ANALYSIS OF e TRADING THROUGH RASHTRIYA ELECTRONIC MARKET SERVICES IN KARNATAKA

FATHIMA, H.

PALB 7151

DEPARTMENT OF AGRICULTURAL EXTENSION

UNIVERSITY OF AGRICULTURAL SCIENCES

GKVK, BENGALURU – 560 065

2019

ANALYSIS OF e TRADING THROUGH RASHTRIYA ELECTRONIC MARKET SERVICES IN KARNATAKA

FATHIMA, H.

PALB 7151

Thesis submitted to the

University of Agricultural Sciences, Bengaluru

In partial fulfillment of the requirements for the award of the degree of

Master of Science (Agriculture)

in

AGRICULTURAL EXTENSION

BENGALURU **AUGUST, 2019**


Affectionately
Dedicated to
My parents, siblings
and my guide

DEPARTMENT OF AGRICULTURAL EXTENSION
UNIVERSITY OF AGRICULTURAL SCIENCES
GKVK, BENGALURU- 560 065

CERTIFICATE

This is to certify that the thesis entitled **"ANALYSIS OF e TRADING THROUGH RASHTRIYA ELECTRONIC MARKET SERVICES IN KARNATAKA"** submitted by **Ms. FATHIMA, H.**, I.D. No. **PALB 7151** for the award of the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **AGRICULTURAL EXTENSION** to the University of Agricultural Sciences, Bengaluru, is a record of *bona-fide* research done by her during the period of her study in the university, under my guidance and supervision and no part of the thesis has been submitted for the award of any other degree, diploma, associateship, fellowship or any other similar titles.

BENGALURU
AUGUST, 2019

(B.N. MANJUNATHA)
Major Advisor

APPROVED BY:

Chairman : _____
(B.N. MANJUNATHA)

Members : 1. _____
(S.M. PILLE GOWDA)

2. _____
(S. S. PATIL)

3. _____
(C.M. SAVITHA)

ACKNOWLEDGEMENT

On the very outset of this report, I would like to extend my sincere and heartfelt obligation towards all the personages who have helped me in this endeavour. Without their active guidance, help, cooperation and encouragement, I would not have made headway in the project.

First of all, I am grateful to The Almighty God for establishing me to complete this study.

I wish to express my immense gratitude to ***Dr. B. N. Manjunatha,*** *Professor of Agril. Extension and Head Agricultural Technology Information Centre, University of Agricultural Sciences, GKVK Campus, Bangalore and Chairperson of Advisory Committee for his excellent guidance, valuable suggestions, continuous motivation and constant support throughout the entire period of my research. I really feel inadequacy of words to expree my sincere thanks to my guide for his wholehearted involvement in my research work.*

I owe a great sense of gratitude to ***Dr. Dr. S.M. Pille Gowda,*** *Professor and Extension leader, Directorate of Extension Hebbal, University of Agricultural Sciences, GKVK Campus, Bangalore and the advisory committee member, for his keen interest on every stage of my research work. His prompt inspirations, timely suggestions and kindness, enthusiasm and dynamic have enabled me to complete my work on time.*

I was fortunate enough to have ***Dr. S.S. Patil,*** *Professor and Head, Department of Agricultural Statistics, Applied Mathematics and Computer Sciences, GKVK, UAS Bangalore as a member of my advisory committee and I am thankful to him for his advice, constructive suggestions and constant interest in my research work throughout the completion of the study.*

My sincere thanks to ***Dr. (Smt) C.M. Savitha****, Assistant Professor and Associate Editor, Communication Centre, UAS Bangalore for being my advisory committee member for his encouraging guidance, valuable suggestions and kind supervision in the completion of my research work.*

I am very grateful to the Head of the department and all the professors in the department who constantly encouraged me and supported me in all ways and in helped me in completion of my research work.

I am very grateful to the Directorate of Post Graduate Studies, University of Agricultural Sciences, GKVK Bengaluru, for providing me an opportunity to complete my master of technology and I am thankful to ***Dr. H.V. VijaykumarSwamy*** *Dean (PGS), University of Agricultural Sciences, Bengaluru.I am also thankful to* ***Dr. K.G. Banu Prakash,*** *Technical officer, Directorate of PG Studies for his support and encouragement.*

On a personal note, it is an immense pleasure to express my sincere gratitude and heartfelt respect to the blessings of my dearest parents ***Abdul Rahiman, H. and Safiya*** *and my beloved siblings* ***Zainuddin, Farzana and Zaheer*** *and my family members for kind blessings and constant support in my entire educational career.*

Knowing that whenever I am in trouble there is a friend ready to help me makes everything easier, I would like to say my special thanks to my dearest friends Chaithra, Navya, Damini, Ashwini, Jagadeesh, Vijayaraj, Chithrashree, Madhu, Sanjay, Puneeth, Archana, Chandan, Debi Kalyan, Manu nayak, and Pavithra for their great support, patience, love, affection and sharing both bad and good moments with them is the best part of the life.

My special thanks to my dearest friends Likshitha S, Shreya, Nayana, Aishwarya, I C Kariappa, Mohith, Arjun, Shravya, Shruthi and Harin for their support, love and affection.

My special thanks to Somaiah K.P. for his constant support throughout my research work.

Selfless love is the dearest commodity on this planet and only a few in this world are kind enough to extend their helping hands, just for love and affection shown to me by my juniors and seniors, especially Tanveer ahmed, Mahalakshmi and Akka Mahadevi.

My heartful thanks to the farmers, traders, and APMC officials of Davanagere and Chamarajanagara district for their support in the giving information for my research work.

One last word; since it is practically impossible to list all the names who contributed to my work, it seems proper to issue a blanket of thanks for those who helped me directly or indirectly during the course of study.

At last but not least gratitude goes to all of my friends who directly or indirectly helped me to complete this work.

Any omission in this brief acknowledgment does not mean lack of gratitude.

PLACE: BENGALURU
AUGUST, 2019 **(FATHIMA, H.)**

ANALYSIS OF e TRADING THROUGH RASHTRIYA ELECTRONIC MARKET SERVICES IN KARNATAKA

FATHIMA, H.

ABSTRACT

Rasthriya Electronic Market Services is one of the interventions in agricultural produce marketing in Karnataka, implemented in 2014 which is objected to bring efficiency, transparency and to realize competitive price to the farm produce. The present study was conducted in Davanagere and Chamarajanagara district of Karnataka during 2018-19. A sample of 40 farmers and 20 traders from each district, and also 40 non ReMS farmers were interviewed to study the set objectives. Nearly half of the farmers of Davanagere (47.50%) and Chamarajanagara (40.00%) have medium level of awareness about the trading practices followed in ReMS. High level (52.50%) of awareness is observed from the traders of ReMS. The overall perception of farmers about ReMS trading is poor (43.75%) whereas, ReMS traders have better (45.00%) perception about performance of ReMS. Infrastructures like unified licence, e permit, electronic weighment and bid management hall were utilized to the extent of cent per cent by the traders of Davanagere and Chamarajanagara. Major constraints enlisted by the farmers were lack of computer literacy, difficulty in understanding ReMS trade process and non-availability of market and price information. Glitches in the ReMS application, Poor internet connectivity and inadequate grading facility were the constraints enlisted by traders.

August, 2019

College of Agriculture,
GKVK, UAS, Bengaluru-65

(B. N. Manjunatha)
Major Advisor

ಕರ್ನಾಟಕದಲ್ಲಿ ರಾಷ್ಟ್ರೀಯ ವಿದ್ಯುನ್ಮಾನ ಮಾರುಕಟ್ಟೆ ಸೇವೆಗಳ ಮೂಲಕ ಇ–ವಹಿವಾಟಿನ ವಿಶ್ಲೇಷಣೆ

ಫಾತಿಮಾ, ಎಚ್.

ಸಾರಾಂಶ

ರಾಷ್ಟ್ರೀಯ ವಿದ್ಯುನ್ಮಾನ ಮಾರುಕಟ್ಟೆ ಸೇವೆಗಳು ಕರ್ನಾಟಕದ ಕೃಷಿ ಉತ್ಪನ್ನಗಳ ಮಾರಾಟದ ಮಧ್ಯಸ್ಥಿಕೆಗಳಲ್ಲಿ ಒಂದಾಗಿದ್ದು ಈ ಸೇವೆಯನ್ನು 2014ರಲ್ಲಿ ಜಾರಿಗೆ ತರಲಾಯಿತು. ಇದು ದಕ್ಷತೆ, ಪಾರದರ್ಶಕತೆ ಮತ್ತು ಕೃಷಿ ಉತ್ಪನ್ನಗಳಿಗೆ ಸ್ಪರ್ಧಾತ್ಮಕ ಬೆಲೆಯನ್ನು ಸಾಧಿಸಲು ಆಕ್ಷೇಪಿಸಲಾಗಿದೆ. ಪ್ರಸ್ತುತ ಅಧ್ಯಯನವನ್ನು 2018–19ರ ಅವಧಿಯಲ್ಲಿ ಕರ್ನಾಟಕದ ದಾವಣಗೆರೆ ಮತ್ತು ಚಾಮರಾಜನಗರ ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಕೈಗೊಳ್ಳಲಾಯಿತು. ನಿಗದಿತ ಉದ್ದೇಶಗಳನ್ನು ಅಧ್ಯಯನ ಮಾಡಲು ಪ್ರತಿ ಜಿಲ್ಲೆಯಿಂದ 40 ರೈತರು ಮತ್ತು 20 ವ್ಯಾಪಾರಿಗಳು ಮತ್ತು 40 ಆರ್ಇಎಂಎಸ್ ಅಲ್ಲದ ರೈತರನ್ನು ಸಂದರ್ಶಿಸಲಾಯಿತು. ಸುಮಾರು ಅರ್ಧದಷ್ಟು ದಾವಣಗೆರೆ (47.50%) ಮತ್ತು ಚಾಮರಾಜನಗರ ಜಿಲ್ಲೆಗಳ (40.00%) ರೈತರು ಆರ್ಇಎಂಎಸ್‌ನಲ್ಲಿ ಅನುಸರಿಸುತ್ತಿರುವ ಪದ್ಧತಿಗಳ ಬಗ್ಗೆ ಮಧ್ಯಮ ಮಟ್ಟದ ಅರಿವನ್ನು ಹೊಂದಿದ್ದಾರೆ. ಹೆಚ್ಚಿನ ಮಟ್ಟದ (52.50%) ವಹಿವಾಟಿನ ಆರ್ಇಎಂಎಸ್ ವ್ಯಾಪಾರಿಗಳಲ್ಲಿ ಕಂಡುಬಂದಿದೆ. ಆರ್ಇಎಂಎಸ್ ವಹಿವಾಟಿನ ಬಗ್ಗೆ ರೈತರ ಒಟ್ಟಾರೆ ಗ್ರಹಿಕೆ (43.75%) ಕಳಪೆಯಾಗಿದೆ. ಆದರೆ, ಆರ್ಇಎಂಎಸ್ ವ್ಯಾಪಾರಿಗಳು ಆರ್ಇಎಂಎಸ್‌ನ ಕಾರ್ಯಕ್ಷಮತೆಯ ಬಗ್ಗೆ ಉತ್ತಮವಾದ (45.00%) ಗ್ರಹಿಕೆ ಹೊಂದಿದ್ದಾರೆ. ಏಕೀಕೃತ ಪರವಾಗಿ, ಇ–ಪರ್ಮಿಟ್, ಎಲೆಕ್ಟ್ರಾನಿಕ್ ತೂಕ ಮತ್ತು ಬಿಡ್ ಮ್ಯಾನೇಜ್‌ಮೆಂಟ್ ಹಾಲ್‌ನಂತಹ ಮೂಲ ಸೌಕರ್ಯಗಳನ್ನು ಶೇಕಡಾವಾರು ಮಟ್ಟಕ್ಕೆ ದಾವಣಗೆರೆ ಮತ್ತು ಚಾಮರಾಜನಗರ ಜಿಲ್ಲೆಗಳ ವ್ಯಾಪಾರಿಗಳು ಬಳಸಿಕೊಂಡಿರುತ್ತಾರೆ. ಕಂಪ್ಯೂಟರ್ ಸಾಕ್ಷರತೆಯ ಕೊರತೆ, ಆರ್ಇಎಂಎಸ್ ವಹಿವಾಟಿನ ಪ್ರಕ್ರಿಯೆಯನ್ನು ಅರ್ಥಮಾಡಿಕೊಳ್ಳುವಲ್ಲಿನ ತೊಂದರೆ ಹಾಗೂ ಮಾರುಕಟ್ಟೆ ಮತ್ತು ಬೆಲೆ ಮಾಹಿತಿಯ ಲಭ್ಯತೆ ಇಲ್ಲದಿರುವುದು ರೈತರ ಪ್ರಮುಖ ತೊಂದರೆಗಳಾಗಿವೆ. ಆರ್ಇಎಂಎಸ್ ಅಪ್ಲಿಕೇಶನ್‌ನಲ್ಲಿನ ತೊಂದರೆಗಳು, ಕಳಪೆ ಅಂತರ್ಜಾಲ ಸಂಪರ್ಕ ಮತ್ತು ಅಸಮರ್ಪಕ ಗ್ರೇಡಿಂಗ್ ಸೌಲಭ್ಯಗಳನ್ನು ಪ್ರಮುಖ ತೊಂದರೆಗಳೆಂದು ವ್ಯಾಪಾರಿಗಳು ತಿಳಿಸಿದ್ದಾರೆ.

ಆಗಸ್ಟ್, 2019
ಕೃಷಿ ಕಾಲೇಜು
ಕೃಷಿ ವಿಶ್ವವಿದ್ಯಾನಿಲಯ, ಜಿ.ಕೆ.ವಿ.ಕೆ
ಬೆಂಗಳೂರು–560065

(ಬಿ.ಎನ್.ಮಂಜುನಾಥ)
ಪ್ರಮುಖ ಸಲಹೆಗಾರರು

Analysis of e-trading through Rashtriya electronic Market Services in Karnataka

FATHIMA, H PALB 7151 and MANJUNATHA, B.N.
Department of Agricultural Extension, UAS, GKVK, Bengaluru-560065

Introduction

Agricultural marketing in India has evolved from being restricted to catering to local demand to have interconnectivity between markets of other states. Karnataka has been the forerunner in market reforms and in devising innovative practices, came up with a leveraging technology in agricultural marketing system called Unified Market Platform (UMP).

In March 2013, a joint venture of Government of Karnataka and National Commodity Derivatives and Exchange (NCDEX) Spot Exchange Limited (NSPOT) having equal shareholding introduces UMP named Rashtriya e market Services (ReMS) for modernizing APMC regulated market yards into single online marketplace. These are the virtual markets with existence of physical markets at the backend, an electronic interface involving app, internet, server, payment gateways.

The model intends to increase transparency in all market operations, to enhance efficiency by use of Information Technology by effective dissemination of market price information to farmers and by increasing competition for better price realization. Also focuses to bring in financial linkages in Agricultural marketing. The success depends on requirement of all the parameters of e-trading acting in unison.

Objective

1. To assess the awareness and perception of farmers and traders about the trading practices followed in ReMS.

Material and Methods

Research design: Ex-post facto research design
Locale of the study: Davanagere and Chamarajanagara district of Karnataka

Davanagere Chamarajanagara

Selection of Respondents: The respondents were selected using random sampling procedure. A total of 120 beneficiary respondents *viz;* 60 from each district (40 Farmers, 20 Traders) were selected.
Data collection: Personal interview method
Statistical tools: Frequency, mean, percentage, standard deviation.

Results

Table 1: Awareness level of Farmers about ReMS (n=80)

Sl. No	Awareness level	Farmers						
		Davanagere (%)			Chamarajanagara (%)			Over All (%)
		e trade	e tender	total	e trade	e tender	total	
1.	Low	42.50	20.00	31.25	32.50	22.50	27.50	29.38
2.	Medium	35.00	0.00	17.50	42.50	0.00	21.25	19.38
3.	High	22.50	80.00	51.25	25.00	77.50	51.25	51.25

Table 2: Awareness level of Traders about ReMS (n=40)

Sl. No	Awareness level	Traders						
		Davanagere (%)			Chamarajanagara (%)			Over All (%)
		e trade	e tender	total	e trade	e tender	total	
1.	Low	40.00	0.00	20.00	45.00	0.00	22.50	21.25
2.	Medium	35.00	0.00	17.50	25.00	0.00	12.50	15.00
3.	High	25.00	100	62.50	30.00	100	65.00	63.75

Table 3: Perception of Farmers and Traders about the performance of ReMS (n=120)

Sl. No.	Perception level	Farmers and Traders					
		Davanagere (%)		Chamarajanagara (%)		Overall (%)	
		Farmers	Traders	Farmers	Traders	Farmers	Traders
1.	Poor	52.50	35.00	35.00	30.00	43.75	32.50
2.	Average	15.00	30.00	20.00	35.00	17.50	32.50
3.	Better	32.50	35.00	45.00	35.00	38.75	35.00

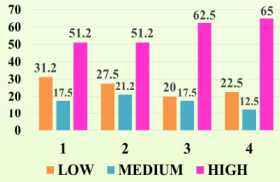


Fig. 1: Overall Awareness level of Farmers and Traders

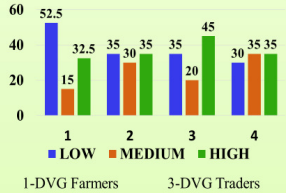


Fig. 2: Overall Perception of the Farmers and Traders

Discussion

Table 1 reveals that the 42.50 per cent of farmers of Davanagere has low level of awareness, whereas about e-tender it is high of 80.00 per cent. Chamarajanagara farmers has medium level of awareness about e-trade and has 77.50 per cent of high awareness about e tender. Overall awareness level of 80 farmers from both the district is high constituting 51.25 per cent.

Table 2 states that the Chamarajanagara traders have high level of awareness about ReMS which is 65.00 per cent. Traders from both the district have 100.00 per cent awareness about the e-tender process. Overall awareness of 40 traders about the functioning of ReMS from both the district was high constituting 63.75 per cent.

Table 3 shows the perception about performance of farmers and traders from both the district. Chamarajanagara farmers and traders have better perception compared with respondents from Davanagere . It reveals that farmers has low level of perception with 43.75 per cent and the traders have high level of perception on performance of ReMS, which constitutes upto 35.00 per cent. It is due to their exposure and publicity about ReMS.

Summary

Results of the study reveals that, higher level of awareness is observed from traders. Both farmers and traders have high level of awareness about e-tender process than e-trade process. The perception of farmers about the performance of ReMS is low as compared to the perception of traders. Overall farmers and traders of Chamarajanagara have higher level of awareness and perception about ReMS. It is suggested to organise more number of orientation/awareness programme about ReMS.

Advisory committee

Chairman: Dr. B. N. Manjunatha
Members : Dr. S. M. Pille Gowda
Dr. C. M. Savitha
Dr. S. S. Patil

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

I INTRODUCTION

In the past agriculture has played and will continue to play a dominant role in the growth of Indian economy in the foreseeable future. Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India and India's record of progress in agriculture over the past four decades has been quite impressive. The progressive growth in the field of agriculture resulted in meeting the constant demand for food. In the olden days selling of agricultural produce was easy as it was directly between the producer and to the consumer, in simple, barter system was followed with exchange of goods for goods and against services. Later, gradually with time, produce and goods were exchanged for money that led to the agricultural produce trading practices in traditional manner and with involvement of middlemen and commission agents, who kept their margins and moved the produce further to different channels, which turned gradually in to agricultural marketing concept.

Today, in current scenario agriculture markets are the hub of rural economy. Agricultural marketing today means more than linking the producer with consumer, it includes creation of favourable economic environment for farmers to enthuse them to grow more and get proceeds from transactions. The basic driver of agricultural marketing is marketable or marketed surplus. As the marketable surplus of a farmer increases, the need to have efficient markets and marketing systems becomes important. The marketable surplus of agriculture in India has shown a healthy, growing trend. From being a subsistence enterprise in the pre-Green Revolution period to market-oriented, commercial production, the great gap in Indian agricultural production has been covered and India is leading to self-sufficiency as well as export capacity in most crops. Present data of IBEF (India Brand Equity Foundation) shows that the Gross Value Added by agriculture, forestry and fishing is estimated at Rs 17.67 trillion (US$ 274.23 billion) in FY18. The Indian food and grocery market is the world's sixth largest, with retail contributing 70 per cent of the sales. During 2017-18 crop year, food grain production is estimated at record 284.83 million tonnes. In 2018-19, Government of India is targeting food grain production of 285.2 million tonnes.

The role of agricultural marketing in economic development was summarized as a means for optimization of resource use and output management, raising farm income, expanding the market geography, supporting and driving the growth of agro-based industries, employment generation, enhancing economic growth and improving the living standards. Thus agricultural marketing assumes significance not only to meet the food and nutrition needs of the country, but also to support the growth of the economy as a whole. A systemic change is required in agricultural marketing to cater to the emerging needs and for the sector to continue to play its constructive role in the rural and economic growth.

Agricultural marketing in India has evolved from being restricted to catering to local demand to have interconnectivity between markets of other states. Karnataka has been the forerunner in market reforms and in devising innovative practices and always came up with leveraging technologies in agricultural output markets. Its efforts can be understood as belonging to two phases. The first phase (2006-11) was focussed on amending the APMC Act based on the Model Act 2003 and on establishing an electronic platform i.e., e tender to support trading. The software was developed by the National Informatics Center (NIC), Bangalore, and the implementation was carried out by KEONICS (Karnataka State Electronic Development Corporation Limited), a state government organisation.

Method of operation of the e-tender system of sale: e tendering provides an end-to-end solution to computerize all the activities of the APMC's starting from in-gate entry to out-gate entry. It proposes to,

i) Capture incoming commodities at the gates of the markets.
ii) Make the traders to bid for the lots through computers/mobiles.
iii) Declare the maximum price bidder for the lot through computer.
iv) Record the weight of the lots into the computer.
v) Record the market fee collection on the computer.
vi) Generate the various reports of bidding and collection.
vii) Record the outgoing commodities at the gates of the markets

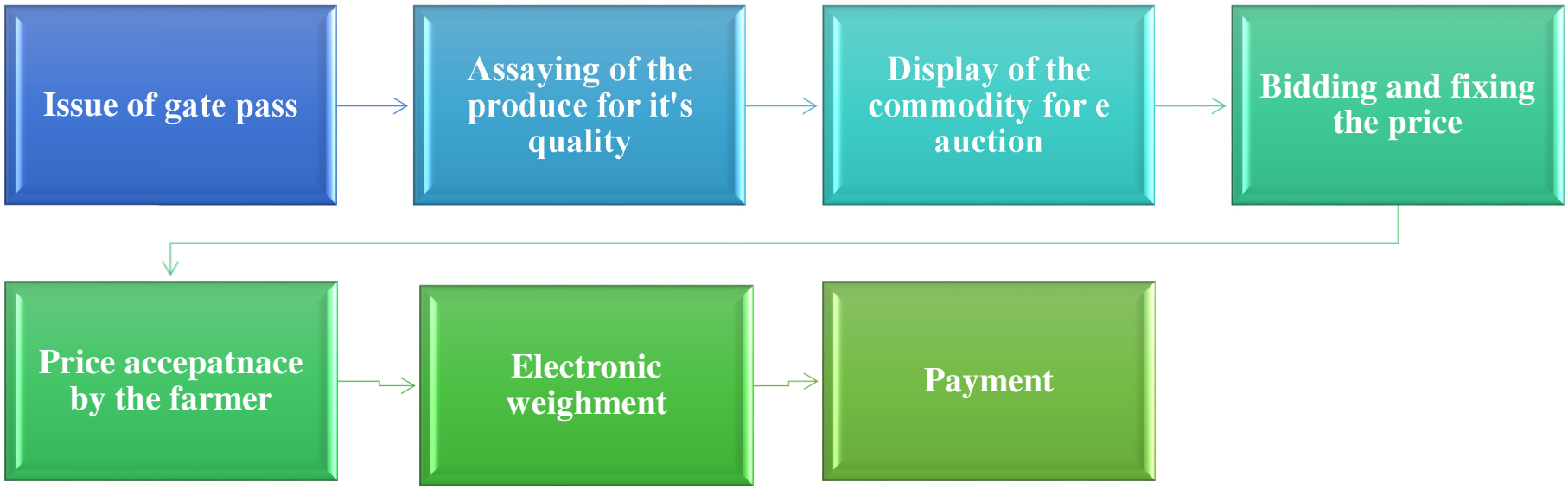


Fig. 1. Flow chart indicating e tender process in APMCs

Phase 1 reforms were cantered largely on automation of agricultural transactions. The implementation was left to local mandi authorities, which resulted in varying pace of reforms across mandis. There is no direct envisaging of credits of the crop sale to farmers bank account. Mandis worked on different IT systems and platforms that raised the costs of maintenance and made integration of markets difficult. Fig. 1 describes the process flow of e tender system.

