

**Infrastructure for Information and Communication Technology (ICT) Applications in
the Agriculture Produce Market Committees (APMCs) of Karnataka**

Dr. Neelamma R. Kolageri

Karnataka State Rural Development and Panchayat Raj University, Gadag

Abstract:

Agriculture is the most important sector of Indian Economy. Agricultural Marketing is a vibrant as agriculture. Even though the country has competitive markets there are loopholes in agricultural marketing system. Infrastructure facilities in marketing system serves as the wheels for carrying economic activities. The recent announcements on amendments in agriculture produce market act from the union government helps to overcome the problems in the market system. This paper was undertaken to study the infrastructure facilities available in selected agriculture produce markets of the Karnataka. Here the study has been focused on to know the infrastructure availability for electronic trading (e-trading) and electronic tendering (e-tendering). For the purpose of study a total of 13 markets have been selected based on the e-tendering and e-trading operation in the market. From the research study it has been observed that infrastructure in all the markets was adequate. The efficient utilisation of available infrastructure availability by stake holders increases the efficiency of markets and which ultimately helps the producers to obtain remunerative price for their produce. This lead to enhance the income of the producers.

Key Words: Infrastructure, Marketing, Tendering, Trading

Introduction

Agriculture is the most important sector of Indian Economy. It has changed dramatically around the world and in Indian scenario also. In India the agriculture situation has undergone a rapid change and achieved sensible growth rate in last few decades mainly due to technological innovation in the form of farm mechanization, extensive use of chemical fertilizers, specialization and increased investment in agricultural sector. The growth rate not only has to be maintained but also need to be increased and fluctuation in agriculture production has to be minimized.

Agricultural Marketing is a vibrant as agriculture. It is a sale of farm commodity and all related aspects of market system. India has a competitive markets for agricultural commodity at domestic and global level and developed banking system and higher educational institutions for the development for marketing structure. But the marketers need to build and enhance their strengths. Even though the country has competitive markets there are loopholes in agricultural marketing system like improper

storage facilities, inadequate market information, dominance of middlemen, lack of transport and communication. Infrastructure facilities in marketing system serves as the wheels for carrying economic activities. The sound market infrastructure system provides nourishment to production activity. Improved infrastructure is believed to be a primary driving force for commercialization. Market infrastructure is important not only for the performance of marketing functions and also for the expansion of market size for the transfer of appropriate price signals which expected to improve the marketing efficiency. Infrastructure facilities lead to reduction in marketing cost, which is crucial for increasing the income of farmers and reducing cost to the consumers. In order to improve the marketing system, encouraging and improving infrastructure facilities like grading, storage, warehousing, proper transportation, reduction of middlemen involvement, ICT application at all the stages of marketing of produce is essential at the regulated markets. In this connection the role of Agricultural Produce Marketing Committee (APMC) is pivotal in promoting the agricultural marketing. The adequate infrastructure accelerates the growth of the agricultural sector and in turn the entire economy development is assumed. To overcome the existing challenges in marketing system market committee have brought reforms in the APMC Model Act 2003's and came out with suggestions on e-tendering and e-trading of agricultural and allied commodities which has brought lime light on the recent reforms in the market. This reform of digitalisation in agriculture marketing system was like a path through which market efficiency can be achieved. Karnataka was the pioneer state in introducing this electronic tender and e-trading system reform to bring in efficiency, transparency and competitiveness in the regulated markets. This marketing system expected to bring efficiency in the operation of market functions and increase the producer share in the consumer rupee which is the end economic result of new reforms comes out by better and fair interactions of market structure and conduct of firms in the agricultural marketing system. Many of the studies has been conducted to assess the infrastructure availability at the market yard but study on infrastructure availability for e-tendering and e-trading is not available. Venkatachalam (2003) conducted a study on infrastructure and agricultural development in Karnataka state. Results of the study revealed that Karnataka State has achieved an impressive growth rate in the overall infrastructural development compared to other states in the country. Ashwini *et al.* (2013) analysed the problems and prospects with respect to marketing infrastructure in India. Results of the study revealed that, the infrastructure facilities in development were as necessary as foundation of a building. Navalur *et al.* (2013) studied the status of market infrastructure in Karnataka. The research study results found that the Karnataka's share in agriculture market infrastructure in India was very less and state should increase the investment in infrastructure. Based on this background the present has been conducted to

study the infrastructure availability in the selected markets and infrastructure availability for the electronic trading and tendering system.

