



Transformation in Arrival Trends and Pricing of Agricultural Products through e-NAM: A Case Study of Karnal APMC in Haryana.

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Abstract

The present study was conducted in Karnal APMC of Haryana. The present study assesses the market profile and status of e-NAM in Karnal APMC of Karnal district. The study examines the arrival and prices pattern of major agricultural commodities before and after implementation of e-NAM in the study area. For the present study, primary and secondary both types of data were used. Various tools and techniques analysis such as simple average method, absolute and relative change, standard deviation, co-efficient of variation and compound growth rate was used for data analysis. The study results show that wheat and paddy were major agricultural commodities of Karnal APMC. It clearly observed from the results that the present filled post of staffing pattern and staff strength were less as 49.27 per cent of total sanctioned post in selected APMC. The study examined that after the implementation of e-NAM, the incremental changes were found in the price of wheat and paddy. The results depicted after the implementation of e-NAM, a declined growth rate was found in the total numbers of arrived lots, traded lots, traded value, traded quantity an traded. The study results described that after the implementation of e-NAM in Karnal APMC, the overall change in average arrivals of major commodities was recorded as negative.

Keywords: e-NAM, Agricultural Commodities, Infrastructure facilities, Arrivals and Price pattern

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Introduction

Agricultural marketing plays a crucial role in the agricultural sector, contributing to the overall development and sustainability of agriculture. But the Indian agricultural market has faced various challenges including market fragmentation, price opacity, middleman exploitation, restricted market access, and information asymmetry. In response to face these challenges, the Government of India introduced the Electronic National Agriculture Market (e-NAM) as a comprehensive solution for the agricultural marketing system. The main objective of e-NAM to achieve a unified national market for agricultural commodities by eliminating intermediaries, promoting transparent price discovery, expanding market access, delivering timely market information to farmers, and enhancing overall efficiency in agricultural trade. (www.enam.gov.in). The government of India approved the Electronic National Agriculture Market on 1st July, 2015 which creates a single-window service for all the APMCs related to information and services. The e-NAM system was initially launched in pilot phase on 14th April 2016 in 8 states across the country. By March 2023, totally 1361 APMCs were on boarded with online system in 23 States and 4 UTDs in India. In Haryana state, e-NAM was also launched in pilot phase by covering two APMCs of state named Karnal and Ellenabad. Recently, 108 mandis are linked with e-NAM in Haryana (www.enam.gov.in). Because this online system is working in the Haryana state from its time of launch, the present study has been undertaken in Karnal APMC of Haryana State with the following stipulated objectives:

Objectives of the Study

- To assess the market profile and the status of e-NAM in Karnal APMC.
- To examine the prices and arrivals pattern of major agricultural commodities before and after implementation of e-NAM in the study area of Karnal APMC

Methodology

The present study has been carried out in Karnal APMC of Haryana state. Karnal APMC was selected respectively from the pilot phases on the basis of maximum traded quantity on e-NAM platform by using the trade summary report for 81 APMCS from 14th April 2016 to 31st January 2021. The study used Primary and secondary both types of data.



The required primary information was collected for the year 2020-21. The secondary data related to income, expenditure, prices and arrivals of major agricultural commodities of selected APMC were collected for the time period before (2011-12 to 2015-16) and after (2016-17 to 2020-21) e-NAM implementation. The required primary information about APMC related to the present study have been collected from the APMC officials with the help of well structured schedule while the secondary data have been obtained from various published and unpublished reports of Karnal APMC. The data were analyzed by using statistical tools such as average, percentage, absolute change, relative change and Compound growth rate.

Results and Discussion

The basic information and characteristics of the Karnal APMC have been exhibited in table 1. Karnal APMC was established in the year 1961 and was integrated with electronic trading portal in the year 2016. In APMC, sale begins at 10 AM and ends at 6 PM. Peak trading hours were reported from 10:00 AM to 12:00 AM. The number of villages covered by Karnal APMC was 43. The numbers of farmers 57068 and traders 366 were registered in Karnal APMC. Wheat and paddy were found as the major agricultural commodities of Karnal APMC. The turnover was calculated at Rs. 416188897 in Karnal APMC.