The second phase (since 2011) represents a more holistic approach that combines more substantive legal-institutional reform with automation and unification - **the Karnataka Mode**l, the need to build enabling infrastructure that can incentivise private participation, promote competition and efficiency in the sale of agricultural produce. Technology interventions in all market operations to include capturing details of farmers, tracking of producer lot with unique Ids, displaying the lot in the auction screen along-with quality and quantity particulars, reconciliation of arrivals and exit of commodities by appropriate gate entries, integrating post auction process like weighment, payment, market fee collection and other administrative functions. Based on these needs Karnataka government passed the second amendment bill of **Karnataka Agricultural Produce Marketing (Regulation and Marketing) in 2013.** The recommendations made by the Agricultural Marketing Reforms Committee (2013) resulted in the formation of a crucial institutional innovation in the form a Special Purpose Vehicle - the Rashtriya e Market Services Private Limited (ReMS), which was established in 2014 as a joint venture between the Government of Karnataka and the NCDEX e-Markets Limited. The establishment of the ReMS represents a significant departure from the past. In its routine functioning, the ReMS is an implementing agency that works somewhat autonomously**.** It sought to combine the decision making of the private sector and accountability of government. The financial sustainability is guaranteed by the institution, hence 0.2 per cent of the value of the transacted produce is charged for providing various online services. A notable feature of this was the move to go beyond automation of individual mandis towards unification of markets. This entailed in the design of a unique and innovative project involving adoption of Information and Communication Tool, **Unified Market Platform(UMP)**for modernizing more than 300 APMC regulated market yards

into single online marketplace. The new software had provisions such as, inventory updation, e-tendering, invoice generation, goods in, goods out, settlement, assaying, market fee collection, online payment to farmers, facilitation of warehouse-based sales and single unified market licence system. Assayed parameters are displayed on the unified platform; these details enable a trader to place his bid without being physically present. Online payment system is expected to bring more transparency in the way a farmer gets paid for.

Figure 2 describes the process flow at market yard after automation, under e-trade mechanism. Under this system, when a farmer brings his produce to the APMC yard, his name, address, commodity name, number of bags, approximate weight is recorded. With a system-generated lot number issuance of gate pass which can be used as the reference, number for transactions in the commodity. The farmer has a choice to use the common platform or the platform of commission agent for auction of the produce. These lots are then assayed and information about quantity and quality is uploaded on the portal of ReMS. Buyers or traders who want to buy produce from the farmers these are the steps followed.

1. Register with ReMS by paying nominal fee
2. Get the unified market license from Directorate of Agricultural Marketing or by the person authorized by him, as per the Karnataka Agriculture Produce Marketing (Regulation and Development) Act 1966.
3. Keep some security deposit in the nationalized bank.
4. Each trader is given a username and password.
5. Buyer bids for the produce online from anywhere using her/his username and password.
6. A bid can be revised upward or downward any number of time before the closure of auction time.
7. Televisions are installed on mandis where the bid results are flashed after the closure of bidding time.

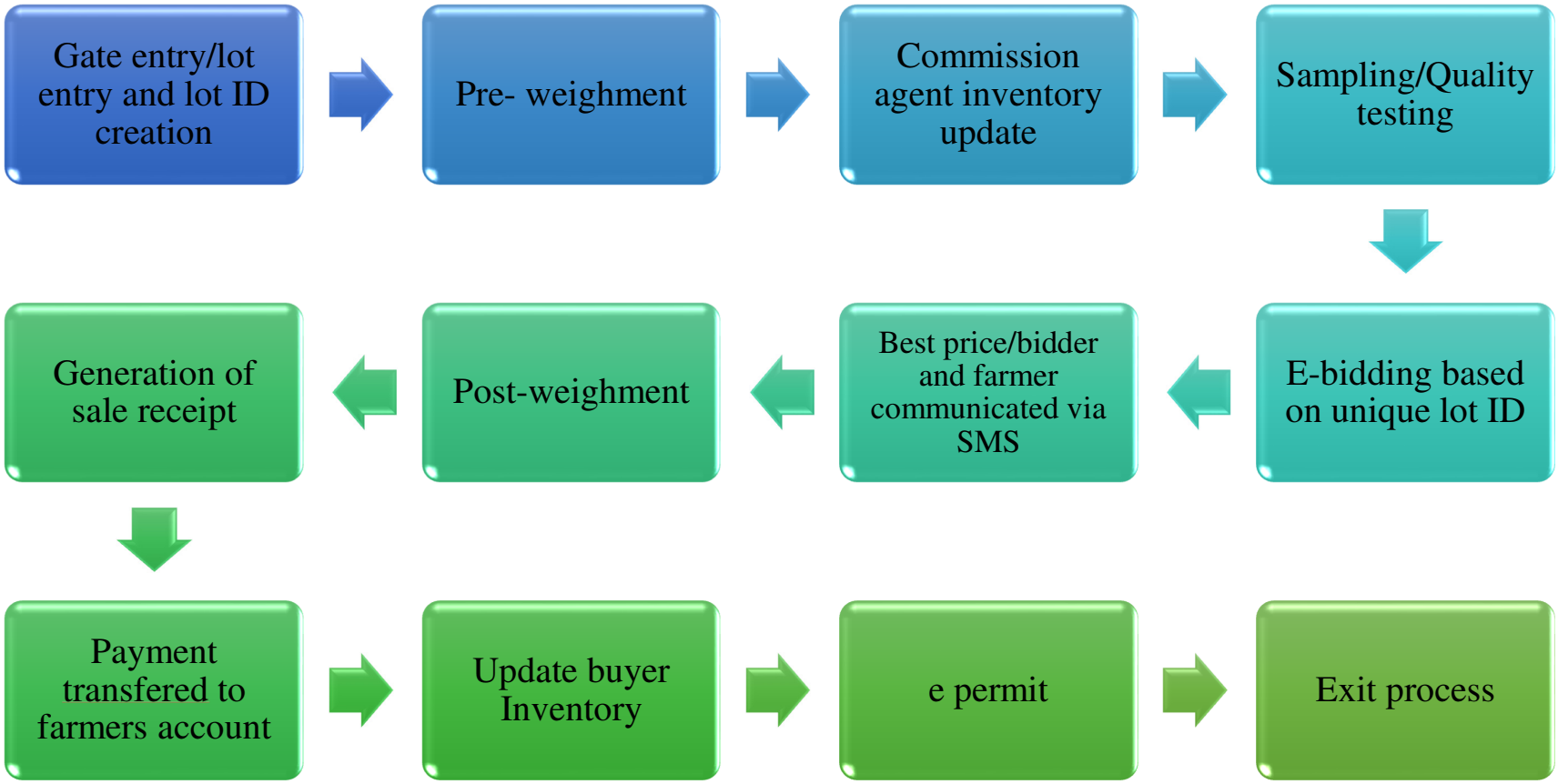


Fig. 2. Flow chart indicating e trade process in APMCs

8. Transactional SMS alert sent to the market participants to take decisions instantaneously.
9. The bid acceptance is given by the producer/seller i.e., Farmer. And the seller has the right to reject the bid, in which case a second round of bidding takes place on the same day and in the same way.
10. A bidder is required to keep a pre-bid margin of 5 per cent of value of the lot marked for sale with ReMS before opening of the tender.

This explains the entire procedure of bidding taking place in mandis or APMCs.

Post bidding activities like weighing, invoicing, market fee collection, accounting, payment of the sale proceeds directly to the farmers by traders and e permit generation made the ReMS trade more efficient and holistic trading.

Statement of research problem

Analysis of e trading through Rashtriya Electronic Market Services in Karnataka.

Specific objectives of the study

1. To assess the awareness and perception of farmers and traders about the trading practices followed in ReMS.
2. To analyze the extent of utilization of infrastructures created through ReMS by farmers and traders.
3. To know the price realization between conventional trading and e trading through ReMS.
4. To study the relationship between socio economic profile of farmers and traders with their awareness, extent of utilization and perception about performance of ReMS.
5. To analyze the constraints and suggestions in functioning of ReMS.

Scope of the study

The study will embark a light on the present status of functioning of ReMS. It leads on better understanding of awareness, perception and extent of utilization of ReMS infrastructures by farmers and traders. Factors to be keenly considered and areas which needs major reforms are explained. Hence, the study may help in making policy reforms. Study results will help government, administrators, planners, policy makers and others who are involved in implementing the scheme to modify/refine/rectify to move in the correct track.

Limitations of the study

As this study forms a part of the Master degree programme, is an effort to assess the Awareness level, perception and extent of utilization of infrastructures created through ReMS of farmers and traders. The time and other resources at the disposal of the student researcher were limited. The study was confined to Chamarajanagara and Davanagere district of Karnataka. Only 4 crops like, Turmeric, Groundnut, Paddy and Areca nut were considered for study. Therefore, the findings obtained cannot be generalized to other districts in the state. The study did not suffer due to any unusual limitations other than the common ones like time, finance, mobility and physical facilities. In spite of the limitations every effort was made by the researcher to keep this study as objective as possible. Hence, the findings of this study can be applicable where similar conditions exist.

Structure of Presentation

The thesis is divided into six chapters. The first chapter deals with the 'Introduction', in which the objectives, scope and limitation of the study are presented. The second chapter 'Review of literature' deals with the review of related studies in the light of the present investigation. The third chapter is devoted to the details of 'Methodology' used in the process of investigation, followed by the fourth chapter 'Results and Discussion', wherein, the presentation and interpretation of the findings of

the research study are presented. The fifth chapter 'Summary' contains the salient findings and implications of the study, followed by 'References' as fifth chapter.

Meaning and terms used in the study

Gate entry and lot ID generation: Farmers details as well as farm produce details are collected and entered on UMP platform and a unique identity number is given to the lot which is going to be e-auctioned. A unique device is used to enter the details and to generate unique ID of individual farmers. Gate entry device is shown in plate 1.

Assaying laboratory: It is the facility where Assaying staff will collect samples of the farm produce for testing of the commodity on standard quality parameters. The results are displayed on UMP prior bidding. Where equipment's are provided to test the quality parameters of agricultural produce. Plate 2.and plate 3. Shows the assaying laboratory. Plate 4. shows the uploading of quality parameters to the ReMS software.

E-tender/e-auction : Whether trading occurs through the online platform. The trade can happen either through an electronic tender or an electronic auction. Where bidding of the agriculture produce takes place on electronic interface. Plate 4 shows the e tender activity. Plate 5. Shows the sample e auction.

e-permit system: The commodities traded during a particular trade day require a permit from APMC to leave the market yard. This permit is generated electronically. Electronically generated exit passes to allow a traded commodity to leave the market yard, has been implemented in all the mandis. Plate 6. shows the sample e-permit.

e-payment system: Under which payments of sale proceeds would be transferred directly to farmers' bank accounts with ReMS acting as the clearing house in the settlement of trades. The rationale is to bring in more transparency in the way a farmer gets paid for his produce

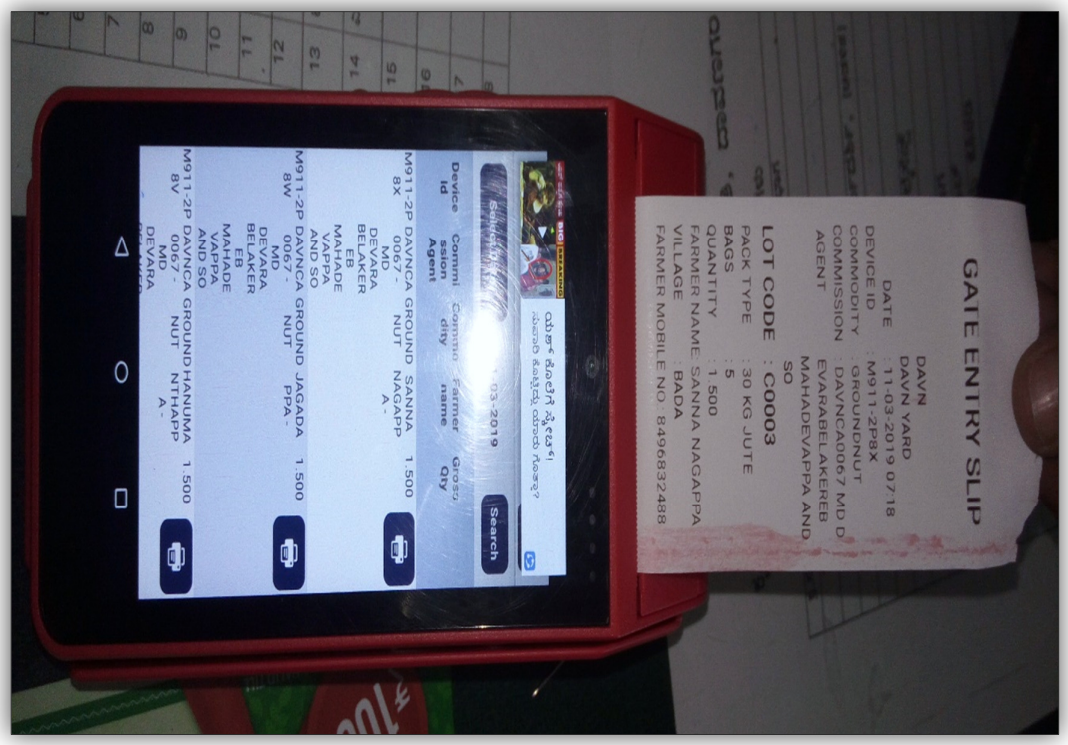
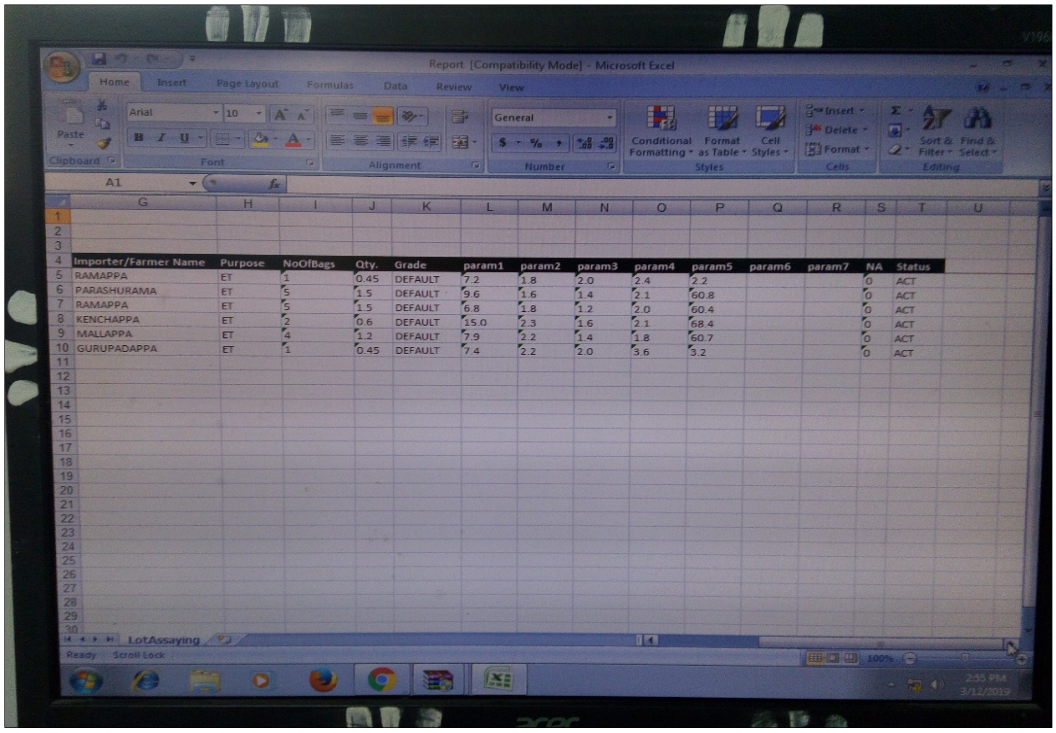


Plate 1. Showing gate entry device with unique lot ID slip

Plate 2. Showing Assaying laboratory in Chamarajanagara

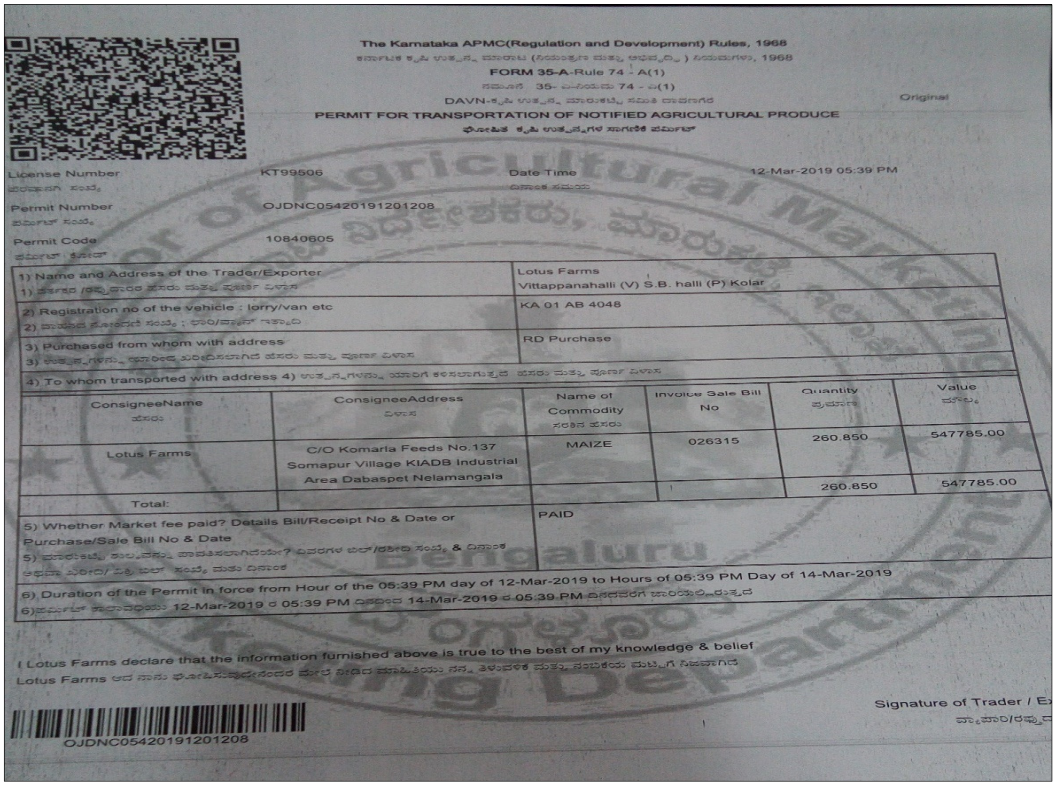
Plate 3. Showing Assaying laboratory in Davanagere

Plate 4. Trader participating in e auction



Importer/Farmer Name	Purpose	NoOfBags	Qty.	Grade	param1	param2	param3	param4	param5	param6	param7	NA	Status
RAMAPPA	ET	1	0.45	DEFAULT	7.2	1.8	2.0	2.4	2.2			0	ACT
PARASHURAMA	ET	5	1.5	DEFAULT	9.6	1.6	1.4	2.1	60.8			0	ACT
RAMAPPA	ET	5	1.5	DEFAULT	6.8	1.8	1.2	2.0	60.4			0	ACT
KENCHAPPA	ET	2	0.6	DEFAULT	15.0	2.3	1.6	2.1	68.4			0	ACT
MALLAPPA	ET	4	1.2	DEFAULT	7.9	2.2	1.4	1.8	60.7			0	ACT
GURUPADAPPA	ET	1	0.45	DEFAULT	7.4	2.2	2.0	3.6	3.2			0	ACT

Plate 5. Uploading quality parameters to ReMS software



The Karnataka APMC(Regulation and Development) Rules, 1968

FORM 35-A-Rule 74 - A(1)

DAVN-ಕೃಷಿ ಉತ್ಪನ್ನ ಮಾರುಕಟ್ಟೆ ಸಮಿತಿ ದಾವಣಗೆರೆ — Original

PERMIT FOR TRANSPORTATION OF NOTIFIED AGRICULTURAL PRODUCE

ಅಧಿಸೂಚಿತ ಕೃಷಿ ಉತ್ಪನ್ನಗಳ ಸಾಗಾಣಿಕೆ ಪರವಾನಿಗೆ

License Number: KT99506 — Date Time: 12-Mar-2019 05:39 PM

Permit Number: OJDNC05420191201208

Permit Code: 10840605

1) Name and Address of the Trader/Exporter	Lotus Farms Vittappanahalli (V) S.B. halli (P) Kolar
2) Registration no of the vehicle : lorry/van etc	KA 01 AB 4048
3) Purchased from whom with address	RD Purchase
4) To whom transported with address 4)	

ConsigneeName	ConsigneeAddress	Name of Commodity	Invoice Sale Bill No	Quantity	Value
Lotus Farms	C/O Komarla Feeds No.137 Somapur Village KIADB Industrial Area Dabaspet Nelamangala	MAIZE	026315	260.850	547785.00
Total:				260.850	547785.00

5) Whether Market fee paid? Details Bill/Receipt No & Date or Purchase/Sale Bill No & Date: PAID

6) Duration of the Permit in force from Hour of the 05:39 PM day of 12-Mar-2019 to Hours of 05:39 PM Day of 14-Mar-2019

6) 12-Mar-2019 ರ 05:39 PM ರಿಂದ 14-Mar-2019 ರ 05:39 PM ವರೆಗೆ ಮಾನ್ಯವಿರತಕ್ಕದ್ದು

I Lotus Farms declare that the information furnished above is true to the best of my knowledge & belief

Lotus Farms ರವರು ಘೋಷಿಸಿಕೊಳ್ಳುವುದೇನೆಂದರೆ ಮೇಲೆ ನೀಡಿದ ಮಾಹಿತಿಯು ನನ್ನ ತಿಳುವಳಿಕೆ ಮತ್ತು ನಂಬಿಕೆಯ ಮಟ್ಟಿಗೆ ನಿಜವಾಗಿದೆ

Signature of Trader / E

OJDNC05420191201208

Plate 6. E permit sheet

II REVIEW OF LITERATURE

A comprehensive review of literature is essential in any research endeavour as it provides a sound theoretical frame work for research. Apart from understanding the previous work done, the other main functions of citing review of literature is to provide a base for developing a tool and insight into the method/procedure to be used to reach the objective of research. It helps to work out a basis for interpretation of the findings. Keeping in view the objectives of the study, the literature found relevant to the present study were reviewed and brought out under the following sub-headings.