OBJECTIVES OF THE STUDY

This paper was undertaken to study the infrastructure facilities available in selected agriculture produce markets of the Karnataka.

METHODOLOGY

In this paper an attempt has been made to assess the infrastructure availability in general and for e-tendering and e-trading system in selected markets. The research has been undertaken in the year 2017-18 for research purpose. For the study purpose primary information has been obtained from the thirteen selected markets. The 13 selected market have been selected as shown in below table, based on the implementation of e-tendering and e-trading in the markets as shown in below table. At present in most of the APMC market yard every commodity arrived is traded through e-tendering for major notified commodities. Only in few markets e-trading is taken for few notified commodities. Hence for the study, 3 markets were selected randomly where e-trading was in operation during the early periods. Data obtained is analysed through percentage analysis. The analysed results are presented in tabular form for better understanding of the results.

e-Tendering		
Sl. No.	Markets	Commodity
1	Bagalkot	Sorghum
2	Byadagi	Dry Chilli
3	Challakere	Turmeric
4	Chamarajanagar	Groundnut
5	Davanagere	Sunflower
6	Gadag	Bengalgram
7	Kalburgi	Redgram (Tur)
8	Hubballi	Greengram
9	Mysore	Paddy
10	Ranebennuru	Cotton
11	Shivamogga	Arecanut
12	Tiptur	Copra
13	Vijayapura	Maize
e-Trading		
Sl. No.	Markets	Commodity
1	Hubballi	Greengram
2	Mysore	Paddy
3	Tiptur	Copra

Results and Discussion

Infrastructural facilities available in the selected market yard are presented in the Table 1. According to the frequency level of infrastructure facilities available at the market yard among the thirteen markets five markets fell under the high frequency level, four markets were fell in the medium frequency level category and the other four remaining markets found to have low frequency level category infrastructure facilities. This indicates in general most of the infrastructure are available in the market yard.

Table 1. Infrastructure facilities available at the selected APMC market yard in Karnataka
N=13

Sl. No.	Infrastructure facilities	Selected Market Yard			
		Available (in numbers)	Percentage to total	Not Available (in numbers)	Percentage to total
1	Tender hall	13	100.00	0	0.00
2	Grading laboratories	11	84.62	2	15.38
3	Quality testing laboratories	9	69.23	4	30.77
4	Weighment under the supervision of licensed weighment	13	100.00	0	0.00
5	Weigh bridge and weighing scale	13	100.00	0	0.00
6	Sundry shops	12	92.31	1	7.69
7	Drying platforms	12	92.31	1	7.69
8	Cleaning system for the market yard	13	100.00	0	0.00
9	Security system for the market yard	13	100.00	0	0.00
10	Storage houses (ware houses) / Central warehouse	13	100.00	0	0.00
11	Internal roads and drains	13	100.00	0	0.00
12	Parking lots for the vehicles	13	100.00	0	0.00
13	Structures for loading and unloading	12	92.31	1	7.69
14	Farmer's information system /Kiosk	10	76.92	3	23.08
15	Market intelligence system	13	100.00	0	0.00
16	Registration office in cattle market	6	46.15	7	53.85
17	Settlement of disputes	11	84.62	2	15.38
18	Electricity	13	100.00	0	0.00
19	Canteens	13	100.00	0	0.00
20	Drinking water facility	13	100.00	0	0.00
21	Sanitary blocks	13	100.00	0	0.00
22	Banking facility	13	100.00	0	0.00
23	Farmer's rest house	11	84.62	2	15.38
24	Houses/Schools for hamals family	3	23.08	10	76.92
25	Garbage Disposal System	10	76.92	3	23.08
26	Vehicles provided for the transportation	12	92.31	1	7.69
27	Police station	2	15.38	11	84.62
28	Fertiliser shops	1	7.69	12	92.31
29	Pesticide and insecticides shops	1	7.69	12	92.31
30	Post office	6	46.15	7	53.85

Source: Records of the respective APMCs during 2017-18

Table 1a: Categorisation of selected markets according to frequency level of infrastructure availability