Table 1
Basic Characteristics of Karnal APMC

Particulars	Karnal
	Information
District	Karnal
City	Karnal
Year of the establishment of APMC	1961
e-NAM Introduced in APMC	14 April,2016 (Pilot Phase)
Name nearest railway station	Karnal
Distance from railway station	8 Km
Nearest national/ state highway	NH 44
Sale begins in APMC	10 AM
Sale ends in APMC	6 PM
Peak trading hours	10 AM-12AM
Number of Villages covered by APMC	43
Numbers of Farmers registered	57068
Number of traders registered	366
Major Commodities of the APMC	Wheat and Paddy
Turnover of the APMC (Rs.)	416188897

Source: Karnal APMC



Table 2 presents the details of permanent and outsourcing staff members of Karnal APMC. The total numbers of post-sanctioned and present filled in Karnal APMC were 69 and 34 respectively. It clearly observed that the present filled post of staffing pattern and staff strength were less as 49.27 per cent of total sanctioned post in Karnal APMC. It can be noted easily from

Table 2
Staff Pattern of Karnal APMC

Particulars	Karnal	
	Total No. of Post Sanctioned	Present Post Filled
President	-	-
Mandi Supervisors	4	2
Secretary	1	1
Assistant Secretary	1	1
Assistant supervisors	-	-
Accountant	2	1
Auction recorder	16	14
Computer operator/IT staff	2	2
Peon	5	2
Watchmen	6	2
Mandi analyst	-	-
Grading Staff	-	-
Other	32	9
Total	69	34
Total filled posts as percentage of total sanctioned Post	49.27	

Source: Karnal APMC.

the results of the study that staffing pattern of the selected APMC not fulfilled the all requirements of staff strength of APMC.

Table 3
Arrivals and Traded Quantity of Commodities in Karnal APMC

Years	Karnal			
	Total No. of Arrived lots	Total No. of Traded lots	Traded Quantity (In Lac qtls.)	Traded value (In Rs. Crore)
2016-17	42997	16169	842584.82	136.45
2017-18	86276	15417	1012350.35	184.09
2018-19	20481	5862	221536.55	45.81
2019-20	2170	146	4953.61	13.91
2020-21	7742	2936	119539	23.31
C.G.R.	-50.90	-55.40	-60.20	-56.90

Source: Karnal APMC



The arrivals and traded quantity pattern of commodities in Karnal APMC after e-NAM implementation has been depicted in the table 3 during the period 2016-17 to 2020-21. In Karnal APMC, compound growth rate for all the parameters taken for the present study i.e total number of arrived lots, traded lots, traded quantity and traded value has been found negative and estimated as -50.90, -55.40, -60.20 and -56.90, respectively which indicated that the progress of arrived lots, traded quantity and traded value was remained satisfactory in the initial years of implementation of e-NAM, however the growth of these parameters have been declined with the passage of time. Whereas, the total number of traded lots continuously declined from the initial year to the year 2019-20 after that in the year 2020-21 the total number of traded lots increased. The details of income and expenditure of Karnal APMC before (from the year 2011-12 to the year 2015-16) and after e-NAM implementation (from the year 2016-17 to the year 2020-21) have been presented in table 4. The table exhibits that before and after implementation of e-NAM in Karnal APMC, income and expenditure both has varied over the years. Before e-NAM on an average income of APMC was estimated as Rs. 26.73 this was increased after the implementation of e-NAM and accounted Rs. 28.57.

Table 4
Income and Expenditure of Karnal APMC

(Amounts in Crore Rs.)

Years	Karnal			
	Before e-NAM			
	Total Income	Development Expenditure	Total Expenditure	Net Surplus/ Deficit
2011-12	23.91	15.13	22.31	1.60
2012-13	20.88	7.03	11.84	9.04
2013-14	24.45	14.28	20.75	3.70
2014-15	42.31	0	57.50	-15.19
2015-16	22.09	0	9.75	12.34
After e-NAM				
2016-17	23.75	19.20	25.07	-1.32
2017-18	33.69	15.25	22.21	11.48
2018-19	28.58	11.00	31.84	-3.26
2019-20	37.46	11.08	28.77	8.69
2020-21	19.38	14.96	31.79	-12.41
Average Total Income and Expenditure Before e-NAM	26.73	7.29	24.43	2.30
Average Total Income and Expenditure After e-NAM	28.57	14.30	27.94	0.64