2.1 Personal, socio-economic, psychological and communication characteristics

2.2 Concept and measurement of awareness level of respondents

2.3 Concept and measurement of perception level of respondents

2.4 Concept and measurement of extent of utilization of infrastructures by respondents

2.5 Relationship between personal, socio-economic, psychological and communication characteristics of farmers with their awareness level

2.6 Relationship between personal, socio-economic, psychological and communication characteristics of farmers with their perception level

2.7 Relationship between personal, socio-economic, psychological and communication characteristics of farmers with extent of utilization of infrastructures by respondents.

2.8 Problems of respondents with performance of ReMS

2.9 Suggestions of farmers for effective functioning/implementation ReMS.

2.1 Concept and measurement of awareness level of respondents

Chengappa *et.al* (2012), conducted a study on IT application in agricultural marketing service delivery - electronic tender system in regulated markets. This study focuses on the application of Information Technology (IT) in the form of introduction of

e-tender system in the selected regulated agricultural markets of Karnataka has been found to improve the marketing efficiency through competitive and transparent bidding mechanism, and by minimization of manipulations in trading practices. Besides, a considerable time saving for all the stakeholders has been a clear outcome of e tender system. Results shows that awareness about the system was least among farmers (39%), and maximum among traders (52%). Majority of farmers are not much aware about the new system.

Jayasri (2014) in her study titled Farmers' awareness and perception on commodity futures market- A study with special reference to cardamom planters in Tamil nadu stated that, cent per cent of respondents have awareness on future market and online trading. It is also ascertained that all the planters have interest in futures trading.

Satish G. Athawale (2014) studied about APMC and e-trading for financial inclusiveness in Karnataka. The study focused on Information Technology (IT) in the form of introduction of e-tender, e-mandi, e-trading system in the selected regulated agricultural markets of Karnataka. Study reveals that less awareness level (30.00%) is observed from farmers. The efficiency of the system can be enhanced if end-to-end IT applications are introduced.

Lakshmi and Debashish (2015) conducted a study on Agricultural Marketing Information System- A case study of traders in Meghalaya stated that cent per cent of traders get market information from local market followed by 92.50 per cent of traders always informed about market arrivals.

Amarender Reddy (2016) in his study titled impact of e markets in Karnataka stated that 81.00 per cent of farmers were aware about e auction initiative and 75.00 per cent of farmers were aware about gate entry process.

Amarender Reddy (2016) in his study titled impact of e markets in Karnataka stated that 99.00 per cent of traders were aware about online payment which id directly transferred to farmers bank accounts and 95.00 per cent of traders were about the e auction process.

Girish (2017) in his study entitled by a study of e-tendering system and its impact on arrivals and prices of Bengal gram in Karnataka revealed that awareness of e-tendering trade among the farmers Gulbarga market. Where 46.66 per cent of the sample respondents were aware of e tendering. Awareness of e-tendering trade mechanism among the traders that 70.00 per cent of traders have undergone training for e- tendering trade and requires still more skills in computer knowledge.

Irene Teresia *et al.* (2017) study sought to characterize farmers' awareness of agricultural extension devolution and analyse factors that influence their awareness. Slightly less than half of the respondents indicated that they were aware of agricultural extension devolution. Factors like Farm size, possession of title deed, education, income, attendance to Farmer field days and age were found to significantly enhance awareness.

Nain *et al.* (2017) research study states that farmer's awareness level regarding the agricultural insurance schemes was found at lowest level in terms of its components and sub components. The farmers were sensitive to different constraints including premium rate, timely returns and assessment procedures.

Renuka (2017) in her study on customer awareness towards online trading examines the trends in the online trading industry, as well as the competing business models of traditional and online brokerage firms. The present study attempts to find out the satisfaction level of online share traders. The primary data was collected from 60 respondents through a well-structured questionnaire. The results say that respondents were aware about online trading and is being preferred by customers rather than offline trading. Major reason for customers to invest in online trading is its conveyance and user friendly.

Kolageri and Banakar (2018) conducted study on awareness of e-tendering and e-trading among the farmers and market functionaries in the agricultural produce market committees (APMCs) of Karnataka. The market functionaries mainly considered were traders, commission agents and market officials. The result obtained observed that the

awareness among the market officials was higher and medium among farmers and other market functionaries. 73.38 per cent of farmers were aware about gate entry in APMCs.

Kolageri and Banakar (2018) revealed in their study titled that cent per cent of traders were aware about e trading and 53.33 per cent of traders knew the differences between e tender and e trade. Cent per cent of traders were aware about assaying laboratory facility in APMC.

2.2Concept and measurement of perception of respondents

Chuleeporn (2006) observed that consumers who had positive experience with online shopping, perceived more benefits on online shopping, and those that perceived that online shopping to be easier are likely to shop online. In contrast, two factors (perceived risk and perceived uncertainty) were rated lower by the online group which indicates that those consumers, online business should make their potential customers aware of the security techniques implemented on their websites. It is also important to make customers feel more certain when shopping online.

John and Chris (2011) conducted a study on stakeholder's perceptions of green marketing and authors found that customer stakeholders perceived greater value (90.00%) when the firm is able to manage successfully and coordinate demand (marketing) and (supply) functions, ensuring that customer stake holders receive what they are promised in regard to environmental products and services.

Chengappa *et.al*. (2012) conducted a study on IT application in agricultural marketing service delivery - electronic tender system in regulated markets. This study focuses on the application of Information Technology (IT) in the form of introduction of e-tender system in the selected regulated agricultural markets of Karnataka. The results of the study reveals that half the sample farmers indicated regulated markets as their sale place and perceive that selling their produce in regulated markets were better and 43.00 per cent made their sales at both regulated and village markets.

Rebecca and Stuart (2012) analyzed online trading and user perceptions of usability and trust and found that eBay is considered (45.00%) by the public to be the place to take part in online auctions, despite the availability of other ways to buy therein. Local retailers, however, are venturing into independent online retailing rather than opening eBay stores. Shoppers make purchase decisions based on several factors and select different purchase methods dependent on personal preferences, need and mood. Reputation on eBay is still a major factor in purchase decisions.

Kuboye and Ogunjobi (2013) studied the e-marketing for Nigerian agricultural products beyond their locality. The study proposes the use of merchant to act as a middle-agent between the farmers and consumers for the marketing system and also explores the use of web application to market farm products which includes tubers, grains, and so on. An interface is provided on the web application to allow the customers select their preferred products to their carts and an invoice will be generated electronically based on the goods selected. Thereafter, a two-way payment is made available; online payment using e-transacts and local payment to the merchant account directly. All these steps would eventually strengthen marketing system in Nigeria.

Shakeel-Ul-Rehman and Selvaraj (2013) studied the perception of farmers towards regulated agricultural markets in Salem district of Tamilnadu. The findings of the study revealed that majority of the respondents feel a positive perception towards working of regulated markets in Salem district, but there still seems inadequacy of infrastructural facilities in these markets. The farmers are not fully satisfied with price stability in the markets, reasonable rates of produce in the market, reasonable methods of sale, price awareness and grievance redressed mechanism, transport facilities provided by the markets, internal road facilities and parking facility in the markets.

Samson *et al.*, (2014) conducted a study on use of mobile phone technology in Mwanza, Dedza and Mzimba Districts of Malawi. The study assessed drivers of adoption of mobile phone technology and perception of mobile technology for agricultural marketing by smallholder farmers. A regression technique was used to identify drivers and extent of mobile phone use and reported that use is positively affected by literacy,

distance to local market, land size, current value of assets, crop income, and regional variations but negatively influenced by access to electricity. Intensity of use is conditioned by gender, participation in agricultural projects, ownership of a mobile phone, current asset value, distance to nearest public phone services, and region variation.

Girish (2017) in his study entitled a study of e-tendering system and its impact on arrivals and prices of Bengal gram in Karnataka revealed that about 30 to 40 per cent of respondents who are already involved in e-tendering system trade perceived that software is user friendly. Many traders perceived transparency in tender declaration and availability of adequate price information under e-tendering system. Traders also perceived that e-tendering trade would alter the traditional link between farmer and commission agents.

Singh *et al.,* (2017) from their study on impact of market reforms on agricultural growth in Uttar Pradesh reported that majority of the farmers (92 per cent) were found highly dissatisfied and more than 96 per cent farmers claimed that practices followed by traders under present marketing system were exploitative and prices were not transparent. Farmers were found satisfied with the payment system, weighing, auction platform. It was concluded that the farmers were highly dissatisfied with the present agricultural marketing system and suggested that state government should amend its APMC act in order to improve competiveness in the market.

Pavithra *et. al.,* (2018) in their study titled Innovations in agricultural marketing: a case study of e-tendering system in Karnataka, India, reveals that, cent per cent of traders perceived that trade time has been reduced, 94.12 per cent of traders perceived that adequate training is provided regarding e trading and e trading software is user friendly (91.18%).

Pavithra and Nayak (2018) in their study Benefits and Perception of Dry Chilli Farmers in Online Marketing: Experiences from Karnataka State, India. This study attempts to assess the benefits and perception of farmers in online marketing of dry chilli in Hubballi and Byadgi regulated markets, about 60 online dry chilli farmers and 60

traditional farmers were selected. The facilities like lot entry, adequacy and time price information, wider market area, better price and SMS alert were adequate in online marketing with per cent share of 81.60, 73.33, 73.33, 65.00 and 63.30, respectively. Other facilities like gate entry, storage, computers, e-payment were partially adequate with an account of 76.66 per cent, 48.33 per cent, 61.66 per cent, 48.33 per cent, respectively. Farmers had better perception about online trading.

2.3 Concept and measurement of extent of utilization of infrastructures by respondents

Barman and Namita Devi (2004) in their study titled "Infrastructure of Agricultural Marketing: A Study of Three Regulated Markets in Assam", revealed that, despite the non-availability of required infrastructure, most (65.00%) of the farmers of Assam used to sell their produce in traditional "hatts" or weekly bazaar instead of carrying their products to the regulated markets. The organized traders in the present system of agricultural marketing exploited the weak and unorganized peasant class. The infrastructure facilities required for efficient working of regulated markets are lacking and hence the market regulation in Assam has failed to eradicate market imperfections, especially in the food grains marketing.

Pant *et. al.,* (2004) studied the utilization of infrastructural facilities of a primary regulated market in Nagaur district. Kurchamancity primary regulated market was purposively selected for this study. The study revealed that the utilization of physical facilities such as shops, auction platforms, bank, communication facilities and post office, market committee office, etc. by the traders was poor (65.00%) in some cases and moderate in others. The existing godowns facility was cent per cent fully utilized but considered inadequate. Rural warehouse was not utilized by any agency, which shows poor management of market committee. There was no proper canteen facility, and toilets, urinals and bathrooms were not cleaned clearly.

Agwu *et al.* (2008) in their study on 'Use of Information Communication Technologies (ICTs) among Researchers, Extension Workers and Farmers in Abia and

Enugu States: Implications for a National Agricultural Extension Policy on ICTs', reported that internet, television set, voltage stabilizer, radio set, printer, flash drive, diskette, computers, UPS, mobile phone and e-mail were frequently used by all researchers, extension workers and farmers.

Chahal and Kataria (2008) examined the impact of various infrastructural facilities and incentives on trade in regulated markets of Punjab. The study was conducted in three districts, namely Jalandhar, Patiala and Sangrur, which were selected randomly. The primary data relating to various incentives such as credit facility, supply of inputs, timely payments, premium for quality, remunerative prices, free consultancy, etc. were collected. The results showed that there has been a marked change in all the parameters affecting the volume of trade in the regulated markets. The correlation between regulated markets for wheat and paddy was estimated to 0.647 and 0.645, respectively and was significant statistically. The study concluded that the various infrastructural facilities and incentives provided to the producer-sellers affect the trade in the regulated markets which is clearly evident from the increasing volume of market arrivals in the state.

Anita Dagar *et. al*. (2011) viewed that efficient regulated agricultural marketing system helps in optimization of resource use, output management, increase in farm incomes, widening of markets, growth of agro-based industry, addition to national income through value addition and employment creation. An attempt has been made to examine the availability of physical infrastructure facilities in regulated markets in Sirsa district of Haryana. The study reported that the condition of the infrastructure facilities in the selected mandi yard is not very good (48.00%). The physical infrastructure facilities are available to a very small number (23.00%) of the farmers as well as they are not in good condition.

Marc and Kristi (2012) in their study stated that electronic trading systems should be regarded as indispensable building blocks of the infrastructure of financial markets, as trading volume is projected to increase (2.00%) in the future. There is an expectation that the market will have more diverse market participants trading larger and larger volumes

at an increasing speed. Therefore, it is essential to develop integrated electronic systems that process not only trading but also back and middle office operations, such as trade confirmation, settlement, and risk management. Electronic trading is expected to develop further, reflecting these market forces.

Amrutha *et. al.,* (2014) conducted a study in north eastern Karnataka regions to identify and assess the extent of use of electronics and communication technologies (ECTs) in marketing of agricultural commodities and also to investigate the nature and extent of economic benefits by use of ECTs to farmers and other stakeholders in marketing of agricultural commodities. The findings of the study revealed that, the use of electronic balance/ scale has been made compulsory and hence cent per cent were aware of the system of weighment through the e-balance. Further, though many electronics were used in the traditional markets, very few farmers (15.00%) were aware of the electronic display and none of the farmers was aware of e-payment facility which did not exist in traditional markets of Sindhanur and Gangavathi. Hardly any farmers were utilizing the facility of electronic display to make marketing decisions in Raichur market (23.33 %) when compared to Gulbarga market (76.67 %) as these electronic display boards were placed in the APMC office premises. According to the opinion of farmers, electronics devices did not have any impact on the expenditure that was made by farmers in terms of marketing costs and there was no effect on the price mechanism or realization of better price by farmers, but there was reduction in the time that the farmers spent in the market to the extent of one to two hours.

Lakshmi and Debashish (2015) conducted a study on Agricultural Marketing Information System- A case study of traders in Meghalaya reveals that 85.00 per cent of traders utilize Agricultural Marketing Information System for purchase decisions, followed by 80.00 and 75.00 per cent to decide the quantity of the produce to be purchased and quantity of the produce to be stored, respectively.

Ramesh *et al.* (2015) opined that the regulatory marketing structure provides physical facilities and an institutional environment to farmers, traders, processors and other market functionaries to conduct their trading activities and thereby offering best

prices to producer-sellers. In this connection, the role of Agricultural Produce Marketing Committee (APMC) is pivotal in promoting agricultural marketing.

Dileep Kumar (2016) reported that with the inception of Unified Market Platform trade, the arrivals had almost doubled in Tiptur and Chamarajanagara districts. Increase in market competition, transparency in tender declaration and updated information about the prices were the advantages to the stakeholders under UMP.

2.4 Personal, socio psychological and communicational characteristics of respondents

2.4.1 Age

Anandaraja (2002) reported in his study on Developing farmers' friendly interactive multimedia compact disc and testing its effectiveness in transfer of farm technology that the age is an important factor as it reveals the mental maturity of an individual to take decisions for achieving his needs. In his study, nearly two-fifth (39.40%) of the farmers were between 34 and 43 years of age, followed by 27.30 per cent with the class intervals of 24 – 33 years. One-fourth (25.30%) of them belonged to the age category of 44 - 53 years. Least per cent (8.00%) of the farmers were of the age between 54 and 63 years. This leads us to understand that most of the respondents (92.00%) selected for this study belonged to the age between 24 and 53 years.

Sinja *et. al.,* (2006) Studied Milk market access for smallholders: A case of informal milk trader groups in Kenya, the results states that 35 years is the mean age of milk traders.

Shankarairah and Narayana Swamy (2012) revealed that, more than half of farmers belonged to middle age group (52.50%). The probable reason is most of the old people were not interested to use mobile phone and middle age farmers were enthusiastic to use mobile phones for getting information related to agriculture.

Avinash (2013) reported that more than half of the farmers (55.83%) were belonging to middle age category followed by old age (32.50%) and young age (11.60 %) category.

Shuwa *et al.* (2014) in her study showed that, 36.00 per cent of the respondents are between the ages of 31-40 years, 31.00 per cent of them are of between 20-30 years and 26.00 per cent and 7.00 per cent of the respondents are between 41-50 years and above 50 years of age, respectively.

Lakshmi and Debashish (2015) conducted a study on Agricultural Marketing Information System- A case study of traders in Meghalaya stated that 50.00 per cent of traders were middle aged, followed by 35.00 per cent of young aged traders.

Fahad Aldosari and Mehmood Ali Noor (2017) revealed that, utilization of mobile phones by farmers to get agricultural information found to be 34.40 per cent and 33.3%0 per cent with the age group of 25-35 and 36-45 years, respectively. Only 10.90% farmers were below 25 years and 21.30 per cent respondents were above 45 years.

Pavithra and Nayak (2018) in their study entitled Benefits and Perception of Dry Chilli Farmers in Online Marketing: Experiences from Karnataka state, India, revealed that 56.66 per cent of farmers participated in online marketing were middle aged, followed by young age (30.00%).

Subhash (2018) stated in his study that majority of farmers belonged to middle age group i.e. between 34-51 years of age. This age group constituted 59.44 per cent of the total sample. Further, 22.78 per cent and 17.78 per cent farmers were from old and young age groups, respectively.

2.4.2Education

Riyajuddin (2005) in his study observed that, 32.00 per cent online services users were illiterate while 68.00 per cent were literates out of which 16.00 per cent possessed graduation and above qualification.

Sinja *et. al.* (2006) Studied Milk market access for smallholders: A case of informal milk trader groups in Kenya, the study reveals that 48.00 per cent of milk traders had secondary level of education followed by, 38.20 per cent primary level educated traders.

Meera *et al.* (2010) conducted a study on 'Critical analysis of e-learning opportunities and e-readiness in the public extension system: Empirical evidence from Tamil Nadu', and reported that majority (63.00%) of the respondents had a Master's Degree in agriculture as their educational qualification

Avinash (2013) observed that 21.66 per cent of the farmers had studied up to primary level, followed by 14.16 and 20.83 per cent of them had studied up to middle school and high school education, respectively. Whereas, 18.33 per cent of them had studied up to pre-university and the remaining 11.66 per cent of them had studied up to graduation. Illiterates comprised of 13.33 per cent of the farmers.

Gowda Govinda *et al.* (2015) study reveals that, 28.31 per cent of the respondents had 'high school' education followed by 'college education' (17.75%) and 'primary' school (17.08 %) and 'illiterates' were noticed to the extent of 15.28 per cent, followed by 'graduate' level education (14.60%) and 'Middle' school (6.98%).

Lakshmi and Debashish (2015) study reveals that 37.50 per cent of agricultural traders had high school level of education, followed by 20.00 per cent had pre university level of education. These traders were analysed to measure their awareness towards Agricultural Marketing Information System (AMIS)

Fahad Aldosari and Mehmood Ali Noor (2017) revealed that, 14.80% respondents were illiterate, 23.00 per cent and 23.50 per cent were with primary and middle education, respectively. Only 20.20 per cent were with the secondary school education, and 18.60 per cent of the respondents were with a higher secondary education. The overall literacy rate of the study area was quite encouraging.

Rupendra Kumar *et al*. (2017) revealed that, more than 50.00 per cent ICT users were graduate and above while, it was 24.00 per cent and 26.00 per cent up to higher secondary and intermediate, respectively.

Hehlangki Tyngkan (2018) study reveals that, 30.40 per cent of farmers coming to Nawapara APMC had education level up to secondary education 17.04 per cent of Dhamtari farmers were had an education level up to Pre University.

Pavitrhra and Nayak (2018) in their study entitled Benefits and Perception of Dry Chilli Farmers in Online Marketing: Experiences from Karnataka state, India, revealed that 26.66 per cent of farmers had an education level of pre university followed by 25.00 per cent were educated up to graduation were participate in online marketing.

2.4.3 Family size

Sharma (2006) reported that nearly half of the farmers (49.17%) had medium size family, whereas 29.17 and 21.67 per cent of the respondents had small and large family size, respectively.

Chandravadiya (2009) revealed that 48.00 per cent of the women self help group members had medium size of family, whereas 38.00 and 14.00 per cent of the respondents had small and large family size, respectively

Swagatika (2011) observed that one-fourth of the farmers (25.00%) had family size up to 4 members, 4. 5 per cent of the farmers had family size of 5 to 6 members, 15 per cent of the farmers had family size of 7 to 10 members and the remaining ten per cent of the farmers had family size of more than 10 members.

Priyanka (2014) found that two-third (68.90%) of the farmers were having small family (up to 5 members), whereas 31.10 per cent of the respondents were having large family (above 5 members).

Lopamudra (2016) revealed that majority of the farmers (79.00%) had family size of above four members and the remaining number of farmers (21.00%) had family size up to 4 members.

2.4.4 Land holding

Suresh (2004) noted that, 68.75 per cent of the respondents were having medium size of land holding followed by large (19.17 %) and small (12.08 %) size of land holding.

Nagesh (2006) revealed that, more than three-fifth (66.66 %) of pomegranate growers belonged to medium farmer category. Whereas, 24.17 per cent and 09.17 per cent of the respondents fell under semi-medium and big farmer's category, respectively.

Shanthamani (2007) found out that 38.00 per cent of the farmers interviewed were belonging to medium landholding category followed by, small (31.30%), large (20.70%) and marginal (10.00%) farmers categories.

Lopamudra (2016) revealed that majority (70.83%) of farmers interviewed were marginal farmers, while 23.33 and 5.83 per cent of the farmers interviewed were small and big farmers, respectively.

Hehlangki Tyngkan (2018) study reveals that, 58.67 per cent of Nawapara farmers were the small land holders and 48.00 per cent of Dhamtari farmers were having small land holding.

Pavithra and Nayak (2018) in their study entitled Benefits and Perception of Dry Chilli Farmers in Online Marketing: Experiences from Karnataka state, India, revealed 50.00 per cent of farmers who participated in online marketing were having medium level of land holding.

2.4.5 Farming experience

Sahana (2003) reported that 40.00 per cent of the farmers had moderate farming experience, while 33.00 and 27.00 per cent of the respondents had less and high farming experience, respectively.

Sivanarayana *et.al.,* (2008) found that more than half of the farmers (58.33%) belonged to medium farming experience category, followed by 21.67 and 20.00 per cent belonging to high and low farming experience categories, respectively.

Uday Kumar (2010) revealed that 45.88 per cent of the farmers were having more farming experience followed by moderate (42.35%) and low (11.77%) farming experience, respectively.

Kumar (2009) in his study specified that majority (58.67%) of the respondents had medium farming experience (10 to 20 years), while (30.66%) of the respondents had high farming experience (more than 20 years) and 10.66 per cent of respondents had low farming experience.

2.4.6 Marketing experience

Hehlangki Tyngkan (2018) reveals that, 41.33 per cent of farmers had marketing experience more than 5 years in Nawaparar district and 46.67 per cent of farmers had less than 5 years of marketing experience in Dhamtari district of Chattisgarh.

2.4.7 Distance from APMC to home

Sixty per cent of the farmers expressed that their villages were far way (8-10 km) from Raitha Samparka Kendras (Sahana, 2003).

Majority of the farmers (78.00%) expressed that the agricultural inputs agencies are located far from the villages and it is difficult to reach far off places due to lack of transportation facilities (Narayanaswamy, 2005).

Almost all the farmers (99.00%) felt that the Grameena banks are far away from their villages and it is difficult to reach the banks in rural areas (Sivanarayana *et.al.,*2008)

Majority of the farmers (75.00%) expressed that villages were far away from Raitha Samparka Kendras and the other 25.00 per cent of the farmers expressed that their villages are nearer to Raitha Samparka Kendras (Avinash, 2013).

Pavitrhra *et.al.,*(2018) mentioned that the mean distance between village to the APMC yard is 22.54km in Gulbarga district. And it is 10.35km and 6.00 km in Chittapur and Sedam APMCs.