Sl. No.	Frequency level	Number of Markets	Percentage to Total
1	Low <{(Mean – (0.425 X SD))}	4	30.77
2	Medium {Mean ± (0.425 X SD)}	4	30.77
3	High > {Mean + (0.425 X SD)}	5	46.15
4	Total	13	100.00
5	Mean	47.38	
6	Standard deviation	6.23	

In Table 2 the infrastructural facilities available especially for farmers in the selected market yard is presented. The infrastructure facilities available to farmers at the market yard in selected market was categorised based on frequency level of infrastructure availability into high, medium and low category. Among the thirteen markets six markets found to be under the high frequency level of infrastructure availability, four markets fell under medium frequency level and three markets fell in low frequency category level of infrastructure availability. The results indicated the availability of infrastructures but also in general in another 50 per cent markets required improvement in infrastructure.

Table 2: Infrastructure facilities available to the farmers in market yards

N=13

Sl. No.	Infrastructure facilities	Selected Market Yards			
		Available (in numbers)	Percentage to total	Not Available (in numbers)	Percentage to total
1	Facility for display of produce in the yard	12	92.31	1	7.69
2	Drying yard facility	8	61.54	5	38.46
3	Packaging facility	13	100.00	0	0.00
4	Rest room facility	11	84.62	2	15.38
5	Notice /display board facility	13	100.00	0	0.00
6	Drinking water facility	13	100.00	0	0.00
7	Toilet and Sanitary facility	13	100.00	0	0.00
8	First aid facility	7	53.85	6	46.15
9	Proper road facility	13	100.00	0	0.00
10	Transport facility	13	100.00	0	0.00
11	Parking facility	13	100.00	0	0.00
12	Cleaning and Grading facility	13	100.00	0	0.00
13	Electronic weighing facility	13	100.00	0	0.00
14	Storage facility i.e. state ware house/ Central ware house facility in the yard	13	100.00	0	0.00

15	Storage facilities given by traders	13	100.00	0	0.00
16	Electronic billing facility	13	100.00	0	0.00
17	Electronic payment facility	4	30.77	9	69.23
18	Electronic market information facility in the yard	11	84.62	2	15.38

Table 2.a: Categorisation of selected markets according to frequency level of infrastructure availability to the farmers at the market yards

Sl. No.	Frequency level	Number of Markets	Percentage to Total
1	Low $< \{(\text{Mean} - (0.425 \times \text{SD}))\}$	4	30.77
2	Medium $\{ \text{Mean} \pm (0.425 \times \text{SD}) \}$	3	23.08
3	High $> \{ \text{Mean} + (0.425 \times \text{SD}) \}$	6	46.15
4	Total	13	100.00
5	Mean	33.08	
6	Standard deviation	3.71	

Source: Field Survey

For e-tendering operation in the market yard infrastructure facilities like computers, computer operators, internet facility, power availability, working cabin for each operator, tender hall, monitor/projector to display the bidding prices, mike to announce the bidding, assaying lab, assaying kit, grading lab, are necessary. Infrastructure facilities available for e-tendering in the selected APMC market yard are presented in the Table 3.

Table 3: Infrastructure facilities available for e-tendering in the selected APMC market yards

N=13

Sl. No.	Infrastructure facilities	Selected market yards			
		Available (in numbers)	Percentage to total	Not Available (in numbers)	Percentage to total
1	No of Computer operators				
	<5	5	38.46	0	0.00
	5-10	8	61.54	0	0.00
	>10	0	0.00	0	0.00
	Sub Total	13	100.00	0	0.00
2	No of computers				
	<5	0	0.00	0	0.00
	5-10	8	61.54	0	0.00
	>10	5	38.46	0	0.00
	Sub Total	13	100.00	0	0.00
3	No of computers for e-tender				
	<5	0	0.00	0	0.00
	5-10	9	69.23	0	0.00
	>10	4	30.77	0	0.00

	Sub Total	13	100.00	0	0.00
4	Working cabin for each operator				
	<5	0	0.00	0	0.00
	5-10	8	61.54	0	0.00
	>10	5	38.46	0	0.00
	Sub Total	13	100.00	0	0.00
5	Uninterrupted Internet Connection	10	76.92	3	23.08
6	LAN connection (internet connection in case of any interruptions)	10	76.92	3	23.08
7	Continuous(uninterrupted) power supply	11	84.62	2	15.38
8	Power backup in case of power failure	8	61.54	5	38.46
9	Tender hall	13	100.00	0	0.00
10	Projector (monitor) to view the tender	12	92.31	1	7.69
11	Mike for announcing the bids	8	61.54	5	38.46
12	Assaying Lab	10	76.92	3	23.08
13	Assaying kit				
	Plates for holding samples	7	53.85	6	46.15
	Scoopers	7	53.85	6	46.15
	Forceps	7	53.85	6	46.15
	Moisture meter	7	53.85	6	46.15
	Electronic weighing balance	7	53.85	6	46.15
14	Grading Lab	11	84.62	2	15.38