Source: Karnal APMC



Similarly, after implementation of e-NAM average expenditure of APMC was also increased from Rs.24.43 crore to 27.94 crore. Average development expenditure which was remained Rs. 7.29 crore before e-NAM was recorded near about double after implementation of e-NAM. Before implementation of e-NAM in the APMC, the maximum net surplus was estimated in the year 2015-16 as rupees 12.34 crore followed by the year 2012-13 as 9.04 crore. The maximum deficit was accounted Rs. 15.19 crore in the year 2014-15. During this year, the development expenditure was recorded zero after that, more expenditure exceeds income. After implementation of the e-NAM, the maximum net surplus was evaluated rupees 11.48 crore during the year 2017-18 followed by the year 2019-20 as Rs. 8.69 crore. In the APMC, maximum net deficit was remained in the year 2020-21 and as rupees 12.41 crore. During the year, about 78 per cent of the total income of APMC was used for the developmental work. On an average net surplus of APMC was noticed for the both types of period before and after implementation e-NAM system; however it was recorded higher in case of before implementation period than after implementation period of e-NAM.

Table 5
Status of Infrastructure availability in Karnal APMC

Particulars	Karnal APMC	Particulars	Karnal APMC
	Yes/No		Yes/No
Administrative building	Yes	M/POS Machine	Yes
Warehouse	Yes	Generator	Yes
Stalls/Shops	Yes	CCTV camera	Yes
Rest house for workers	Yes	Computer	Yes
Rest house for farmers	Yes	Printer	Yes
Parking	Yes	Loudspeaker	Yes
Streetlight	Yes	Internet	Yes
Paved road	Yes	Online website	Yes
Fire prevention devices	Yes	Online Payment	Yes
Common covered platform	Yes	Trading Licenses	Yes
Common open platform	Yes	Recording of arrivals	Yes
Bidding /Conference hall	Yes	Stacking	Yes
Proper Transport arrangements	No	Loading	Yes
Compound wall	Yes	Unloading	Yes
Water Supply	Yes	Stacking /Unloading	Yes
Sanitary	Yes	Weighing	Yes
Bank branch/Bank service centre	Yes	Supervision of sale	Yes



Necessary Infrastructure Facilities Required for Implementation of e-NAM			
Generation of electronic entry pass	Yes	e-Agreements	Yes
Assaying lab	Yes	Generation of sale receipt	Yes
Electronic bidding	Yes	Integration of weighment to e-NAM portal	Yes
Electronic Display	Yes	Warehouse Integration	Yes
Announcing highest bid price to farmer by SMS	Yes	Generation of electronic exit pass	Yes
Online settlement	Yes		

Source: Karnal APMC

The status of infrastructure facilities in Karnal APMC of Haryana including the basic infrastructure for proper functioning of APMC and required infrastructure for implementation of e-NAM has been presented in table 5. The table highlights that all the basic facilities and services for proper functioning of APMC were attained by the Karnal APMC except the only of facility of proper transport arrangements which was found missing. In case of required infrastructure facilities for implementation of e-NAM, all the necessary required infrastructure for implementation of e-NAM such as generation of electronic entry pass, electronic bidding, assaying lab, electronic display, announcing highest bid price to farmer by SMS, online settlement, e-Agreements, generation of sale receipt, warehouse integration, integration of weighment to e-NAM portal and generation of electronic exit pass was available in Karnal APMC which showed that the APMC was fully facilitated and serving better to the stakeholders.



Table 6
Yearly Average Prices of Major Commodities before and after e-NAM in Karnal APMC of Haryana

(In Rupees)

Years	Karnal APMC	
	Wheat	Paddy
Before e-NAM		
2011-12	1285	2000
2012-13	1350	2250
2013-14	1400	3425
2014-15	1450	2300
2015-16	1525	2000
After e-NAM		
2016-17	1625	2200
2017-18	1735	2775
2018-19	1842	2675
2019-20	1929	2958
2020-21	1981	3134
Before e-NAM Average Price (qtls)	1402	2395
Before Standard Deviation	91.96	592.24
Coefficient of variation	6.56	24.73
After e-NAM Average Price(qtls)	1822.40	2748.40
After Standard Deviation	144.49	353.36
Coefficient of variation	7.93	12.86
Absolute Change	420.40	353.40
Relative Change	29.98	14.75

Source: Karnal APMC

Table 6 shows the yearly (2011-12 to 2020-21) price pattern of major commodities before and after the implementation of e-NAM in Karnal APMC. The table explains the absolute and relative change in average prices of major agricultural commodities after implementation of e-NAM in selected APMC. In Karnal APMC, after the implementation of e-NAM, the incremental changes were found in the price of wheat and paddy. The higher positive incremental changes were found in prices of wheat crop (29.98 per cent), followed by paddy crop (14.75 per cent). Thus, in Karnal APMC, positive trends were recorded in the case of prices of wheat and paddy crops. The table also explained the coefficient of variation; before and after e-NAM implementation, the higher coefficient of variation was recorded in the prices of paddy as compare to wheat crop. The results indicated yearly average prices of major crops accounted for increasing change. More farmers and traders' participation in the e-NAM market was discovered to be the leading cause of an increase in prices of major selected crops after the implementation of the e-NAM.