2.4.8 Risk orientation

Monica (2011) reported that 53.33 per cent of the farmers prefer to take risk, 42.22 per cent of them prefer to take risk moderately, and only 4.45 per cent were able to take high risk in agriculture.

Lakshmi (2012) revealed that 54.81 per cent of the farmers prefer to take risks, while 32.69 per cent of them prefer to take risk moderately and 12.50 per cent were able to take high risk in agriculture.

Naveenkumar (2012) pointed out that, more than half (51.67 %) of the respondents had medium risk orientation followed by 25.00 and 23.33 per cent of them were having high and low risk orientation, respectively.

Sunitha (2012) reported that 41.60 per cent of the farmers belonged to high risk orientation category, whereas 31.70 and 26.70 per cent of the respondents belong to medium and low level of risk orientation, respectively.

Parmar (2014) observed that 60.50 per cent of the farmers had medium level of risk orientation followed by high (23.50%) and low (16.00%) level of risk orientation.

Sharma *et al.* (2014) indicated that, more than two-fifth (46.67 %) of the potato growers possessed medium level of risk and uncertainty of production pattern. Whereas, 27.78 per cent of them got high level of risk and uncertainty of production pattern and only 25.56 per cent of them got low level of risk and uncertainty of production pattern.

2.4.9 Marketing orientation

Yadav (2001) revealed that more than three fourth (78.33%) of the farmers had high level of management orientation and the other 21.67 per cent of the farmers had low level of management orientation

Almost an equal distribution of self-help group members observed in low (36.00%), medium (30.0%) and high (34.00%) level of management orientation (Narayanaswamy, 2005).

Lavanya (2010) reported that two-third (66.70%) of the farmers had medium level of management orientation; while 18.30 per cent had low and 15.00 per cent had high level of management orientation.

Sunil (2014) reported that 77.91 per cent of the farmers had medium level of management orientation, while 21.25 and 0.84 per cent of them belonged to low and high level of management orientation category, respectively

Asha (2015) revealed that 47.50 per cent of the farmers had medium level of management orientation followed by low (29.17%) and high (23.33%) level of management orientation

2.4.10 Innovative proneness

Shanthamani (2007) reported that 46.00 per cent of the farmers belonged to medium innovativeness category, followed by high (29.3%) and low (24.7%) innovativeness category.

Naveenkumar (2012) studied that, less than half of the respondents (45.83 %) belonged to medium innovativeness category. However, 28.34 per cent of them fell under high category of innovativeness and 25.83 per cent were in low innovativeness category.

Parmar (2014) revealed that 42.50 per cent of the farmers had high level of innovativeness, followed by 35.30 and 22.00 per cent of the respondents were having medium and low level innovativeness, respectively.

Pooja Patel *et al.* (2014) noticed that, more than three-fifth (61.25 %) of the dairy farmers were found to have medium level of innovativeness. Whereas, 23.75 per cent go high and 15.00 per cent of them had low level of innovativeness.

Chhodavadia (2016) revealed that majority of the farmers (54.50%) belong to medium innovativeness group, while 39.50 and six per cent of the respondents were belonging to low and high level of innovativeness, respectively

Rajput (2016) revealed that 54.38 per cent of the farmers had medium level of innovativeness, whereas 24.37 and 21.25 per cent of them had high and low level of innovativeness, respectively.

2.4.11 Information seeking behaviour

Ulrich Kleih *et.al.,* (2004) in their study on Farmers and Traders sources of Market information in Lira district Uganda reveals that, main source of information for traders in Lira district was radio (75.00%), other traders (73.20%) followed by, family/ neighbours (71.40%).

Suresh (2004) found that, more number of the dairy entrepreneurs had medium level of information seeking behaviour, followed by high and low level with 68.75, 17.08 and 14.17 per cent, respectively.

Vijaykumar (2011) revealed that, nearly two-fifth (37.50 %) of silkworm seed producers' possessed low information seeking behaviour, followed by medium (31.67 %) and high (30.83 %) level of information seeking behaviour.

Pooja Patel *et al.* (2014) concluded that, nearly three-fourth of the dairy farmers (73.75%) were found to possess medium information seeking behaviour followed by low (13.75 %) and high (12.5 %) information seeking behaviour.

Sharma *et al.* (2014) identified that, great majority (93.33 %) of the respondents had medium level of utilization of information sources (0.82-2.04), followed by high level (06.67) of information sources (> 2.05). Whereas, none of them had low level of utilization of information sources.

Lakshmi and Debashish (2015) stated in their study that major source of information for traders is contacts in other market (96.00%), followed by fellow traders (90.00%) and newspaper (68.00%).

2.4.12 Achievement motivation

Devalatha (2005) reported that 65.83 per cent of the farmers belonged to medium level of achievement orientation, whereas, 17.50 and 16.67 per cent of them belonged to high and low level of achievement orientation categories, respectively.

Narayanaswamy (2005) revealed that 42.00 per cent of self help group members had medium level of achievement orientation, while 34.00 per cent of them had low level of achievement orientation and the remaining 24.00 per cent of the respondents had high level of achievement orientation.

Gopala (2010) reported that less than half of the farmers (46.67%) belonged to high level of achievement orientation category, whereas 33.33 and 20.00 per cent of them belonged to low and medium level of achievement orientation categories, respectively.

Sangappa (2012) revealed that 40.00 per cent of the farmers had high achievement orientation followed by low (37.78%) and medium (22.22%) level of achievement orientation.

Asha (2015) observed that 41.67 per cent of the farmers had medium level of achievement orientation followed by low (32.50%) and high (25.83%) level of achievement orientation.

Trading experience

Lakshmi and Debashish (2015) study reveals that 57.50 per cent of traders had more than 10 years of experience in agricultural produce marketing, followed by 30.00 per cent of traders had 11 to 20 years of trading experience in agriculture.

Pavithra *et. al.,* (2018) in their study titled Innovations in agricultural marketing: a case study of e-tendering system in Karnataka, India, reveals that, mean trading experience of traders of Gulbarga was 8.74 years. Traders of Chittapur and Sedam have trading experience of 18.87 and 11.79 years, respectively.

2.4.13 Price pattern

Nahatkar, *et.al.,*(1998) examined the nature and magnitude of price fluctuations of cotton in Kukshi Regulated Market, considering secondary time-series data for a period of 11 years from 1986-87 to 1996-97. The analysis of the data shows that seasonal index of cotton prices was minimum (96.45 per cent) in the second quarter (January-March) and maximum (106.73 per cent) during the third quarter (April-June). The range of difference between the two was 10.28 per cent, clearly indicating high seasonal fluctuation of cotton prices.

Ravi Kumar *et.al.,* (2001) in their paper titled "Trends in Arrivals and Prices of Selected Commodities in Anakapalle Regulated Market'' reported that in general, arrivals showed mixed trend, whereas prices showed an increasing trend for the selected commodities in Anakapalle regulated market of Andhra Pradesh. There exists an inverse relationship between seasonal indices of arrivals and prices of selected commodities.

Jyothi (2011) conducted the study on role of NCDEX spot exchange ltd. (NSPOT) in tur marketing in Gulbarga district. The study reported that tur growers were

able to receive a net price of Rs.3562.02 per quintal, which was more by Rs.350 and Rs.360 in comparison with net price received from APMC sales and Tur Board sales respectively. The total marketing cost in NSPOT was less (Rs.139.44 per quintal) compared to the total marketing cost in APMC (Rs.264.75 per quintal) and Tur Board (Rs.198.67 per quintal).

Girish (2017) in his study entitled by, a study of e-tendering system and its impact on arrivals and prices of Bengal gram in Karnataka revealed that the prices of Bengal gram in Gulbarga market have shown the increasing trend. The prices have decreased during the peak arrival season in the Bengal gram. During the months other than January, February, march and may there was hike in the prices for the Bengal gram. During the months of January, February, March and May there was reduction in the price due to the high arrivals than the normal months. It is following the inverse relationship between arrivals and price. It was found significant that there is a significant difference between price trend between pre and post introduction of e-tendering system of Bengal gram in Gulbarga market of Karnataka. Paired t test has been used at 5% level of significance where t calculated value (19.84) which is greater than the t table value (2.20) with mean 3.51 and SED 0.17 and hence the e-tendering system is more healthy practice than manual tendering system of marketing. Due to increased transparency in prices of commodities the farmers have started the bringing the produce to the APMC yard for marketing which in turn has increased the arrivals in the market.

Hehlangki Tyngkan (2018) reveals that a relative change of 9.24 per cent of paddy price is increased after the introduction of e NAM in Nawapara APMC and 14.51 per cent of price of paddy is realized in Dhamtari APMC of Chattisgarh.

Pavithra and Nayak (2018) provides evidence that, he online market price of green gram was 9.52 per cent more than the traditional market price in Hubballi market. About 2.39 per cent more in Naragund market, 9.09 per cent more in Ron market, 4.44 per cent more in Laxmeshwar market and 6.00 per cent more in Gadag market, respectively. The online market price of dry chilli was 8.50 per cent more than traditional market price in Hubballi.

2.5 Relationship between profile and awareness level, perception and extent of utilization of infrastructures by respondents

2.5.1 Relationship between profile and awareness level

Kumar *et al.* (1987) identified factors influencing buying decision making of 200 respondents for various food product. Awareness about product's country of origin and brand of the products was cross tabulated against age, gender and income. Results revealed that the considered factors were independent of age, education and income. The brand image seemed to be more important than the origin of the product, since the consumers were attracted to the brands.

Sinja *et. al.,* (2006) reveals that education level of milk traders have positive significant relationship with awareness about joining the informal milk traders unions.

Irene Teresia *et al.* (2017) study sought to characterize farmers' awareness of agricultural extension devolution and analyze factors that influence their awareness. Slightly less than half of the respondents indicated that they were aware of agricultural extension devolution. Factors like Farm size, possession of title deed, education, income, attendance to Farmer field days and age were found to significantly enhance awareness.

2.5.2 Relationship between profile and extent of utilization of infrastructures

Kashem (2010) revealed that, attitude towards technology of the mobile phone user farmers had significant positive relationship with their use of mobile phones in receiving agricultural information from the input dealers.

Ayub (2014) in his study titled, Customer Perception Awareness and Satisfaction towards Online Shopping A study with reference to Chennai city indicates that, there is significant influence of customer's age towards infrastructure in online shopping. Further, the mean table 4.5 indicates that the customers with age 35-45 years have scored higher mean value of 13.51 and the lowest mean was scored by the customers with age 25-35 years of age (12.58). This shows that the customers with age 35-45 years are more

pleased with the infrastructure in online shopping and the customers with age 25-35 years are less pleased with the infrastructure in online shopping.

Ayub (2014) study reveals that, the graduate is more pleased with the infrastructure in online shopping and the customers possessing professional degree are less pleased with the infrastructure in online shopping.

Patel (2015) reported that, the study that few attributes of sample farmers found to significant association with utilization pattern of communication channels.

Raksha *et al.* (2015) revealed a significant association between training received, achievement motivation and innovativeness of extension personnel with their extent of use of ICTs.

Sulaiman Umar *et al.* (2015) revealed that the level of training on ICT, membership in professional associations, educational level and marital status of the extension agents showed a positive correlation with the utilization of ICTs. Age, professional rank and income level were found positive but not significant in influencing the use of ICT by extension personnel.

Priyanka (2017) revealed that, extent of computer usage had positive and significant relationship with profile of students towards computer usage.

2.5.3 Relationship between profile and perception

Chuleeporn (2006) observed that consumers who had positive experience with online shopping, perceived more benefits on online shopping, and those that perceived that online shopping to be easier are likely to shop online. In contrast, two factors (perceived risk and perceived uncertainty) were rated lower by the online group which indicates that those consumers, online business should make their potential customers aware of the security techniques implemented on their websites. It is also important to make customers feel more certain when shopping online.

Oyesola (2007) reported a significant relationship between years of residency and perception of farmers regarding effect of infrastructural facilities on livelihood activities in local government area. It was also reported that sex, marital status, educational status and age of the farmers had non-significant relationship with the perception regarding effect of infrastructural facilities on livelihood activities in local government area.

Pradeep (2012) revealed that extension contact and scientific orientation of grama panchayat members had positive and highly significant correlation, whereas education, social participation, economic motivation, risk orientation, and innovativeness had positive and significant correlation with the perception of grama panchayat members towards farm television.

Subhash (2012) revealed that age, training received, reading habit, land holding, annual income, extension participation, mass media, economic motivation, risk orientation and innovativeness of farmers had significant relationship with their perception toward technical capability of public extension personnel in delivering agricultural extension services.

Avinash (2013) revealed that, annual income, land holding, mass media participation, organizational participation, extension contact, frequency and purpose of visit to Raitha Samparka Kendras, extension participation, cosmopoliteness, scientific orientation and innovative proneness of farmers were positively and significantly associated with the perception about the functioning of Raitha Samparka Kendras.

Madan *et.al* (2017) reported that education, farm size, extension contact, information seeking behavior, information management behavior and innovativeness of farmers were significantly correlated with their perception towards mobile based agro advisories.

Constraints

Krishnamurthy (2000) in his study entitled “Indian Rural Market: Problems and Prospects” examined rural prosperity, growing rural market challenges and career in rural

marketing. He reiterates that delivering a better standard of living and quality of life will be the new role for rural marketing. The study reveals that in the near future, the purchasing power of rural consumers will be much more than their counterpart in urban markets. The author concludes that the rural market is like a goldmine and future marketing in India will be in rural India.

Simpson and Docherty (2004) found several perceived barriers to the adoption of e-commerce in Australian SMEs including costs, lack of e-commerce skills, lack of knowledge, lack of help and lack of time and trust/security issues associated with technology. On the other hand, those firms that were (more) aware that customers look for new services customer preferences for services continually change - increases on average - the odds of adoption.

Amrutha *et. al.,* (2014) electronics devices did not have any impact on the expenditure that was made by farmers in terms of marketing costs and there was no effect on the price mechanism or realization of better price by farmers, but there was reduction in the time that the farmers spent in the market to the extent of one to two hours.

Hehlangki Tyngkan (2018) study reveals that farmers of Nawapara enlisted consumption of more time in e auction, multiple visit to bank for payment and lack of awareness about e NAM as the first three major constraints in operation of e NAM. Farmers of Dhamtari enlisted major problems in operating e NAM were lack of awareness about e NAM (I), time consumption in e auction process (II) and not understanding the entire e trading process and context displayed in the display board and computer screen (III).

Hehlangki Tyngkan (2018) study reveals that major constraints enlisted by eNAM traders were such as difficult in purchase of the agricultural produce without manual checking (I), complexity in eNAM trading (II), and more time consuming in e auction(III).

Suggestions

Chengappa *et.al* (2012), conducted a study on IT application in agricultural marketing service delivery - electronic tender system in regulated markets. There is vast scope to improve market fee collections if gate entry is systematically monitored. Traders, by and large, have accepted the system, but face problems with webpage design. The option to make entries and price alterations for more lots on a single page has been suggested as the number of lots is very large. Provision of infrastructure in terms of access to more computers, kiosks and LAN facility would enhance trader's acceptance level. Creating awareness about the system among farmers has been found necessary, as majority of them are not much aware about the new system. The outsourcing of the process to private players is a right step as the capacity levels of available human resources with the regulated markets are not adequate, as such capacity building is necessary in the long-run.

Shakeel-Ul-Rehman and Selvaraj (2013) study suggests that the government must examine its policies and regulations with view to strengthen the marketing network and ensure that prices are being determined on competitive basis and markets are being manipulated.

Satish G. Athawale (2014) studied about APMC and e-trading for financial inclusiveness in Karnataka. The study focused on Information Technology (IT) in the form of introduction of e-tender, e-mandi, e-trading system in the selected regulated agricultural markets of Karnataka The efficiency of the system can be enhanced if end-to-end IT applications are introduced. Paper basically discuss e-trading process and try to understand and learn system adopted by APMC of Karnataka paper ends with need to implementation of this system all over India.

Hehlangki Tyngkan (2018) study states the major suggestions offered for the betterment of eNAM trading were increasing bidding time, increasing quality of the produce bought for eNAM sale and reduction of market fees to encourage participants to participate more in eNAM trade.

Pavithra and Mahantesh Nayak (2018) study suggests that, infrastructure for post-harvest management needs to be strengthening primary level on public private partnership mode. There is need to create awareness about online marketing through training, campaigns and other extension activities to farmers.

III METHODOLOGY

Methodology explains the specific procedures or techniques used to identify, select, process and analyse information about research topic. It is the description of the typology of methods, empirical measures designed to quantify different variables, development of instrument for data collection and statistical tools employed for analysis. Following headings explains the materials and methods used in this research to achieve the objectives.

3.1 Locale of the study

3.2 Description of study area

3.3 Selection of the respondents

3.4 Research design

3.5 Operationalization and measurement of dependent and independent variables for Farmers

3.6 Operationalization and measurement of dependent and independent variables for Traders

3.7 Measurement of dependent variables for Farmers

3.8 Measurement of dependent variables for Traders

3.9 Measurement of independent variables for Farmers

3.10 Measurement of independent variables for Traders

3.11 Problems encountered by farmers and traders in utilization of services of ReMS

3.12 Suggestions for the effective utilization services of ReMS.

3.13 Collection of data

3.14 Statistical methods used for data collection and analysis

3.15 Conceptual model of the study

3.1. Locale of the study

The present study was carried out in Davanagere and Chamarajanagara districts of which represents Bangalore and Mysore divisions of UMP market divisions of Karnataka, respectively. APMCs of these districts purposively selected as the UMP trade is prevalent and prominent. Where Chamarajanagara APMC is commodity specific market for Turmeric and in Davanagere agricultural produce like paddy, groundnut and areca nut were majorly traded through ReMS. Hence, these APMCs were intentionally selected to get the best results. Fig. 3 shows the locale of the study.

3.2 Description of study area

Davanagere is a city in the centre of the southern Indian state of Karnataka. It is the sixth largest city in the state is at the centre of Karnataka, 14°28' N latitude, 75°59' longitude and 602.5 metres (1,977 ft) above sea level. Davanagere District receives average annual rainfall of 644 mm (25.4 in). As of 2011 census, Davanagere city had a population of 435,125. Males constitute 52 per cent of the population, and females 48 per cent. Davanagere has an average literacy rate of 85 per cent, higher than the national average of 74.04 per cent: male literacy is 89 per cent and, female literacy is 81 per cent. In Davanagere, 12 per cent of the population is under 6 years of age.

Major cultivation of rice and maize takes place in the district. Dry land is available which is suitable for cultivation of fruits and vegetables. Important commodity arrivals in the market are paddy and maize. Whereas paddy constitute for maximum arrival 600 to the minimum of 250 per day. The peak period is noted to be May to July and November to January. Where the maize constitute for second largest commodity marketed in APMC. Which account for maximum of 500 arrivals and minimum of 150 arrivals per day. The peak period of arrival is noted during October to April. 1427 registered traders and 473 commission agents are registered in the market. Annual income of the APMC accounts for 12,04,63,284 rupees (AGMARKNET-2018-19).

Chamarajanagara is the southernmost district in the state of Karnataka in India. According to the 2011 census, Chamarajanagara district has a population of 10,20,962,

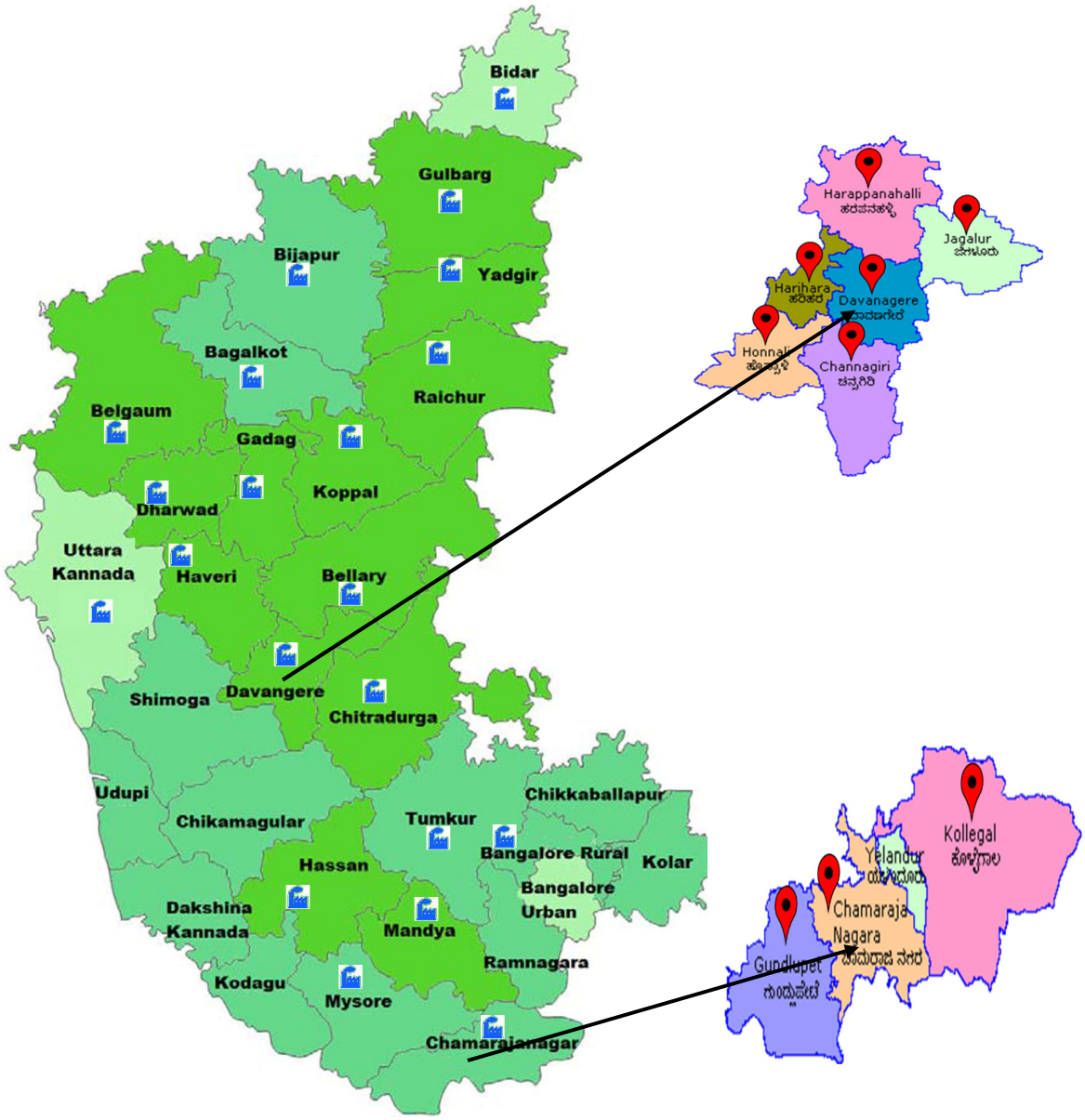


Fig. 3. Figure showing study area

roughly equal to the nation of Cyprus, of which male and female constitute 5,12,231 and 5,08,560, respectively. The district has a population density of 200 inhabitants per square kilometre. The average literacy rate of the district is 61.12 per cent, of which male literacy rate is 67.93 per cent and female literacy is 54.92 per cent.

Major agricultural commodity marketed in the APMC is turmeric and coconut. APMC has 140 and 102 registered traders and commission agents, respectively. It is the commodity specific market for turmeric. Figure 3. Shows the study area.

3.3. Selection of the respondents

A total of 120 respondents, 60 from each district (40 no.s of Farmers, 20 no.s Traders) and total of 40 Non beneficiary farmers, 10 farmers each from paddy, groundnut, Turmeric and areca nut were selected. Primary data will be collected using a pre-tested schedule. Data is collected from paddy, groundnut and areca nut growers of Davanagere district and turmeric farmers of Chamarajanagara district.