Source: Records of the respective APMCs during 2017-18

Among thirteen market in eight markets (61.54 per cent) were found to have less than five operators and the remaining five markets (38.46 per cent) found to have 5 to 10 computer operators. In eight markets (61.54 per cent) 5-10 computers found available for e-tender system with separate working cabin for each computer operator. In the remaining five markets (38.46 per cent) more than 10 computers with separate working cabin for each computer operator were found available. In the nine markets (69.23 per cent) 5-10 computers were found available for e-tendering process and more than ten computers were available in the remaining four markets (30.77 per cent). Projector (monitor) to view the tender was available in the twelve market In 11 markets (84.62 per cent) market officials said that they have the continuous power supply and grading lab. Among the thirteen markets ten markets had (76.92 per cent) Uninterrupted internet connection, LAN (Local area network) connection (internet connection in case of any interruptions) and assaying lab. Eight markets (61.54 per cent) had the power backup in case of power failure and mike for announcing the bids. In seven markets assaying kit consisting of Plates for holding samples, Scoopers, Forceps, Moisture meter and Electronic weighing balance was found available. The above

indicated that, the system requires additional facilities for uninterrupted power supply and assaying facilities in the market.

Table 4: Infrastructure facilities available for e-trading in the selected market

n=3

Sl. No.	Infrastructure facilities	Selected Markets			
		Available (in numbers)	Percentage to total	Not Available (in numbers)	Percentage to total
1	Assaying Lab	3	100.00	0	0.00
2	Grading Lab	2	66.67	1	33.33
3	Assaying Kit				
	Plates for holding samples	2	66.67	1	33.33
	Scoopers	2	66.67	1	33.33
	Forceps	2	66.67	1	33.33
	Moisture meter	2	66.67	1	33.33
	Electronic weighing balance	2	66.67	1	33.33
4	Computers	3	100.00	0	0.00
5	Power backup in case of power failure	3	100.00	0	0.00
6	Continuous internet Supply	3	100.00	0	0.00
7	LAN backup in case of internet failure	2	66.67	1	33.33

Source: Field Survey

Infrastructure facilities for e-trading available at the market yard are presented in the Table 4. From the results it is found that in all the three markets (100.00 per cent) assaying lab, computers for e-trading, power backup in case of power failure and continuous internet supply were found available. Among the three markets two markets (66.67 per cent) found to have grading lab, assaying kit consisting plates for holding samples, scoopers, forceps, moisture meter, electronic weighing balance and LAN (Local area network) backup in case of internet failure. It indicated that required infrastructure needs to be strengthened in two markets.

Conclusion

Majority of the markets found to have enough infrastructure availability in general and with respect to the farmers. Even though, the infrastructure facilities is adequate the stake holders need to be encouraged to use the available facilities in efficient form to enhance the market efficiency which in turn helps the farmers to sell their agriculture produce at better price and in better form. The infrastructure availability for e-tendering and e-trading in selected markets were available in good numbers but there is need to bring more exposure to this new electronic trading and tendering operation among all the stake holders and farmers. This in turn helps to bring transparent and efficient marketing practice which helps the farmers to obtain better remuneration.

References

Ashwini, B. C., Bhavya, A. P. and Kiresur, V. R., 2013, Marketing infrastructure in India: Problems and prospects. *Indian J. Agril. Mktg.*, 27(3):47-52.

Navalur, N. P., Patil, B. O. and Tirlapur, L. N., 2013, Status of market infrastructure in India- A view of Karnataka, *Indian J. Agril. Mktg.*, 27(3): pp: 143.

Venkatachalam, L., 2003, Infrastructure and agricultural development in Karnataka state. Agricultural development & rural transformation (ADRT) unit institute for social and economic change Nagarbhavi, Bangalore, pp:1-42.