M.C.	N.	C.	M.C.	Scaled Score	Final Rank
1	Grading and assaying Parameters	1	12	15	36	36	94	4
2	Payment	0	9	0	70	21	103	3
3	Delay in dispute Settlement	15	49	11	22	3	-51	9
4	Poor understanding of Concept	3	5	0	30	62	143	2
5	Not well versed in Technology	3	30	10	49	8	29	8
6	Limited numbers of commodities covered under e-NAM	28	48	8	15	1	-87	10
7	Ease of handling mobile For e-NAM	1	21	14	51	13	54	6
8	Language	4	17	18	59	2	38	7
9	Behaviour of mandi Officials	2	18	10	53	17	65	5
10	Training program	0	2	6	19	73	163	1

N.C.: - Not a Concern M.C.: - Moderately Concern N: - Neutral C: - Concern MC: - Major Concern
Source: Primary data (2021-2022)
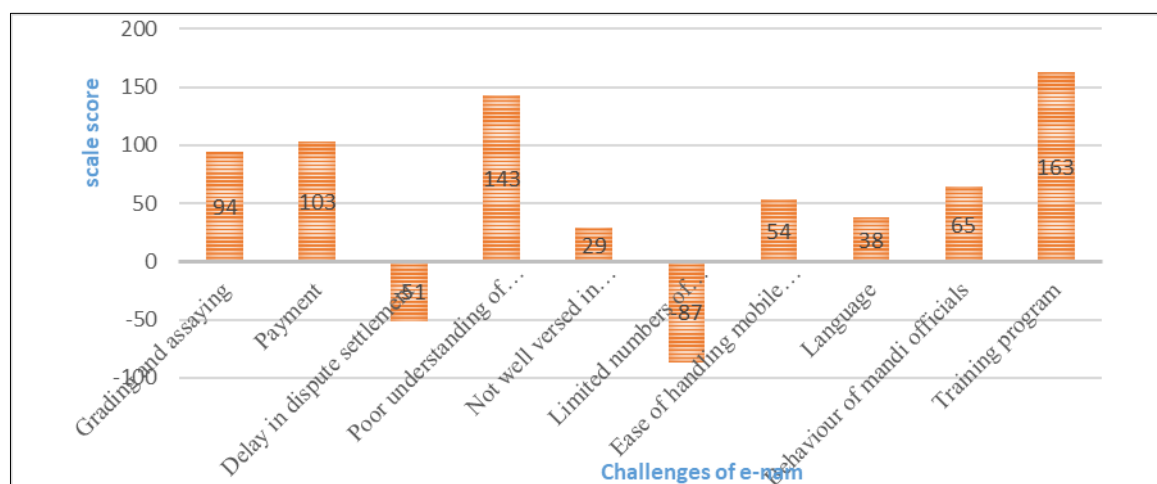
Fig 4: Opinions of farmers on challenges faced in e-NAM

Conclusions
The study revealed that 54 percent farmers face problems while trading through e-NAM while 46 percent farmers do not face problems while trading through e-NAM. The study showed that Age of farmers has no significant impact on problem faced by farmers while selling on e-NAM. So, we can say that age of farmers does not affect the opinion of young and old on the problems faced by them during trade through e-NAM. The study also revealed that Education level of farmers was significantly associated with opinions on problem faced by farmers while trade through e-NAM which shows that as education level of farmers increases, problems faced by farmers during trade through e-NAM decreases.
Training programs, Poor understanding of concepts, Timely payment, and Grading and Assaying parameters were identified as the most challenging by farmers and require immediate attention for the system to function effectively while limited coverage of commodities and delay in dispute settlement were perceived as the least challenging factors.

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