3.4. Research design

Ex-post-facto research design is adopted for the study, since the programme is undergoing and in process.

"Ex-post-facto research is the most systematic empirical enquiry in which the researcher does not have control over the independent variable as their manifestation has already occurred or they are inherent and not manipulatable. Thus, inferences about relation among variables were made without direct intervention from concomitant variation of independent and dependent variables (Kerlinger, 1973)".

3.5. Operationalisation and measurement of dependent and independent variables for Farmers

Awareness of farmers about trading practices followed in ReMS, perception of farmers about the functioning of ReMS and extent of utilization of infrastructure created through ReMS were considered as dependent variables in the present investigation.

Thirteen personal, socio-economic, psychological and communication characteristics of farmers were considered as independent variables for the present investigation.

Table 1: Dependent and independent variables selected and their empirical measurements

Sl. No.	Variables	Empirical measurement
A.	**Dependent variables**	
1	Awareness of trading practices	Schedule will be developed
2	Extent of utilization of infrastructure	Schedule will be developed
3	Perception	Procedure followed by Avinash (2013)
B.	**Independent variables**	
1	Age	Chronological age of respondents
2	Education	Procedure followed by Kiran (2007)
3	Family size	Procedure followed by Kenchanagouder (2007)
4	Land holding	Schedule will be developed
5	Farming experience	Schedule will be developed
6	Marketing experience	Schedule will be developed
7	Distance from APMC	Schedule will be developed
8	Risk orientation	Scale developed by Nagaraja (1989) with slight modifications
9	Marketing orientation	Scale developed by Supe (1969) with slight modifications
10	Innovative proneness	Scale developed by Moulik (1965) with slight modifications
11	Information seeking behaviour	Scale developed by Rao (1985) with suitable modifications made and used by Pandeli (2005)
12	Achievement motivation	Procedure followed by Sushma (2007) with slight modifications
13	Price pattern	Schedule will be developed

3.6. Operationalisation and measurement of dependent and independent variables for Traders

Awareness of traders about trading practices followed in ReMS, perception of traders about the functioning of ReMS and extent of utilization of infrastructure created through ReMS were considered as dependent variables in the present investigation. Six personal, socio-economic, psychological and communication characteristics of farmers were considered as independent variables for the present investigation.

Table 2: Dependent and independent variables selected and their empirical measurements

Sl. No.	Variables	Empirical Measurement
A.	**Dependent variables**	
1	Awareness of trading practices	Schedule will be developed
2	Extent of utilization of infrastructure	Schedule will be developed
3.	Perception	Procedure followed by Avinash (2013)
B.	**Independent variables**	
1	Education	Procedure followed by Kiran (2007)
2	Trading experience	Schedule will be developed
3	Risk orientation	Scale developed by Nagaraja (1989) with slight modifications
4	Marketing orientation	Scale developed by Supe (1969) with slight modifications
5	Innovative proneness	Scale developed by Moulik (1965) with slight modifications
6	Information seeking behaviour	Scale developed by Rao (1985) with suitable modifications made and used by Pandeli (2005)

3.7. Measurement of dependent variables for Farmers

Where three dependent variables such as, awareness of farmers about trading practices followed in ReMS, perception of farmers about the functioning of ReMS and Extent of utilization of infrastructure created through ReMS were considered in the present investigation.

3.7.1. Awareness of trading practices followed through ReMS by Farmers

Many trading practices are followed in UMP trading of ReMS. The dependent variable awareness measures about the consciousness of the trading practices followed in ReMS by the farmers. Farmers' awareness about different e-trading practices like gate entry, lot id generation, assaying laboratory, kiosk system, bid management hall, e auction, sale receipt generation, electronic weighment, warehouse based electronic sale, post bidding SMS and orientation centres are measured.

A total of 13 statements were prepared for the study which envelopes the aspects such as objectives, interventions, innovations etc. Each statement has two possible responses namely, 'Aware' and 'Not aware' with the score of '0' and '1', respectively. Minimum and maximum score one could get is '0' and '14'. Total awareness score of the respondents is obtained by adding scores of individual statements. Later, the respondents are categorized in to Low, Medium and High based on the mean and half standard deviation.

Awareness level	**Respondents**		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total Awareness
Low < (Mean- ½ SD)	<5.882	<6.469	<6.161
Medium (Mean± ½ SD)	5.88-7.91	6.46-8.88	6.16-8.41
High> (Mean+½ SD)	>7.917	>8.880	>8.413
Mean	6.90	7.675	7.287
SD	2.035	2.411	2.251

*SD=Standard deviation

3.7.2 Extent of utilization of infrastructure by Farmers

Extent of utilization of infrastructure is operationalized as the accessibility and frequency of usage of the infrastructures and services created through ReMS by the farmers. 13 statements were framed and farmers were interviewed with the same and their responses were documented for the study. Where the responses were categorized in to3 point continuum as 'fully utilizes', 'partially utilized' and 'not utilized', the scorings of 2, 1, 0 was given, respectively. The maximum score of '26' and a minimum score of '0' was observed. The respondents were categorized in to 3 groups considering mean and standard deviation as a measure of check.

Extent of utilization	**Respondents**		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total extent of utilization
Low< (Mean- ½ SD)	<12.130	<12.746	<12.394
Medium(Mean± ½ SD)	2.36-3.89	12.74-15.95	12.39-15.18
High >(Mean+ ½ SD)	>14.319	>15.953	>15.180
Mean	13.225	14.350	13.787
SD	2.189	3.485	2.786

*SD=Standard deviation

3.7.3 Perception of farmers about functioning of ReMS

Present study details about the perception of farmers about the functioning ReMS based on the interpretation of farmers on: 1. Purpose of using ReMS. 2. Features of ReMS application. 3. Method of payment. 4. Overall performance.

The scale developed by Avinash (2013) was utilized with slight modifications to analyse the perception of farmers about the functioning of e-markets.. The scale consists of 18 statements categorised into four aspects namely, Purpose of using ReMS, Features of ReMS application, method of payment and Overall performance. The responses were sought on a three point continuum scale viz., Agree, Undecided and Disagree and the scores assigned was 'three', 'two' and 'one', respectively. The minimum and maximum

perception score one could get was 18 and 54, respectively. The perception score of a respondent was calculated by adding up the scores obtained by him/her on all 18 items/statements. Based on the total score, the respondents were classified into three categories namely 'poor', 'average' and 'better' perception levels consider mean and half standard deviation as a measure of check.

Perception	**Respondents**		
	Farmers of Davanagere	Farmers of Chamarajanagara	Overall perception
Poor < (Mean- ½ SD)	<28.203	<29.959	<29.066
Average(Mean± ½ SD)	28.20-36.09	29.95-38.69	29.06-47.77
Better> (Mean+ ½ SD)	>36.096	>38.690	>47.770
Mean	32.15	34.325	33.237
SD	7.892	8.730	8.341

*SD=Standard deviation

3.8. Measurement of dependent variables for Traders

Awareness of traders about trading practices followed in ReMS, perception of traders about the functioning of ReMS and Extent of utilization of infrastructure created through ReMS were the three dependent variables considered for the present investigation.

3.8.1. Awareness of trading practices in ReMS by Traders

Trader's awareness about different e-trading practices like gate entry, lot id generation, assaying laboratory, kiosk system, bid management hall, e auction, sale receipt generation, electronic weighment, warehouse based electronic sale, post bidding SMS and orientation centres are measured.

A total of 15 statements were prepared for the study which envelopes the aspects such as objectives, interventions, innovations etc. Each statement has two possible responses namely, 'Aware' and 'Not aware' with the score of '0' and '1', respectively.

Minimum and maximum score one could get is '0' and '14'. Total awareness score of the respondents is obtained by adding scores of individual statements. Later, the respondents are categorized in to low, medium and high based on the mean and half standard deviation.

Awareness level	Respondents		
	Traders of Davanagere	Traders of Chamarajanagara	Total Awareness
Low < (Mean- ½ SD)	<8.285	<12.155	<9.817
Medium (Mean± ½ SD)	8.28-10.31	12.155-13.144	9.817-12.13
High> (Mean+ ½ SD)	>10.314	>13.144	>12.13
Mean	9.30	12.65	10.975
SD	2.028	0.988	2.314

*SD=Standard deviation

3.8.2 Extent of utilization of infrastructure by Traders

Extent of utilization of infrastructure is operationalized as the accessibility and frequency of usage of the infrastructures and services created through ReMS by the Traders. 14 statements were framed and farmers were interviewed with the same and their responses were documented for the study. Where the responses were categorized in to three point continuum as 'fully utilizes', 'partially utilized' and 'not utilized', the scorings of 2, 1, 0 was given, respectively. The maximum score of '26' and a minimum score of '0' was observed. The respondents were categorized in to 3 groups considering mean and standard deviation as a measure of check.

Extent of utilization	Respondents		
	Traders of Davanagere	Traders of Chamarajanagara	Total extent of utilization
Low < (Mean- ½ SD)	<13.432	<16.583	<14.805
Medium (Mean± ½ SD)	13.43-16.46	16.58-17.91	14.80-17.39
High> (Mean+ ½ SD)	>16.467	>17.916	>17.394
Mean	14.95	17.25	16.10
SD	3.034	1.332	2.589

*SD=Standard deviation

3.8.3 Perception of Traders about functioning of ReMS

The scale developed by Avinash (2013) was utilized with slight modifications to analyse the perception of traders about the functioning of e markets. The responses were sought on a three point continuum scale viz., Agree, Undecided and Disagree and the scores assigned was 'three', 'two' and 'one', respectively. The minimum and maximum perception score one could get was 18 and 54 respectively. The perception score of a respondent was calculated by adding up the scores obtained by him/her on all 18 items/statements. Based on the total score, the respondents were classified into three categories namely 'poor', 'better' and 'good' perception levels consider mean and half standard deviation as a measure of check.

Perception	**Respondents**		
	Traders of Davanagere	Traders of Chamarajanagara	Overall perception
Poor< (Mean- ½ SD)	<13.432	<16.583	<14.805
Average(Mean± ½ SD)	13.43-16.46	16.58-17.91	14.80-17.39
Better>(Mean+ ½ SD)	>16.46	>17.916	>17.394
Mean	14.95	17.25	16.10
SD	3.034	1.332	2.589

*SD=Standard deviation

3.9. Measurement of independent variables

Thirteen personal, socio-economic, psychological and communication characteristics of farmers were considered as independent variables for the present investigation.

3.9.1 Age

Chronological age refers to the period that has elapsed beginning with an individual's birth till to the time of investigation. The respondents were categorized as follows.

Age	Category
Upto 35 years	Young
>35 upto 50 years	Middle
>50 years	Old

3.9.2 Education

The number of years of formal education the person has undergone is operationalised as education. The procedure followed by Kiran (2007) is used to quantify the stated age by the respondents. Later the respondents were categorized into different level of education as follows,

Category	Score
Illiterate	0
Primary School	1
Middle School	2
High School	3
PUC	4
Graduation	5

3.9.3. Family size

The respondents were asked to state the number of people residing in their family. The stated numbers were quantified by adopting the procedure followed by Kenchanagouder (2007). The respondents are categorized as follows,

Category	Score
Small family (< 4 members)	1
Medium family (5-7 members)	2
Big family (>7 members)	3

3.9.4. Land holding

It refers to the extent of acres of land possessed by the respondent with respect of wet land, garden land and dry land. According to the Karnataka Land Reforms Act 38 of 1966, one acre of irrigated or garden land was equated to 2.5 acres of dry land. Based on the responses of the respondents they were grouped into different categories.

Category	Criteria
Marginal	upto 2.5 acres
Small	>2.50 upto 5.0 acres
Big	> 5 acres

3.9.5. Farming experience

Respondents were asked to state the number of years of experience in cultivation of crops at the time of investigation. Respondents were classified in to three categories,

Categories	Farming experience (years)
Less	<8
Moderate	8-16
More	>16

3.9.6 Marketing experience

Refers to the number of years of experience the respondents have in trading of agricultural produce at APMC's at the time of investigation. The stated responses are categorized in to three groups such as,

Categories	Respondents		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total marketing experience
Less < (Mean- ½ SD)	<8.572	<8.126	<8.353
Moderate (Mean± ½ SD)	8.572-11.477	8.126-10.973	8.353-11.221
More > (Mean+ ½ SD)	>11.477	>10.973	>11.221
Mean	10.025	9.55	9.787
SD	2.904	2.846	2.867

*SD=Standard deviation

3.9.7. Distance from APMC

It refers to the interval between respondents home to APMC yard. The stated observations are categorized in to four groups as follows,

Category	Number	Per cent
<5km		
5-10km		
10-15km		
>15km		

3.9.8. Risk orientation

It is the degree to which the farmer was oriented towards risks and uncertainty in accepting new ideas and farm innovations. Scale developed by Nagaraja (1989) is used to measure this variable. The scale consists of six statements, where five statements were positive. The respondents were measured on a three point continuum as agree, undecided and disagree by assigning score of 3, 2 and 1, respectively. The scoring of 3, 2 and 1 for positive statements and 1, 2 and 3 for negative statements were assigned. The minimum and maximum score one could get was 8 and 18, respectively. Based on the total score,

the respondents were grouped into three categories by using mean (13.60) and half standard deviation (1.90) as a measure of check.

Categories	Respondents		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total risk orientation
Low < (Mean- ½ SD)	<13.225	<11.705	<12.425
Medium (Mean± ½ SD)	13.22-15.32	11.705-14.39	12.425-14.89
High> (Mean+ ½ SD)	>15.324	>14.394	>14.899
Mean	14.275	13.05	13.6625
SD	2.099	2.688	2.474

*SD=Standard deviation

3.9.9. Marketing orientation

It is the degree to which the respondent is prepared to adopt new marketing practices and market innovations. Scale developed by Supe (1969) was exploited with slight modifications. Out of six statements, statement number two was negative and rest five statements were positive. The response categories were 'Strongly agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly disagree' and the scorings given were 4, 3, 2, 1, 0, respectively. Negative statement follows the reverse scoring system. The scientific orientation of the respondents were calculated by summating the individual responses to six statements. Where mean and half Standard deviation is used as measure of check and the respondents were categorized as follows,

Categories	Respondents		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total marketing orientation
Low < (Mean- ½ SD)	<21.88	<21.094	<21.488
Medium (Mean± ½ SD)	21.88-24.51	21.094-24.105	21.488-24.311
High> (Mean+ ½ SD)	>24.511	>24.105	>24.311
Mean	23.20	22.60	22.90
SD	2.623	3.011	2.822

*SD=Standard deviation

3.9.10. Innovative proneness

Innovative proneness refers to the behavioural patterns of farmers who have interest and desire to seek changes in farming techniques and to introduce such changes into his operations practically and feasibly. Scale developed by Moulik (1965) with slight modifications were used. There were 13 statements with the response category of 'Strongly agree', 'Agree' and Disagree. Scoring procedure follows 3, 2, 1, respectively. The maximum possible score could be 39 and minimum score could be 13. Exploiting Mean and half Standard deviation as measure of check the respondents were categorized as follows,

Categories	**Respondents**		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total innovative proneness
Low < (Mean- ½ SD)	<27.225	<27.996	<27.602
Medium (Mean± ½ SD)	27.225-30.574	27.996-31.753	27.602-31.172
High> (Mean+ ½ SD)	>30.574	>31.753	>31.172
Mean	28.90	29.875	29.387
SD	3.349	3.756	3.570

*SD=Standard deviation

9.11. Information seeking behaviour

It was operationalized as the degree of exposure or frequency of contact of a ReMS farmers to various sources for gaining farm information.

The information seeking behaviour of a farmer was determined with the help of scale developed by Rao (1985) with suitable modifications. The scale contained 14 items and was grouped under three sub heads *viz.* informal sources, formal sources and mass media. The responses or the frequency of their contact with the sources were documented namely frequently, occasionally or rarely and never with the weightages of 2, 1and 0, respectively. The possible range of score could be obtained was from 0 to 32. Based on the total score obtained by the flower growers on information seeking behaviour, they

were classified into three categories, keeping the mean and half standard deviation as check.

Categories	Respondents		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total information seeking behaviour
Low < (Mean- ½ SD)	<20.877	<19.979	<20.415
Medium (Mean± ½ SD)	20.87-24.72	19.979-25.220	20.415-24.984
High> (Mean+ ½ SD)	>24.722	>25.220	>24.984
Mean	22.80	22.60	22.70
SD	3.844	5.241	4.568

*SD=Standard deviation

9.12. Achievement motivation

Achievement motivation is based on reaching success and achieving aspirations. It can affect the way a person performs a task and represent a desire to show competence. The value associated with an individual that drives him to excel in his/ her job and there by attain a sense of personal accomplishment. The present study uses the scale developed by Sushma (2007) with slight modifications. Where the responses are categorised in five point continuum as strongly agree, agree, un decided, dis agree, strongly dis agree with the scoring of 5, 4, 3, 2, 1, respectively. 6 and 36 were the minimum and maximum possible scores. Mean and half standard deviation was considered as measure of check. Based on this criteria respondents were classified as,

Categories	Respondents		
	Farmers of Davanagere	Farmers of Chamarajanagara	Total achievement motivation
Low < (Mean- ½ SD)	<18.140	<17.039	<17.554
Medium (Mean± ½ SD)	18.140-21.809	17.039-20.060	17.554-20.970
High> (Mean+ ½ SD)	>21.809	>20.060	>20.970
Mean	19.975	18.55	19.262
SD	3.668	3.020	3.415

*SD=Standard deviation

3.9.14. Price pattern

A price pattern is a recognizable configuration of price movement. Here price pattern is calculated for ReMS farmers and non-ReMS farmers and respective price difference were calculated. Absolute price differences were calculated for Turmeric, Paddy, Groundnut and Areca nut.

Crops	ReMS price	Non ReMS price	Price differences
Paddy			
Ground nut			
Areca nut			
Turmeric			

3.10. Measurement of independent variables for Traders

Six personal, socio-economic, psychological and communication characteristics of farmers were considered as independent variables for the present investigation.

3.10.1. Education

The years of formal education undergone were quantified to calculate the level of education here. Procedure followed by Kiran (2007) is exploited to categorize the respondents i.e., Traders as follows,

Category	Score
Illiterate	0
Primary School	1
Middle School	2
High School	3
PUC	4
Graduation	5

3.10.2. Trading experience

It is the number of years Trader involved in trading activities of agricultural produce in APMCs till the time of investigation. The stated responses of traders were categorized in to 3 groups such as,

Categories	Trading experience (years)		
	Traders of Davanagere	Traders of Chamarajanagara	Total trading experience
Less < (Mean- ½ SD)	<15.301	<8.563	<11.454
Moderate (Mean± ½ SD)	15.30-20.19	8.56-13.73	11.45-17.44
More > (Mean+ ½ SD)	>20.198	>13.736	>17.445
Mean	17.75	11.15	14.45
SD	4.897	5.173	5.991

*SD=Standard deviation

3.10.3. Risk orientation

It is the degree to which the trader was oriented towards risks and uncertainty in accepting trade innovations and usage of modern information and communication tools. Scale developed by Nagaraja (1989) is used to measure this variable. The scale consists of six statements, where five statements were positive. The respondents were measured on a three point continuum as agree, undecided and disagree by assigning score of 3,2 and 1, respectively. The scoring of 3, 2 and 1 for positive statements and 1, 2 and 3 for negative statements were assigned. The minimum and maximum score one could get was 8 and 18, respectively. Based on the total score, the respondents were grouped into three categories by using mean and half standard deviation as a measure of check.

Categories	Respondents		
	Traders of Davanagere	**Traders of Chamarajanagara**	**Total Risk orientation**
Low < (Mean- ½ SD)	<14.027	<12.859	<13.416
Medium (Mean± ½ SD)	14.02-15.77	12.85-14.84	13.41-15.33
High> (Mean+ ½ SD)	>15.772	>14.840	>15.333
Mean	14.90	13.85	14.375
SD	1.744	1.980	1.917

*SD=Standard deviation

3.10.4. Marketing orientation

It is the degree to which the respondent is prepared to adopt new marketing practices and market innovations. Scale developed by Supe (1969) was exploited with slight modifications. Out of six statements, statement number two was negative and rest five statements were positive. The response categories were 'Strongly agree', 'Agree', 'Undecided', 'Disagree' and 'Strongly disagree' and the scorings given were 4, 3, 2, 1,0,respectively. Negative statement follows the reverse scoring system. The scientific orientation of the respondents were calculated by summating the individual responses to six statements. Where mean and half Standard deviation is used as measure of check and the respondents were categorized as follows,

Categories	Respondents		
	Traders of Davanagere	Traders of Chamarajanagara	Total marketing orientation
Low < (Mean- ½ SD)	<22.717	<19.905	<21.167
Medium (Mean± ½ SD)	22.71-25.38	19.905-22.794	21.167-24.23
High> (Mean+ ½ SD)	>25.382	>22.794	>24.23
Mean	24.05	21.35	22.70
SD	2.665	2.888	3.065

*SD=Standard deviation

3.10.5. Information seeking behaviour

It was operationalized as the degree of exposure or frequency of contact of a ReMS traders to various sources for gaining farm information.

The information seeking behaviour of a trader was determined with the help of scale developed by Rao (1985) with suitable modifications. The scale contained 14 items and was grouped under three sub heads *viz.* informal sources, formal sources and mass media. The responses or the frequency of their contact with the sources were documented namely frequently, occasionally or rarely and never with the weightages of 2, 1and 0, respectively. The possible range of score could be obtained was from 0 to 32. Based on the total score obtained by the flower growers on information seeking behaviour, they were classified into three categories, keeping the mean and half standard deviation as check.

Categories	**Respondents**		
	Traders of Davanagere	Traders of Chamarajanagara	Total information seeking behaviour
Low < (Mean- ½ SD)	<16.898	<22.353	<18.777
Medium (Mean± ½ SD)	16.89-19.30	22.353-28.846	18.77-24.92
High> (Mean+ ½ SD)	>19.301	>28.846	>24.922
Mean	18.10	25.60	21.85
SD	2.403	6.492	6.145876249

*SD=Standard deviation

3.10.6. Innovative proneness

Innovative proneness refers to the behavioural patterns of traders who have interest and desire to seek changes in trading process and to introduce such changes into his operations practically and feasibly. Scale developed by Moulik (1965) with slight modifications were used. There were 13 statements with the response category of 'Strongly agree', 'Agree' and Disagree. Scoring procedure follows 3, 2, 1, respectively. The maximum possible score could be 39 and minimum score could be 13. Exploiting

Mean and half Standard deviation as measure of check the respondents were categorized as follows,

Categories	Respondents		
	Traders of Davanagere	Traders of Chamarajanagara	Total innovative proneness
Less	<27.547	<26.221	<26.866
Moderate	27.54-31.35	26.22-29.67	26.86-30.53
More	>31.352	>29.678	>30.533
Mean	29.45	27.95	28.7
SD	3.804	3.456	3.666

*SD=Standard deviation

3.11. Problems encountered by farmers and traders in utilization of services of ReMS

The farmers and traders were asked to rank the pre mentioned problems according to the severity and importance of problems to be addressed quickly.

3.12. Suggestions for the effective utilization services of ReMS.

The suggestions of respondents were documented to overcome the problems in using the ReMS application and expressed as frequency and percentage.

3.13. Collection of data

Researcher developed pre tested schedules for farmers as well as traders, in line with the objectives of the study. Personally collected the data from the respondents of Davanagere and Chamarajanagara district by having interaction with them. Purpose of the study and collection of data explained to the respondents prior to the data collection.