Table 7

Yearly Arrivals of Major Commodities before and after e-NAM in Karnal APMC of Haryana
(In quintals)

Years	Karnal APMC		
	Wheat	Paddy	Total
Before e-NAM			
2011-12	1250809.00	3056139.00	4306948.00
2012-13	1213557.00	578006.00	1791563.00
2013-14	1230956.00	3059521.00	4290477.00
2014-15	1138742.00	3868264.00	5001006.00
2015-16	1311344.00	5002407.00	6313751.00
After e-NAM			
2016-17	1419004.00	4386145.00	5805149.00
2017-18	2885059.00	593475.00	3478534.00
2018-19	1687594.00	694316.00	2381910.00
2019-20	1866411.00	729510.00	2595921.00
2020-21	1240890.00	3363240.00	4604130.00
Before e-NAM Average Arrivals (qtls)	1229082.00	3112867.00	4340749.00
Before e-NAM Standard deviation	62539.89	1625774.00	1645501.00
Coefficient of variation	5.09	52.23	37.91
After e-NAM Average Arrivals(qtls)	1819792.00	1953337.00	3305849.00
After e-NAM standard deviation	642300.90	1791542.00	2126948.00
Coefficient of variation	35.29	91.72	64.34
Absolute Change	590710.00	-1159530.00	-1034900.00
Relative Change	48.06	-37.25	-23.84

Source: Karnal APMC

Note: * Mustard and Cotton crops were found missing in Karnal APMC

Yearly arrivals of major commodities before and after the implementation of e-NAM in Karnal APMC for the year 2011-12 to 2020-21 have been presented in Table 7. It observed that after the implementation of e-NAM in Karnal APMC, the higher positive relative change was found in arrivals of Wheat at 48.06 per cent. The results are similar to the findings of Bachaspati (2018) in respect of Bhatapara APMC and Sekhar and Bhatt (2018) in respect of Pilukhera, Karnal and Sirsa APMCs. The negative relative change was found in Paddy crops as -37.25 per cent which shows that total arrivals of paddy was declined after the e-NAM implementation. The overall relative change was found as negative (-23.84 per cent) in Karnal APMC. Bachaspati (2018) and Sekhar and Bhatt (2018) in respect of fatehabad, Ellenabad and Sirsa APMCs found the similar observations in their study.



The table shows that before and after the e-NAM, higher coefficient of variation was found in case of the paddy crop. The overall change in average arrivals of major commodities was recorded as negative after the implementation of e-NAM in Karnal APMC. These results corroborate the findings of Bachaspati (2018) and Sekhar and Bhatt (2018) in respect of Karnal, Panipat, Sirsa and Fatehabad APMCs which revealed that the impact of e-NAM on arrivals of major commodities was negative.

Conclusion

The present study was conducted at Karnal APMC of Haryana state. It was established in the year 1961 and e-Nam was integrated into this APMC in the year 2016. The present study used primary as well as secondary data. In the present study, various tools and techniques was used for data analysis such as simple average method, absolute and relative change, standard deviation, co-efficient of variation and compound growth rate. The results depicted that, after the implementation of e-NAM in Karnal APMC, a negative growth rate was found in the total numbers of arrived lots, traded lots, traded value and traded quantity. The results highlighted that most of the essential infrastructure required for the implementation of e-NAM as per operational guidelines of e-NAM were successfully installed by Karnal APMC. While the facilities of Proper transport arrangements was missing. The study examined that after the implementation of e-NAM, the incremental changes were found in the price of wheat and paddy. The results show sthat after the implementation of e-NAM in Karnal APMC, the highest positive relative change was found in arrivals of wheat, while the negative relative change was found in paddy crops. The overall change in average arrivals of major commodities was negative after the implementation of e-NAM in Karnal APMC.



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