3.14. Statistical methods used for data collection and analysis

'A structured schedule was prepared with the help of experts and the data were collected by administering the pre tested structured interview schedule to the selected respondents. The respondents were personally interviewed which enabled the investigator to get the first hand information. Friendly atmosphere was maintained during the interviews to see that the respondents were at ease and expressed their opinion freely and frankly. The data so collected were recorded directly on the schedule. The data collection was done during the month of March, 2019. The data was analysed systematically to draw valid inferences. The statistical tools and tests such as frequency, percentage, mean, standard deviation and correlation coefficient were used wherever found appropriate.'

(i) Frequency

A simple frequency distribution was used to identify the number of ReMS farmers in Davanagere and Chamarajanagara APMCs.

(ii) Percentage

Percentage was used to make the simple comparison of different groups.

(iii) Mean and Standard Deviation

Mean and standard Deviation were computed to classify the respondents into different categories

(iv) Correlation test

Simple correlation test was used to find out the nature of relationship between independent variables and dependent variables.

3.15. Conceptual model of the study

The relationship between independent variables (personal, socio-economic, psychological and communication characteristics of respondents) and dependent

variables are presented in Fig. 4 and Fig. 5. The relationship between independent variables and dependent variables for farmers is presented in Fig. 4, whereas the relationship between independent variables and dependent variables for traders is presented in Fig. 5.

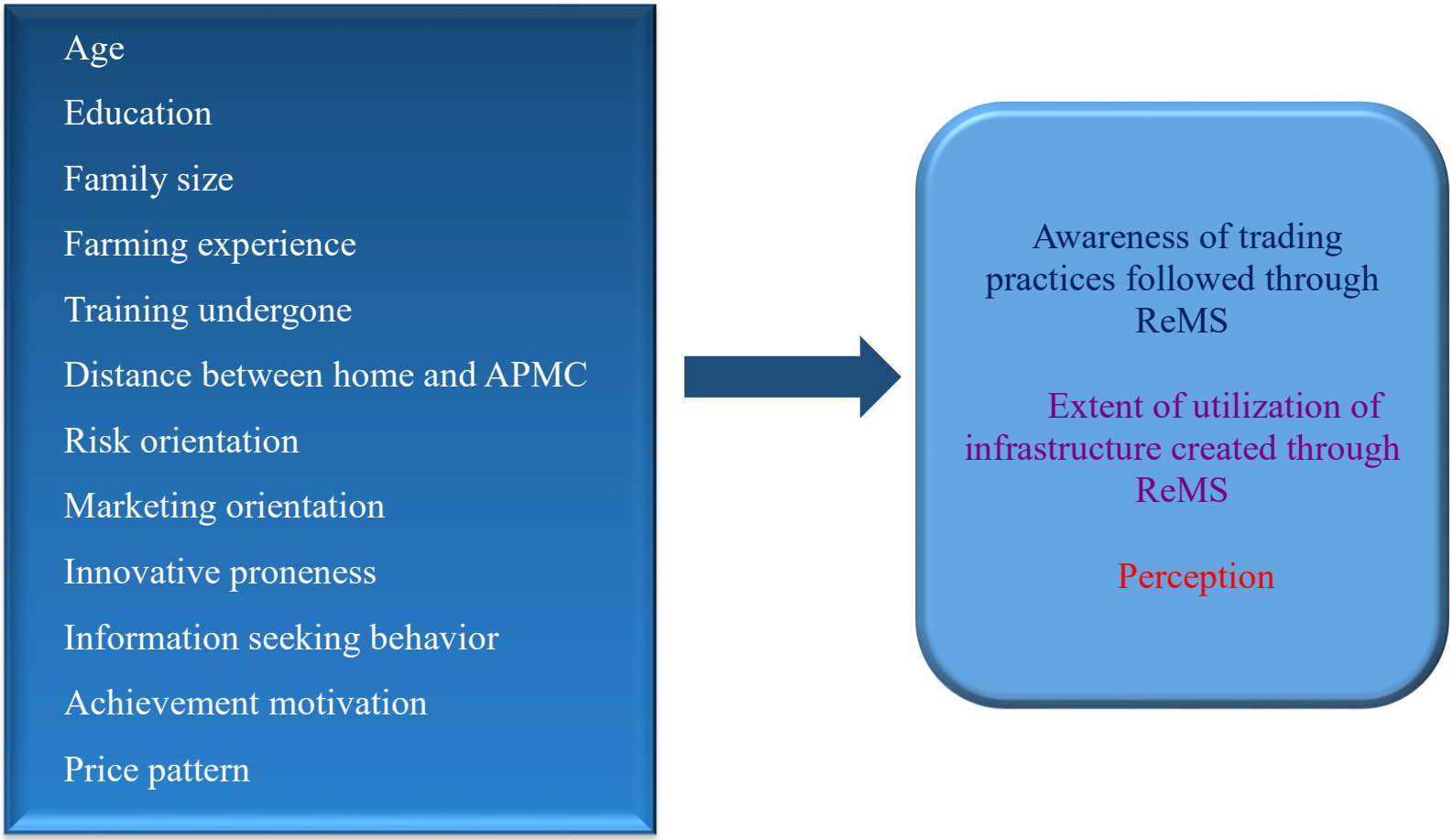


Fig. 4: Conceptual model of the study depicting the variables selected for the study of farmers

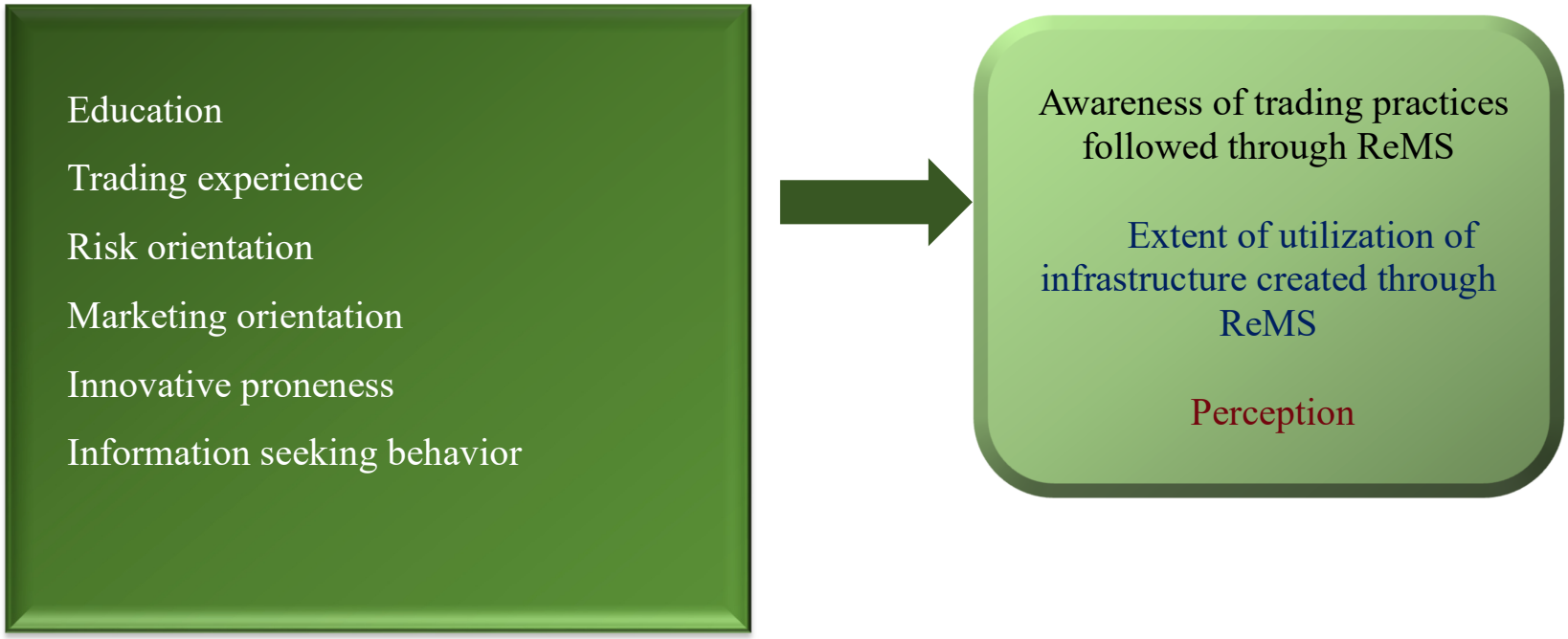


Fig. 5: Conceptual model of the study depicting the variables selected for the study of traders

IV RESULTS AND DISCUSSION

The results and discussion chapter deals with the systematic presentation and discussion of the results of the study. The results and discussion of the present study "Analysis of e trading through Rashtriya Electronic Market Services in Karnataka" are presented under the following headings

4.1. Personal, socio-economic and psychological characteristics of farmers trading through ReMS.

4.2. Personal, socio-economic and psychological characteristics of Traders trading through ReMS.

4.3. Item wise awareness of farmers about trading practices followed through ReMS

4.4. Overall awareness of farmers about trading practices followed through ReMS

4.5. Item wise awareness of Traders about trading practices followed through ReMS

4.6. Overall awareness of Traders about trading practices followed through ReMS

4.7. Item wise Perception of Farmers about trading practices followed through ReMS

4.8. Overall Perception of Farmers about trading practices followed through ReMS

4.9. Item wise Perception of Traders about trading practices followed through ReMS

4.10. Over all Perception of Traders about trading practices followed through ReMS

4.11. Item wise Extent of utilization of infrastructures created through ReMS by Farmers

4.12. Over all Extent of utilization of infrastructures created through ReMS by Farmers

Table 3: Personal, socio-economic and psychological characteristics of farmers trading through ReMS n=80

Sl. No.	Characteristics	Category	Davanagere farmers (n1=40)		Chamarajanagara farmers (n2=40)		Total n=80	
			F	%	F	%	F	%
1.	Age	Young	4	10.00	10	27.50	14	17.50
		Medium	22	55.00	21	42.50	43	53.75
		Old	14	35.00	9	30.00	23	28.75
2.	Education	Illiterate	5	12.50	4	10.00	9	11.25
		Primary school	2	5.00	4	10.00	6	7.50
		Middle school	6	15.00	8	20.00	14	17.50
		High school	10	25.00	6	15.00	16	20.00
		Pre-University	10	25.00	11	27.50	21	22.25
		Graduation and above	7	17.50	7	17.50	14	17.50
3.	Family size	Small	26	65.00	32	80.00	58	72.50
		Medium	12	30.00	7	17.50	19	23.75
		Big	2	5.00	1	2.50	3	3.75
4.	Land holding	Marginal farmers	11	27.50	8	20	19	23.75
		Small farmers	17	42.50	19	47.50	36	45.00
		Big farmers	12	30.00	13	32.50	25	31.25
5.	Farming experience	Less	3	7.50	5	12.50	8	10.00
		Moderate	13	32.50	16	40.00	29	36.25
		More	24	60.00	19	47.50	43	53.75
6.	Marketing Experience	Less	15	37.50	12	30.00	25	31.25
		Moderate	13	32.50	13	32.50	28	35
		More	12	30.00	15	37.50	27	33.75
7.	Distance from APMC	<5km	2	5.00	4	10.00	6	7.50
		5-10km	9	22.50	8	20.00	17	21.25
		10-15km	12	30.00	12	30.00	24	30.00
		>15km	17	42.50	16	40.00	33	41.25
8.	Risk Orientation	Low	11	27.50	10	25.00	19	23.75
		Medium	19	47.50	17	42.50	31	38.75
		High	10	25.00	13	32.50	30	37.50
9.	Marketing orientation	Low	9	22.50	10	25.00	26	23.75
		Medium	18	45.00	16	40.00	34	42.50
		High	13	32.50	14	35	27	33.75
10.	Innovative proneness	Low	14	35.00	11	27.50	25	31.25
		Medium	10	25.00	17	42.50	27	33.75
		High	16	40.00	12	30.00	28	35.00
11.	Information seeking behaviour	Low	12	30.00	9	22.50	21	26.25
		Medium	11	27.50	13	32.50	24	30.00
		High	17	42.50	18	45.00	35	43.75
12.	Achievemnt motivation	Low	10	25.00	9	22.50	19	23.75
		Medium	16	40.00	16	40.00	32	40.00
		High	14	35.00	15	37.50	29	36.25

*F-frequency % - Per cent

4.1: Personal, socio-economic and psychological characteristics of farmers trading through ReMS.

4.1.1 Age

It is evident from table 3 that half of the farmers, Davanagere (55.00%) and Chamarajanagara (42.50%) fall under the category of middle age group followed by old age group Davanagere (35.00%), Chamarajanagara (30.00%). Out of 80 ReMS farmers 53.75 per cent of farmers were middle aged which indicates that overall half of the farmers were middle aged group followed by old age group (28.75%). The observations made and above findings indicates that majority of the farmers were of middle age. The possible reasons for above cited results were optimistic nature of middle aged group to take up innovative technology in agricultural marketing. Availability and usage of multifunctional smartphones by the middle aged group lead to this result.

The results of the study is in agreement with the findings of Anandraja (2012), Shankarairah and Narayana Swamy (2012), Avinash (2013) and Subhash (2018).

4.1.2 Education

With regard to level of education, it is observed from table 3 that, 25 per cent of Davanagere farmers were educated up to high school and equal per cent have an education level of pre-university, which constitutes that half of the respondents (50%) were above High school education. Where in Chamarajanagara district 27.50 per cent of ReMS farmers have an education level of Pre University. Followed by 17.50 per cent of the ReMS farmers from both the district have an education level of graduation and above. In case of Davanagere farmers nearly one fifth (15.00%) middle school, followed by illiterates (12.50%) and primary school (5.00%). In case of Chamarajanagara district middle school (20.00%), high school (15.00%), primary school (10.00%) and illiterate (10.00%) was the level of education. Which constitutes to one fifth (22.50%) of the overall farmers fall under the category of pre university level of education followed by high school (20.00%), graduation (17.50%), middle school (17.50), illiterates (11.50%) and primary school (7.50%). The probable reason for majority of the farmers to be

educated up to Pre university and graduation might be because of their medium to high level of annual income as majority of them were commercial crop growers. And the present world competition might have led to pursue good education. The reason behind illiterates might be lack of interest or poor financial status of the family. Therefore, efforts needed to divert to provide education to school drop-outs and illiterates. As this ReMS trading requires computer literacy efforts has to make in conducting various functional computer literacy programmes.

The study results are in line with the findings of Avinash (2013), Gowda Govinda *et al.* (2015) and Fahad Aldosari and Mehmood Ali Noor (2017).

4.1.3 Family size

It is observed from table 3 that, two third of ReMS farmers from davanagere had small family (65.00%), followed by middle level of family (30.00%) and large families (5.00%). The same trend was observed in Chamarajanagara district where three fourth of farmers (80.00%) had small sized family followed by middle level (17.50%) and large families (2.50%). And from 80 farmers together it was observed that majority (72.50%) of the households of ReMS farmers was small sized followed by medium (23.75%) and large families (3.75%). Here the data evidence shows that two third of the households have small families, and the probable reason could be division of landholdings and marriage. If the family is small one can take risk for innovative technology adoption and the decision making is not influenced by other members of the family. The resources can be diverted towards overall growth and development of family.

Sharma (2006), Chandravadiya (2009) and Swagatika (2011) study results are in agreement with the above findings. Contradictory to the results of Sharma (2006).

4.1.4 Land holding

It is observed from the table 3 that majority of the Davanagere farmers holds small (42.50%) size of land followed by large (30.00%) and only 27.50 per cent of farmers were the owners of marginal farms. Similar observations were made in

Chamarajanagara farmers also where two fourth of the farmers holds small landholdings (47.50%) followed by large sized (32.50%) farm and only 20.00 per cent of Chamarajanagara farmers were owners of marginal farms.

Considering 80 farmers from both the district, table 1 data reveals that majority of the farmers were small farmers (45.00%), followed by large (31.25%) and marginal farms (23.75%). Probable reasons can be sighted as decrease in agricultural land and division of agricultural land as a part of inherent property**.**

The research findings of Suresh (2004) and Devalatha (2005) are in agreement with the above research finding. The results are in contradictory with the results of Nagesh (2006), Shantamani (2007) and Lopamudra (2016).

4.1.5 Farming experience

The data shown in table 3 reveals that more than half of the Davanagere farmers have more (60.00%) year of farming experience followed by 32.50 per cent of farmers having moderate experience in farming. More or less similar data is observed from farmers of Chamarajanagara where 47.50 per cent of farmers have more farming experience and 40.00 per cent of farmers have moderate experience and only 12.50 per cent of farmers have less experience in farming.

Considering all the respondents from both the district data reveals that 53.75 per cent of farmers have more experience in farming followed by 36.25 per cent of farmers with moderate level of farming experience and only 10.00 per cent of farmers have less farming experience.

The study of Uday Kumar (2010) have similar findings with above results. The above results are in contradictory with the results of Sahana (2003), Sivanarayana *et al. (*2008) and Kumar (2009).

4.1.6 Marketing experience

Table 3 data reveals that 37.50 per cent of Davanagere farmers have less marketing experience. 32.50, 30.00 per cent of farmers have moderate and high level of marketing experience, respectively. Whereas 37.50 per cent of Chamarajanagara farmers have high marketing experience followed by 32.50, 30.00 per cent of farmers having moderate and low level of farming experience.

Considering 80 farmers from both the district data envisages that 35.00 per cent of farmers have moderate level of marketing experience and 33.75 per cent of farmers have high level of marketing experience followed by 31.25 per cent of farmers having low marketing experience.

The above results are in agreement with the results of Hehlangki Tyngkan (2018).

4.1.7 Distance from APMC to home

It is evident from Table 3 that42.50 per cent farmers of davanagere travel more than 15km to reach APMC and whereas only 5.00 per cent of farmers have home within 5 km perimeter of APMC. Similar results were observed from Chamarajanagra farmers where 40.00 per cent of farmers travel more than 15km to reach APMC to sell their produce. And only 7.50 per cent of farmers have home within 5km perimeters of APMC. Considering overall 80 farmers from both the district 41.25 per cent of farmers travel more than 15 km to sell their produce through ReMS in APMCs.

The results are in accordance with the results of Narayanaswamy (2005) and Avinash (2013).

4.1.8 Risk orientation

Table 3 also reveals that as high as 47.50 per cent of the Davanagere farmers were having medium level of risk orientation, while 27.50 and 25.00 per cent of the farmers were having low and high level of risk orientation, respectively. 42.50 per cent of the Chamarajanagara farmers were having medium level of risk orientation, while 32.50 and

25.00 per cent of the farmers were having high and low level of risk orientation, respectively. Considering 80 farmers from both the district 38.75 per cent of farmers were having medium level of risk orientation, while 37.50 and 23.75 per cent of farmers were having high and low level of risk orientation, respectively.

The results are in agreement with the research findings of Monica (2011), Lakshmi (2012), Parmar (2014), Naveenkumar (2012) and Sharma *et al.* (2014).

4.1.9 Marketing orientation

Table 1 also reveals that as high as 45.00 per cent of the Davanagere farmers were having medium level of marketing orientation, while 32.50 and 22.50 per cent of the farmers were having high and low level of marketing orientation, respectively. 40.00 per cent of the Chamarajanagara farmers were having medium level of marketing orientation, while 35.00 and 25.00 per cent of the farmers were having high and low level of marketing orientation, respectively. Considering 80 farmers from both the district 42.50 per cent of farmers were having medium level of marketing orientation, while 33.75 and 23.75 per cent of farmers were having high and low level of marketing orientation, respectively.

Lavanya (2010) and Sunil (2014) have similar research findings as above. Whereas, Yadav (2001) and Asha (2015) have contradictory results.

4.1.10 Innovative proneness

It is evident from table 3 that two-fifth of the Davanagere farmers (40.00%) were having high level of innovative proneness, followed by 35.00 and 25.00 per cent of the farmers were having low and medium level of innovative proneness, respectively (Table 1). More or less similar results were observed from farmers of Chamarajanagara where 42.50 per cent were having medium level of innovative proneness, followed by 30.00 and 27.50 per cent of the farmers were having high and low level of innovative proneness, respectively. Considering 80 farmers from both the district 35.00 per cent of farmers

were having high level of innovative proneness, while 33.75 and 31.25 per cent of farmers were having medium and low level of innovative proneness, respectively.

The study findings are in agreement with the research findings of Parmar (2014). Whereas, Pooja Patel *et al.* (2014), Chhodavadia (2016) and Rajput (2016) have contradictory results in comparison to my study.

4.1.11 Information seeking behaviour

It is perceptible from table no. 3 that a good number of the Davanagere farmers (42.50%) were belonging to high category of information seeking behaviour and 30.00 per cent of the farmers were belonging to low category of information seeking behaviour. One-fourth of the farmers (25.00%) were belonging to medium category of information seeking behaviour. Whereas more than one-fifth (45.00%) of Chamarajanagara farmers were belonging to high category of information seeking behaviour and 32.50 per cent of the farmers were belonging to medium category of information seeking behaviour. One-fifth of the farmers (22.50%) were belonging to low category of information seeking behaviour. Considering 80 farmers from both the district 43.75 per cent of farmers were having high level of information seeking behaviour, while 30.00 and 26.25 per cent of farmers were having medium and low level of information seeking behaviour, respectively.

Ulrich Kleih *et.al.,* (2004) results are in line with the above results.

4.1.12 Achievement motivation

Table 3 also reveals that as high as 40.00 per cent of the Davanagere farmers were having medium level of achievement motivation, while 35.00 and 25.00 per cent of the farmers were having high and low level of achievement motivation, respectively. 40.00 per cent of the Chamarajanagara farmers were having medium level of achievement motivation, while 37.50 and 22.50 per cent of the farmers were having high and low level of achievement motivation, respectively. Considering 80 farmers from both the district 40.00 per cent of farmers were having medium level of achievement motivation, while

36.25 and 23.75 per cent of farmers were having high and low level of achievement motivation, respectively.

The research findings are in accordance with the research findings of Devalatha (2005), Narayanaswamy (2005) and Asha (2015). Gopala (2010) and Sangappa (2012) results are contradictory to the above mentioned results.

Table 4: Personal, socio-economic and psychological characteristics of Traders trading through ReMS. n=40

Sl. No.	Characteristic	Category	Davanagere Traders (n1=20)		Chamarajanagara Traders (n2=20)		Total n=40	
			F	%	F	%	F	%
1.	Education	Illiterate	1	5.00	1	5.00	2	5.00
		Primary school	1	5.00	1	5.00	2	5.00
		Middle school	1	5.00	1	5.00	2	5.00
		High school	7	35.00	6	30.00	13	32.50
		Pre-University	7	35.00	7	35.00	14	35.00
		Graduation and above	3	15.50	4	20.00	7	17.50
2.	Trading experience	Less	8	40.00	7	35.00	15	37.50
		Moderate	9	45.00	7	35.00	16	40.00
		More	3	15.00	6	30.00	9	22.50
3.	Risk Orientation	Low	4	20.00	4	20.00	8	20.00
		Medium	7	35.00	8	40.00	15	37.50
		High	9	45.00	8	40.00	17	42.50
4.	Marketing orientation	Low	5	25.00	4	20.00	9	22.50
		Medium	8	40.00	9	45.00	17	42.50
		High	7	35.00	7	35.00	14	35.00
5.	Innovative proneness	Low	4	20.00	4	20.00	8	20.00
		Medium	10	50.00	9	45.00	19	47.50
		High	6	30.00	7	35.00	13	32.50
6.	Information seeking behaviour	Low	6	30.00	6	30.00	12	30.00
		Medium	8	40.00	8	40.00	16	40.00
		High	6	30.00	6	30.00	12	30.00

F-frequency % - Per cent

4.2: Personal, socio-economic and psychological characteristics of Traders trading through ReMS

4.2.1. Education

With regard to level of education, it is observed from table 4 that, 35.00 per cent of Davanagere traders were educated up to high school and equal per cent have an education level of pre-university. Where in Chamarajanagara district 35.00 per cent of ReMS traders have an education level of Pre University. Followed by 15.50 per cent of the ReMS traders from Davanagere district have an education level of graduation and above and in Chamarajanagara 20.00 per cent of traders have an education level of graduation and above. In case of Davanagere traders middle school (15.00%), followed by illiterates (5.00%) and primary school (5.00%). In case of Chamarajanagara district middle school (5.00%), high school (30.00%), primary school (5.00%) and illiterate (5.00%) was the level of education. Which constitutes to one third (35.00%) of the overall traders falls under the category of pre university level of education followed by high school (32.50%), graduation (20.00%), middle school (5.00%), illiterates (5.00%) and primary school (5.00%). The probable reason for majority of the traders to be educated up to Pre university and graduation might be because of their medium to high level of annual income. And the present world competition might have led to pursue good education. As this ReMS trading requires computer literacy efforts has to make in conducting various functional computer literacy programmes.

The research findings are in line with the results of Lakshmi and Debashish (2015).

4.2.2. Trading experience

Table 4 reveals that 45.00 per cent of Davanagere traders have moderate level of trading experience followed by 40.00 and 15.00 per cent of traders have low and high level of trading experience respectively. 35.00 per cent of chamarajanagara traders have moderate level of trading experience and have an equal level of less trading experience. Whereas 30.00 per cent of traders more trading experience. Considering overall 40

traders from both the district 40.00 per cent of traders have moderate level of trading experience followed by 37.50 and 22.50 per cent of traders have low and high level of trading experience, respectively. The probable reason for moderate level of trading experience is getting license from APMC late and mostly middle age traders were involved in trading activities.

The research findings are in line with the results of Lakshmi and Debashish (2015).

4.2.3. Risk orientation

Table 4 also reveals that as high as 45.00 per cent of the Davanagere traders were having high level of risk orientation, while 35.00 and 20.00 per cent of the farmers were having medium and low level of risk orientation, respectively. 40.00 per cent of the Chamarajanagara traders were having medium level of risk orientation, while 40.00 and 20.00 per cent of the farmers were having medium and low level of risk orientation, respectively. Considering 40 traders from both the district 42.50 per cent of traders were having high level of risk orientation, while 37.50 and 20.00 per cent of traders were having medium and low level of risk orientation, respectively. The probable reason for high level risk orientation by traders might be adopting innovative market interventions and getting benefits from them. High education level lead to try innovations and ICT in trading by taking some considerable amount of risk.

4.2.4 Marketing orientation

Table 4 reveals that 40.00 per cent of the Davanagere traders were having medium level of marketing orientation, while 35.00 and 25.00 per cent of the farmers were having high and low level of marketing orientation, respectively. 45.00 per cent of the Chamarajanagara traders were having medium level of marketing orientation, while 35.00 and 20.00 per cent of the traders were having high and low level of marketing orientation, respectively. Considering 40 traders from both the district 42.50 per cent of farmers were having medium level of marketing orientation, while 35.00 and 22.50 per cent of traders were having high and low level of marketing orientation, respectively.

4.2.5 Innovative proneness

It is observed from the table 4 that half of the Davanagere traders (50.00%) were having medium level of innovative proneness, followed by 30.00 and 20.00 per cent of the traders were having high and low level of innovative proneness, respectively (Table 2). More or less similar results were observed from traders of Chamarajanagara where 45.00 per cent were having medium level of innovative proneness, followed by 35.00 and 20.00 per cent of the farmers were having high and low level of innovative proneness, respectively. Considering 40 traders from both the district 47.50 per cent of farmers were having medium level of innovative proneness, while 32.50 and 20.00 per cent of traders were having high and low level of innovative proneness, respectively.

4.2.6. Information seeking behaviour

Table no.4 reveals that a good number of the Davanagere traders (40.00%) were belonging to medium category of information seeking behaviour and equal percentage (30.00%) of traders were falling under the category of high and low information seeking behaviour. Same results were obtained from traders of Chamarajanagara district, which comprises exactly same results by 40 traders from both the districts.

The results of Lakshmi and Debashish (2015) are in line with the above mentioned results.

4.3. Item wise awareness of farmers about trading practices followed through ReMS

From table no. 5 it is evident that, out of 9 items of e trade cent per cent of farmers of Davanagere were aware about electronic weighing machine followed by 87.50 per cent of them were receiving SMS after the sale of their produce. Farmers of Davanagere were not aware of lot entry Id generation (65.00%), assaying laboratory (90.00%), inventory update facility (95.00%), sale receipt facility (90.00%). Orientation and information centres (82.50%), electronic warehouse facility (90.00%), and kiosk system usage (57.50%). And in e tender process majority of them were aware about bid management hall (95.00%), e auction process (80.00%), highest bidder winning the price (92.50%) and bid results declaring at 1:30 PM (100.00%).

Table 5: Item wise awareness of farmers about trading practices followed through ReMS

n=80

Sl. No.	Particulars	Davanagere farmers (n1=40)				Chamarajanagara farmers (n2=40)				Total (n=80)			
E-Trade		Aware		Not aware		Aware		Not aware		Aware		Not aware	
		F	%	F	%	F	%	F	%	F	%	F	%
1.	Lot entry ID generation	14	35.00	26	65.00	25	62.50	15	37.50	39	48.75	41	51.25
2.	Assaying laboratory	4	10.00	36	90.00	14	13.00	26	65.00	18	22.50	62	77.50
3.	Inventory update facility	2	5.00	38	95.00	4	10.00	36	90.00	8	10.00	72	90.00
4.	Sale receipt generation	4	10.00	36	90.00	14	35.00	26	65.00	18	22.50	64	77.50
5.	Post bidding Sale information sent to farmers through SMS	35	87.50	5	12.50	36	90.00	4	10.00	71	88.75	9	11.25
6.	Orientation and information centres	7	17.50	33	82.50	7	17.50	33	82.50	14	17.50	66	82.50
7.	Warehouse based sale (E-NWR)	4	10.00	36	90.00	15	37.50	25	62.50	19	23.75	61	76.25
8.	Electronic weighment	40	100.00	0	0.00	34	85.00	6	15.00	74	92.50	6	7.50
9.	Kiosk system usage	17	42.50	23	57.50	10	25.00	30	75.00	27	33.75	53	66.25
E tender													
10.	Bid management	38	95.00	2	5.00	36	90.00	4	10.00	74	92.50	6	7.50
11.	E auction process	32	80.00	8	20.00	34	85.00	6	15.00	67	83.75	13	16.25
12.	Highest bidder will win the prize	39	92.50	1	2.50	38	95.00	2	5.00	77	96.25	3	3.75
13.	Bid results declared at 1:30 PM	40	100.00	0	0.00	40	100.0	0	0.00	80	100.00	0	0.00

*F-frequency % - Per cent

Mostly similar results were observed in Chamarajanagara district where 85.00 per cent were aware about weighing machine and 90.00 per cent of the respondents were receiving SMS after the produce sale, followed by 62.50 per cent were aware about lot id generation process. ReMS farmers of Chamarajanagara was not aware about assaying laboratory (65.00%), inventory update facility (90.00%), sale receipt facility (65.00%). Orientation and information centres (82.50%), electronic warehouse facility (62.50%), and kiosk system usage (75.00%). And in e tender process majority of them were aware about bid management hall (90.00%), e auction process (85.00%), highest bidder winning the price (95.00%) and bid results declaring at 1:30 PM (100.00%).

The results observed from ReMS farmers of both the district i.e., Davanagere and Chamarajanagara constituting to 80 farmers reveals that 92.50 per cent of farmers were aware about electronic weighment facility followed by 88.75 per cent were receiving SMS after produce sale through bidding. ReMS farmers were not aware about lot entry ID generation (51.25%) assaying laboratory (77.50%), inventory update facility (90.00%), sale receipt facility (77.50%). Orientation and information centres (82.50%), electronic warehouse facility (76.25%), and kiosk system usage (66.25%). And in e tender process majority of them were aware about bid management hall (92.50%), e auction process (83.75%), highest bidder winning the price (96.25%) and bid results declaring at 1:30 PM (100.00%).

The probable reason for having more awareness about e tender process than e trade process is the early introduction and implementation of bidding e auctions through e tender which was introduced 9 years earlier than ReMS trade. Majority of the farmers were more aware about the electronic weighment facility because they were using it to weigh the produce every day. And most of the farmers were receiving SMS after the produce sale because the SMS were auto generated. Once the mobile number is registered under ReMS trade automatically the sale info is sent to the farmers through SMS.

The study results are in correspondence to research results obtained from Amarednder Reddy (2016).

Table 6: Overall awareness of farmers about trading practices followed through ReMS

n=80

Particulars		Davanagere (n1=40)			Chamarajanagara (n2=40)			Total ReMS Trade (n=80)
		E-Trade	E-Tender	Total ReMS Trade	E-Trade	E-Tender	Total ReMS Trade	
Low	F	17	2	11	13	3	14	25
	%	42.50	5.00	27.50	32.50	7.50	35.00	31.25
Medium	F	14	6	19	17	6	16	35
	%	35.00	15.00	47.50	42.50	15.00	40.00	43.75
High	F	9	32	10	10	31	10	20
	%	22.50	80.00	25.00	25.00	77.50	25.00	25.00

*F-frequency % - Per cent

4.4. Overall awareness of farmers about trading practices followed through ReMS

The above table 6 it is noticed that the awareness level of Davanagere farmers about the e trading is low (42.50%) and only 22.50 per cent of respondents had high level of awareness. But 80.00 per cent of the respondents had high level of awareness about e tender process. Which constitutes the medium level of awareness about overall ReMS trade process. Whereas 25.00 per cent of the respondents had high level of awareness about all the trading process followed in ReMS. And 27.50 per cent of the respondents fall under the category of low level of awareness.

In comparison Chamarajanagara farmers had medium level (42.50%) of awareness about e trade and high level (77.50%) of awareness about e tender. Which constitutes to medium level of 40.00 per cent of awareness about over all trading practices followed in ReMS trade. Whereas, 35.00 per cent of Chamarajanagara farmers had low level of awareness about ReMS trade. And only 25.00 per cent of the farmers had high awareness level.

Table 7: Item wise awareness of Traders about trading practices followed through ReMS

n=40

Sl. No.	Particulars	Davanagere Traders (n1=20)				Chamarajanagara Traders (n2=20)				Total (n=40)			
E-Trade		Aware		Not aware		Aware		Not aware		Aware		Not aware	
		F	%	F	%	F	%	F	%	F	%	F	%
1.	Unified license	20	100.0	0	0.00	20	100.0	0	0.00	40	100.0	0	0.00
2.	Lot entry ID generation	18	90.00	2	10.00	19	95.00	1	5.00	37	92.50	3	7.50
3.	Assaying laboratory	7	35.00	13	65.00	15	75.00	5	25.00	22	55.00	18	45.00
4.	Sale receipt generation	9	45.00	11	55.00	16	80.00	4	20.00	25	62.50	15	37.50
5.	Post bidding Sale information sent to farmers through SMS	20	100.0	0	0.00	20	100.0	0	0.00	40	100.0	0	0.00
6/	Orientation and information centers	4	20.00	16	80.00	6	30.00	14	70.00	10	25.00	30	75.00
7.	Warehouse based sale (E-NWR)	14	70.00	6	30.00	20	100.00	0	0.00	34	85.00	6	15.00
8.	Kiosk system usage	7	35.00	13	65.00	15	75.00	5	25.00	22	55.00	18	45.00
9.	Inventory update facility	6	30.00	14	75.00	2	10.00	18	90.00	8	20.00	32	80.00
10.	e permit	19	95.00	1	5.00	20	100.00	0	0.00	39	97.50	1	2.50
11.	Electronic weighment	20	100.00	0	0.00	20	100.00	0	0.00	40	100.0	0	0.00
E tender													
12.	Bid management	18	90.00	2	10.00	16	80.00	4	20.00	34	85.00	6	15.00
13.	E auction process	19	95.00	1	5.00	19	95.00	6	5.00	38	95.00	2	5.00
14.	Highest bidder will win the prize	20	100.0	0	0.00	19	95.00	2	5.00	39	97.50	1	2.50
15.	Bid results declared at 1:30 PM	20	100.0	0	0.00	40	100.0	0	0.00	40	100.0	0	0.00

*F-frequency % - Per cent

Out of 80 farmers taking consideration of both the district with 43.75 percentage them fall under the category of medium awareness level. Whereas, 31.25 per cent of farmers had low level of awareness and only 25.00 per cent of farmers had high level of awareness about overall trade process followed in ReMS.

The probable reason for medium and low level of awareness in both the district can be capsuled as because of lack of awareness programmes as well as lack of orientation and information programmes. Since the computer literacy is needed for better understanding of the ReMS trade, farmers with no or less computer literacy failed or found difficult to understand and follow up the trade process. A lot of scope can be seen in increasing the outreach of ReMS trade by giving awareness programmes and training facilities.

4.5. Item wise awareness of Traders about trading practices followed through ReMS

Table 7 reveals that a total of 15 items considered (11-e trade and 4- e tender) with this traders of Davanagere were aware of unified license (100.00%), post bidding SMS (100.00%), and electronic weighment (100.00%). Which is followed by e permit (95.00%), lot entry ID generation (90.00%), and electronic warehouse based sale (70.00%). But the traders were not aware about assaying laboratory (65.00%), sale receipt generation (55.00%), orientation and information centres (80.00%), kiosk system usage (65.00%), and inventory update facility (75.0%). In case of e tender process traders were aware about Bid management (90.00%), E auction process (95.00%), Highest bidder will win the prize (100.00%), Bid results declared at 1:30 PM (100.00%).

Table 5 reveals that traders of Chamarajanagara were aware of unified license (100.00%), post bidding SMS (100.00%), and electronic weighment (100.00%) electronic warehouse based sale and e permit (100.00%). Which is followed by, lot entry ID generation (95.00%), and assaying laboratory (75.00%), kiosk system usage (75.00%), inventory update facility (75.0%) and sale receipt generation (80.00%). But the traders were not aware about orientation and information centres (70.00%). In case of e tender process traders were aware about Bid management (80.00%), E auction process

(95.00%), Highest bidder will win the prize (95.00%), Bid results declared at 1:30 PM (100.00%).

The overall awareness of 40 traders from Chamarajanagara and Davanagere district shows that unified they were aware about license (100.00%), post bidding SMS (100.00%), and electronic weighment (100.00%), and e permit (92.75%), Which is followed by lot entry ID generation (92.50%), electronic warehouse based sale (85.50%), sale receipt generation (62.50%), assaying laboratory (55.00%) and kiosk system usage (55.00%). But the traders were not aware about orientation and information centres (75.00%) and inventory update facility (80.0%). In case of e tender process traders were aware about Bid management (85.00%), E auction process (95.00%), highest bidder will win the prize (97.50%), Bid results declared at 1:30 PM (100.00%).

The possible reasons for cent per cent awareness about unified license is because it is mandatory to have licence to undergo trade through ReMS. Awareness about post bidding SMS and e permit is also cent per cent since they both are auto generated. Usage of electronic weighment for the proper weighment made traders to have cent per cent. Comparatively traders of Chamrajanagara have more awareness about different trading practices followed in ReMS, this is because Chamarajanagara APMC is commodity specific to turmeric. And the respondents were aware about all the practices followed in e tender since they individually participated in e auction process.

Table 8: Overall awareness of Traders about trading practices followed through ReMS n=40

Particulars		**Davanagere (n1=20)**			**Chamarajanagara(n2=20)**			**Total ReMS Trade (n=40)**
		E-Trade	E-Tender	Total ReMS Trade	E-Trade	E-Tender	Total ReMS Trade	
Low	F	8	2	4	7	2	4	8
	%	40.00	10.00	20.00	35.00	10.00	20.00	20.00
Medium	F	7	6	6	7	5	5	11
	%	35.00	30.00	30.00	35.00	25.00	25.00	27.50
High	F	5	12	10	6	13	11	21
	%	25.00	60.00	50.00	30.00	65.00	55.00	52.50

*F-frequency % - Per cent

4.6. Overall awareness of Traders about trading practices followed through ReMS

It is evident from table no.8 is that traders of Davanagere have low level (40.00%) of awareness about e trade process where as high (60.00%) awareness was observed about e tender process. Only 25.00 per cent of traders have high level of awareness about e trade process. The awareness about complete ReMS trade is high which constitutes to 50.00 per cent. 20.00 per cent of traders have low level of awareness about all the trading practices followed in ReMS.

Traders of Chamarajanagara have medium level (35.00%) of awareness and equal percentage (35.00%) of traders have low awareness level about e trade process where as high (65.00%) awareness was observed about e tender process. Only 30.00 per cent of traders have high level of awareness about e trade process. The awareness about complete ReMS trade is high which constitutes to 55.00 per cent and 20.00 per cent of traders have low level of awareness about all the trading practices followed in ReMS.

Overall awareness about trading practices followed in ReMS by 40 traders of Davanagere and Chamarajanagara was observed to be high with 52.50 per cent. Followed by medium level 27.50 per cent. And 20.00 per cent of respondents fall under the category of low level of awareness about ReMS trade.

The reasons like better computer literacy education and knowledge about usage of smartphones and modern technologies can be quoted as major ones. Other reasons could be the better understandings of the electronic trading process.

The study results are in correspondence to research results obtained from Amarednder Reddy (2016).

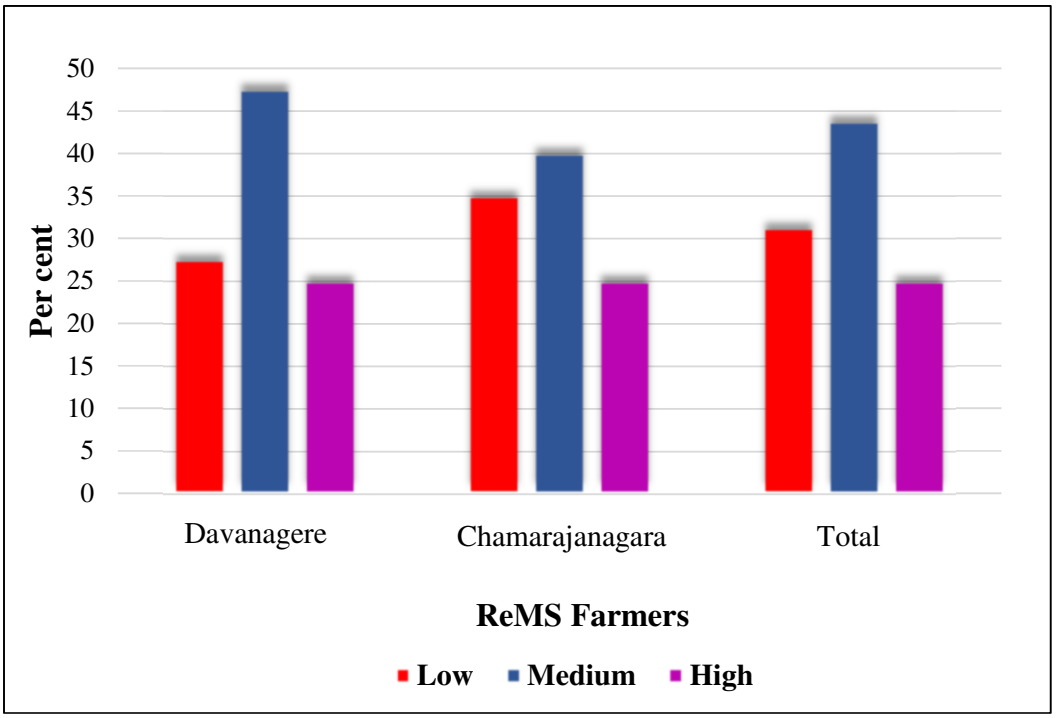


Fig. 6: Overall awareness of farmers about trading practices followed through ReMS

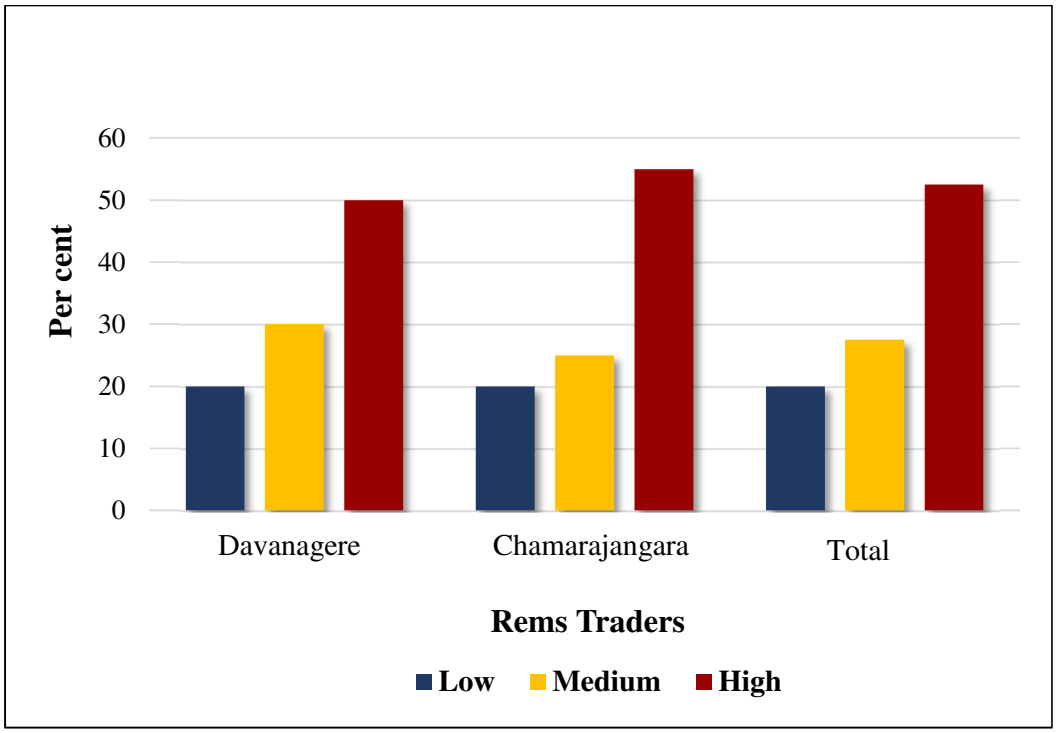


Fig. 7: Overall awareness of traders about trading practices followed through ReMS

Table 9: Item wise Perception of Farmers about trading practices followed through ReMS n=80

Sl.no.	Particulars	Davanagere (n1-40)		Chamarajanagara (n2-40)		Total (n1+n2=80)	
		Score	Rank	Score	Rank	Score	Rank
A.	**Purpose of using ReMS**						
1.	ReMS application is used only to check prices and it is easier	73	I	79	1	152	I
2.	ReMS application is used for price checking and sale of the produce	55	IV	58	III	113	IV
3.	ReMS application is used for price checking, sale and online payment and it is easier	60	II	57	IV	117	III
4.	ReMS trading is better than the conventional trading	58	III	63	II	121	II
B.	**Features of the ReMS application**						
5.	ReMS application is user friendly	59	III	56	IV	115	III
6.	Regularity in getting SMS after sale of the produce and online payment	109	I	107	I	216	I
7.	Transparency in testing quality of the produce and uploading the information in to the website	48	V	64	III	112	IV
8.	Very stringent in rating the specific quality parameters of the agricultural produce	58	IV	52	V	110	V
9.	Transparency in report generation	96	II	98	II	194	II
C.	**Method of payment**						
10.	Online method of payment is better than cash and cheque method	88	I	99	I	187	I
11.	Receiving payment directly from the trader helped in increasing the transparency	85	II	84	III	169	III
12.	Settlement of payment within 48hrs after the trading activities is achieved through ReMS trading	88	I	97	II	185	II
D.	**Overall performance**						
13.	Higher price realization through e-trading	67	III	78	II	115	V
14.	Low marketing cost in e-trading	47	VI	58	V	105	VI
15.	Sale process is less complicated	56	V	68	IV	118	IV
16.	Better facilities for knowing the quality of the produce	62	IV	78	II	148	III
17.	Entire produce is sold same day	98	I	106	I	204	I
18.	Satisfaction being part of Unified market platform	79	II	71	III	150	II

4.7. Item wise Perception of Farmers about trading practices followed through ReMS

The table no. 9 reveals the item wise perception of about performance of ReMS trading. Here 18 items were divided in to 4 groups and ranked individually.

Under Purpose of using ReMS application where Davanagere farmers ranked the items as follows ReMS application is used only to check prices and it is easier (I), ReMS application is used for price checking, sale and online payment and it is easier (II), ReMS trading is better than the conventional trading (III), ReMS application is used for price checking and sale of the produce (IV). Chamarajanagara farmers ranked the items in this manner: ReMS application is used only to check prices and it is easier (I), ReMS trading is better than the conventional trading (II), ReMS application is used for price checking and sale of the produce (III), ReMS application is used for price checking and sale of the produce (IV). The overall perception scores of 80 farmers from both the district were ranked as follows: ReMS application is used only to check prices and it is easier (I), ReMS trading is better than the conventional trading (II), ReMS application is used for price checking, sale and online payment and it is easier (III), ReMS application is used for price checking and sale of the produce (IV).

Based on the features of ReMS application farmers perception was scored and ranked as follows: Farmers of Davanagere ranked items like: Regularity in getting SMS after sale of the produce and online payment (I), Transparency in report generation(II), ReMS application is user friendly (III), Very stringent in rating the specific quality parameters of the agricultural produce(IV), Transparency in testing quality of the produce and uploading the information in to the website (V). Farmers of Chamarjanagara perceived almost similar : Regularity in getting SMS after sale of the produce and online payment(I), Transparency in report generation(II), Transparency in testing quality of the produce and uploading the information in to the website(III), ReMS application is user friendly(IV), Very stringent in rating the specific quality parameters of the agricultural produce(V). Overall considering 80 farmers the perception ranks were as follows: Regularity in getting SMS after sale of the produce and online payment(I), Transparency

in report generation(II), ReMS application is user friendly(III), Transparency in testing quality of the produce and uploading the information in to the website(IV), Very stringent in rating the specific quality parameters of the agricultural produce(V).

Considering farmers perception about method of payment followed in ReMS, Davanagere farmers perceived as follows: Online method of payment is better than cash and cheque method(I), Settlement of payment within 48hrs after the trading activities is achieved through ReMS trading(II), Receiving payment directly from the trader helped in increasing the transparency(III). The perception of Chamrajanagara farmers were same as Davanagere farmers which in together making same overall results of 80 farmers.

The perception about the overall performance of ReMS by Davanagere farmers were ranked as follows: Entire produce is sold same day(I), Satisfaction being part of Unified market platform(II), Higher price realization through e-trading(III), Better facilities for knowing the quality of the produce (IV), Sale process is less complicated (V), Low marketing cost in e-trading (VI). Chamarajanagara farmers have more or less similar perception such as: Entire produce is sold same day(I), Better facilities for knowing the quality of the produce(II), Higher price realization through e-trading(II), Satisfaction being part of Unified market platform(III), Sale process is less complicated(IV), Low marketing cost in e-trading(V). The overall perception of 80 farmers from both the district were as follows: Low marketing cost in e-trading(I), Satisfaction being part of Unified market platform(II), Better facilities for knowing the quality of the produce(III), Sale process is less complicated(IV), Higher price realization through e-trading(V), Low marketing cost in e-trading(VI).

The probable reasons for farmers to have better perception about online payment is it is presumed to increase transparency and will cultivate a habit of saving if money is directly transferred to farmer's bank accounts. Farmers also perceived that ReMS helped them to sell their produce in single day and the sale process is not continued to next day. Farmers were receiving the money of their produce sale within 48 hrs of trading through RTGS or online payment which helped them to undertake other agricultural activities

without delay. Farmers perceive that transparency in report generation has been increased.

The study results are in line with the results obtained from Pavithra and Nayak (2018).

Table 10: Overall Perception of Farmers about trading practices followed through ReMS

n=80

Sl. No.	Particulars	Davanagere Farmers (n1=40)		Chamarajanagara Farmers (n2=40)	Over all (n=80)
1.	Poor	F	22	13	35
		%	55.00	32.50	43.75
2.	Average	F	7	15	22
		%	17.50	37.50	27.50
3.	Better	F	11	12	23
		%	27.50	30.00	28.75

*F-frequency % - Per cent

4.8. Overall Perception of Farmers about trading practices followed through ReMS

Table 10 states that the overall perception of Davanagere farmers about performance of ReMS trading is poor (55.00%) whereas 27.50 per cent of respondents opined that the services of ReMS was better. In case of Chamarajanagara district ReMS farmers had average perception (37.50%) about the functioning of ReMS whereas 32.50 and 30.00 per cent had poor and better perception respectively. The results also revealed that overall with 80 farmers from both the district have poor (43.75%) perception followed by better (28.75%) and average (27.50%). Poor perception by farmers might be because of the difficulty in operating the ReMS application and their usage. Other reasons might be lack of interest in knowing and understanding the services of ReMS application.

The study results are in line with the results obtained from Pavithra and Nayak (2018).

Table 11: Item wise Perception of Traders about trading practices followed through ReMS

n=40

Sl.no.	Particulars	Davanagere (n1=20)		Chamarajanagara (n2=20)		Total (n1+n2)	
		Score	Rank	Score	Rank	Score	Rank
1.	Single unified license is better than previous licence method	56	I	55	I	111	I
2.	Training facilities on e-trading is adequate	27	XII	42	X	69	XIV
3.	User friendly software	36	IX	48	V	84	X
4.	Volume of produce for sale has increased	34	X	36	XI	70	XIII
5.	Infrastructure for e- trading is sufficient	33	XI	45	VII	78	XII
6.	Time available for e-bidding is sufficient	53	III	48	V	101	IV
7.	Payment transaction time has reduced	51	IV	43	IX	94	VII
8.	No technical constraints in using the ReMS application	25	XIII	36	XI	61	XV
9.	Time available for e-bidding is sufficient	56	I	44	VIII	100	V
10.	Market integration and access to farmers has increased	42	VII	42	X	84	X
11.	Availability of sufficient warehouse facility	47	VI	43	IX	90	VIII
12.	Can cope up with peak sale days	50	V	50	III	100	V
13.	Quality of the traded produce is increased	41	VIII	47	VI	88	IX
14.	No scope for price manipulation	54	II	49	IV	103	III
15.	Market Competition has been increased due to e trading.	36	IX	47	VI	83	XI
16.	Transparency has been increased after the introduction of e trading	50	V	53	II	107	II
17.	Export quality produce can be expected	23	XIV	30	XII	52	XVI
18.	Satisfaction being the part of unified market platform	50	V	45	VII	95	VI

4.9. Item wise Perception of Traders about trading practices followed through ReMS

Table no. 11, where 18 Items were considered to measure the perception of traders about the performance of ReMS. And the ranks were given based on traders' perception. The first five items which were perceived as best by the traders of Davanagere were as follows: Single unified license is better than previous license method (I), Online payment method is better than cash or cheque method (II), No scope for price manipulation (III), Time available for e-bidding is sufficient (IV), Can cope up with peak sale days (V), Transparency has been increased after the introduction of e trading(V) Satisfaction being the part of unified market platform (V). The five least perceived items by traders of davanagere were: Volume of produce for sale has increased (X), Infrastructure for e- trading is sufficient (XI), Training facilities on e-trading is adequate (XII), No technical constraints in using the ReMS application(XIII), Export quality produce can be expected (XIV).

The first five best perceived items ReMS by Chamarajanagara traders were as follows: Volume of produce for sale has increased (I), Transparency has been increased after the introduction of e trading (II), Can cope up with peak sale days (III), No scope for price manipulation (IV), Time available for e-bidding is sufficient

(V), User friendly software (V). And least perceived five items of ReMS by traders of Chamarajanagara were as follows: Training facilities on e-trading is adequate(X), Market integration and access to farmers has increased (X), Volume of produce for sale has increased(XI), No technical constraints in using the ReMS application (XI), Export quality produce can be expected (XII).

Overall considering 40 traders from both the district have perceived these five items of ReMS as better: Single unified license is better than previous licence method (I), Transparency has been increased after the introduction of e trading (II), No scope for price manipulation (III), Time available for e-bidding is sufficient (IV), Time available for e-bidding is sufficient (V). Least perceived five items of ReMS were as follows:

Infrastructure for e- trading is sufficient (XII), Volume of produce for sale has increased (XIII), Training facilities on e-trading is adequate (XIV), No technical constraints in using the ReMS application (XV) and Export quality produce can be expected (XVI)

Table 12: Over all Perception of Traders about trading practices followed through ReMS

N=40

Sl. No.	Particulars	Davanagere Traders (n=20)		Chamarajanagara Traders (n=20)	Over all (N=40)
1.	Poor	F	3	4	7
		%	15.00	20.00	17.50
2.	average	F	8	7	15
		%	40.00	35.00	37.50
3.	better	F	9	9	18
		%	45.00	45.00	45.00

4.10. Over all Perception of Traders about trading practices followed through ReMS

From table 12 it is obvious that the overall perception of Davanagere traders about performance of ReMS trading is better (45.00%) whereas 40.00 per cent of respondents opined that the services of ReMS was average. In case of Chamarajanagara district ReMS traders had better perception (37.50%) about the functioning of ReMS whereas 35.00 and 20.00 per cent had average and poor perception respectively. The result also revealed that overall with 40 traders from both the district have better (45.00%) perception followed by average (37.50%) and poor (17.50%). Better perception by traders might be because of the better computer knowledge and usage of smartphones and having much experience in operation different mobile applications. Traders have better understanding of entire ReMS trading process made them to have better perception about the performance of ReMS.

Pavithra *et. al.,* (2018) results are in line with the results obtained above.

Table 13: Item wise Extent of utilization of infrastructures created through ReMS by Farmers

n=80

Sl. No.	Particulars		Davanagere Farmers (n1=40)			Chamarajanagara Farmers (n2=40)			Total (n=80)		
			Fully utilized	Partially utilized	Not utilized	Fully utilized	Partially utilized	Not utilized	Fully utilized	Partially utilized	Not utilized
I.	**E Trade**										
1.	Lot entry ID generation	F	2	26	12	7	16	17	9	42	29
		%	5.00	65.00	30.00	17.50	40.00	42.50	11.25	52.50	36.25
2.	Assaying laboratory	F	1	9	30	4	12	24	5	21	54
		%	2.50	22.50	75.00	10.00	30.00	60.00	6.25	26.25	67.50
3.	Inventory update facility	F	2	2	36	3	7	30	5	9	66
		%	5.00	5.00	90.00	7.50	17.50	75.00	6.25	11.25	82.50
4.	Sale receipt generation	F	4	10	26	6	15	19	10	25	45
		%	10.00	25.00	65.00	15.00	37.50	47.50	12.50	31.25	56.25
5.	Computerized sale receipt generation	F	1	22	17	6	16	18	7	38	35
		%	2.50	55.00	22.50	15.00	40.00	45.00	8.75	47.50	43.75
6.	e-auction on UMP	F	6	13	21	9	23	8	15	21	29
		%	15.00	32.50	52.50	22.50	57.50	20.00	18.75	26.25	36.25
7.	Orientation and information centres)	F	5	10	25	4	6	30	9	16	55
		%	12.50	25.00	62.50	10.00	15.00	75.00	11.25	20.00	68.75
8.	Electronic weighment	F	35	3	2	40	0	0	75	3	2
		%	87.50	7.50	5.00	100.0	0.00	0.00	93.75	7.50	5.00
9.	Kiosk system usage	F	4	8	26	2	5	33	6	13	60
		%	10.00	20.00	65.00	5.00	12.50	82.50	7.50	16.25	73.75
10.	Warehouse based sale (E-NWR	F	2	4	34	4	5	31	6	9	65
		%	5.00	10.00	85.00	10.00	12.50	77.50	7.50	11.25	81.25
	E Tender										
11.	Bid management	F	36	3	1	35	4	1	71	7	2
		%	90.00	7.50	2.50	87.50	10.00	4.00	88.75	8.75	2.50
12.	E auction process	F	29	8	3	28	8	4	57	16	7
		%	72.50	20.00	7.50	70.00	20.00	10.00	71.25	20.00	8.50
13	Highest bidder will win the prize	F	35	4	1	35	3	2	70	7	3
		%	87.50	10.00	4.00	87.50	7.50	5.00	87.50	8.50	3.75
14	Bid results declared at 1:30 PM	F	38	1	1	37	2	1	75	3	2
		%	95.00	2.50	2.50	92.50	5.00	2.50	93.75	3.75	2.50

*F-frequency % - Per cent

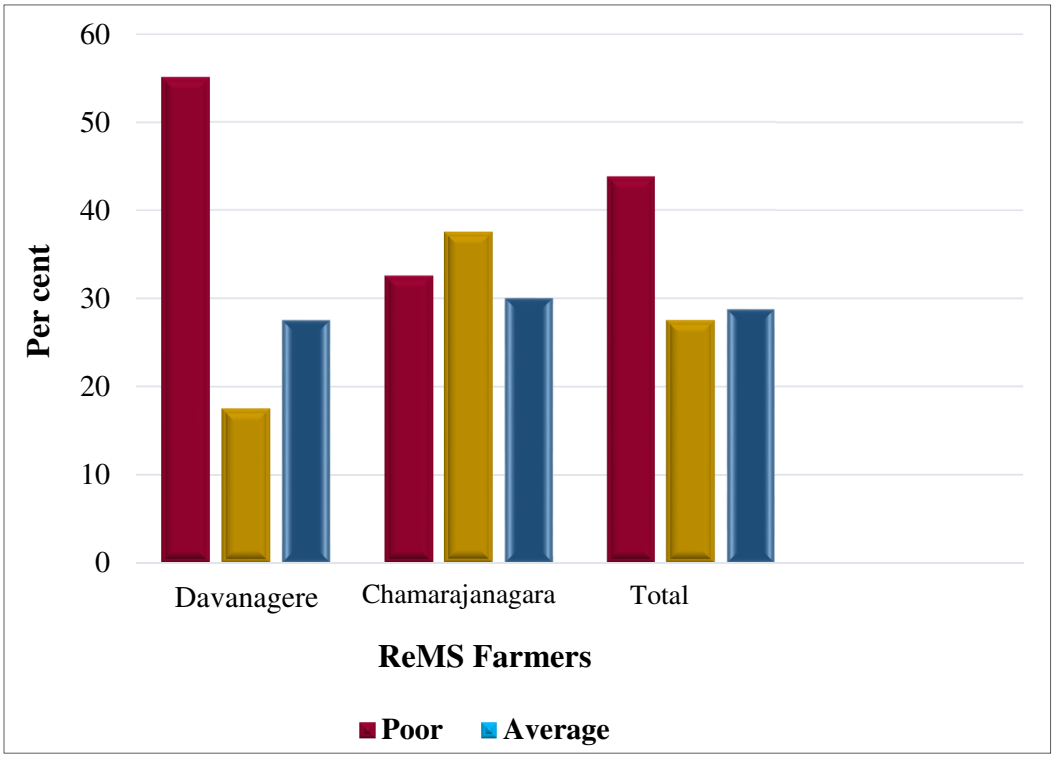


Fig. 8: Overall Perception of Farmers about trading practices followed through ReMS

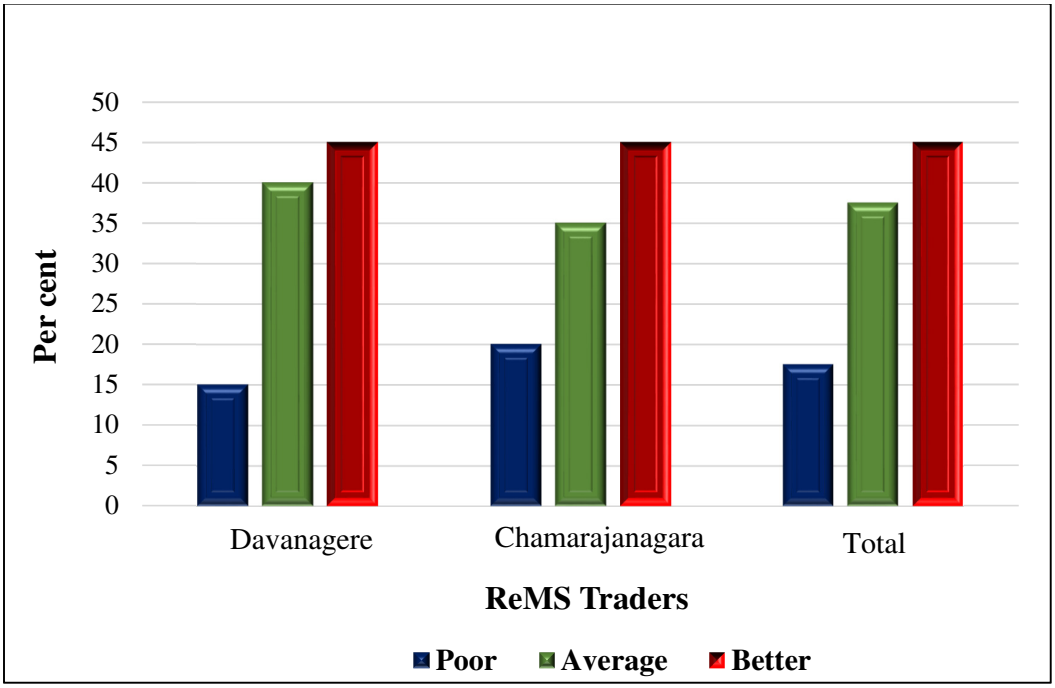


Fig. 9: Overall Perception of Traders about trading practices followed through ReMS

4.11. Item wise Extent of utilization of infrastructures created through ReMS by Farmers

The above table no. 13 reveals the extent of utilization of infrastructures created through ReMS. Under e trade infrastructures, farmers of Davanagere partially (65.00%) utilises the facility of lot entry ID generation. Where assaying laboratory was not utilized (75.00%), inventory update facility is not utilised (90.00%), sale receipt generation facility is not utilised of the extent of 65.00 per cent, whereas computerised sale receipt is generated partially to the extent of 55.00 per cent. 62.50 per cent of orientation and information centres were not utilized followed by 65.00, and 85.00 per cent of kiosk system and electronic warehouse facility receipt is not utilized respectively. Where only electronic weighment is utilized to the extent of 87.50 per cent.

The extent of utilization of infrastructures created through ReMS. Under e trade infrastructures, farmers of Chamarajanagara partially (40.00%) utilises the facility of lot entry ID generation. Where assaying laboratory was not utilized (60.00%), inventory update facility is not utilised (75.00%), sale receipt generation facility is not utilised of the extent of 47.50 per cent, whereas computerised sale receipt is generated partially to the extent of 40.00 per cent. 75.00 per cent of orientation and information centres were not utilized followed by 82.50, and 77.50 per cent of kiosk system and electronic warehouse facility receipt is not utilized, respectively. Where only electronic weighment is utilized to the extent of cent per cent.

Whereas, under e tender overall by 80 farmers infrastructures like bid management hall (88.75%), e auction process (71.25%), highest bidder will win the prize (87.50%) were utilized.

4.12. Over all Extent of utilization of infrastructures created through ReMS by Farmers

Table no 14 reveals that the medium level (37.50%) of ReMS infrastructures have been utilized by Davanagere farmers. Followed by high (32.50%) and low (30.00%) level of utilization of infrastructures created through ReMS. The same pattern of utilization of infrastructures was observed from Chamarajanagara farmers with medium level (52.50%) utilization followed by low (27.50%) and high (20.00%) level of infrastructure

utilization. The pattern of ReMS infrastructure utilization from 80 farmers of both the district were categorized as medium (45.00%) level followed by high level (26.25%) and low level with 23.75 percentage. The presumed reasons medium level of infrastructure utilization by farmers is not aware of the availability of certain infrastructures. Lack of interest in utilizing them for better results were noticed. Farmers opines that they doesn't find any significance in utilising certain infrastructures.

Table 14: Over all Extent of utilization of infrastructures created through ReMS by Farmers

n=80

Sl. No.	Particulars	Davanagere Farmers (n1=40)		Chamarajanagara Farmers (n2=40)	Over all (n=80)
1.	Low	F	12	11	23
		%	30.00	27.50	23.75
2.	Medium	F	15	21	36
		%	37.50	52.50	45.00
3.	High	F	13	8	21
		%	32.50	20.00	26.25

*F-frequency % - Per cent

The results of the study are in contradictory to the study results of Barman and Namita Devi (2004), Pant *et. al.,* (2004), Agwu *et al.* (2008), Chahal and Kataria (2008). The results of Marc and Kristi (2012), Amrutha *et. al.,* (2014), Ramesh *et al.* (2015) and Dileep Kumar (2016) are in line with the above mentioned results.

4.13. Item wise Extent of utilization of infrastructures created through ReMS by Traders

Table no. 15 reveals that traders of Davanagere utilizes cent per cent of unified licence, e permit, electronic weighment and bid management hall followed by, 95 per cent utilization of e auction on UMP. Similar results were observed from traders of Chamarajanagara.

Table 15: Item wise Extent of utilization of infrastructures created through ReMS by Traders

n=40

Sl. No.	Particulars		Davanagere Traders (n1=20)			Chamarajanagara Traders (n2=20)			Total (n=40)		
			Fully utilized	Partially utilized	Not utilized	Fully utilized	Partially utilized	Not utilized	Fully utilized	Partially utilized	Not utilized
I.											
1.	Unified license	F	20	0	0	20	0	0	40	0	0
		%	100.0	0.00	0.00	100	0.00	0.00	100	0.00	0.00
2	Lot entry ID generation	F	6	8	6	11	6	3	17	14	9
		%	30.00	40.00	30.00	55.00	30.00	15.00	42.50	35.00	22.50
3.	Assaying laboratory	F	3	7	10	2	9	9	5	16	19
		%	15.00	35.00	50.00	10.00	45.00	45.00	12.50	40.00	47.50
4	Inventory update facility	F	4	3	13	3	7	10	7	10	23
		%	20.00	15.00	65.00	15.00	35.00	50.00	17.50	25.00	57.50
5	Sale receipt generation	F	2	7	11	7	12	1	9	19	12
		%	10.00	35.00	55.00	35.00	60.00	5.00	22.50	47.50	30.00
6.	Computerized settlement slip	F	3	5	12	10	8	2	13	13	14
		%	15.00	25.00	60.00	50.00	40.00	10.00	32.50	32.50	35.00
7.	e permit	F	20	0	0	20	0	0	40	0	0
		%	100	0.00	0.00	100	0.00	0.00	100	0.00	0.00
8	Orientation and information centers	F	3	4	13	3	6	11	6	10	24
		%	15.00	20.00	65.00	15.00	30.00	55.00	15.00	25.00	60.00
9.	Kiosk system usage	F	3	7	10	1	4	15	4	11	25
		%	15.00	35.00	50.00	5.00	20.00	75.00	10.00	27.50	62.50
10.	Warehouse based sale (E-NWR)	F	1	9	10	5	13	2	6	22	12
		%	5.00	45.00	50.00	25.00	65.00	10.00	15.00	65.00	30.00
11	Electronic weighment	F	20	0	0	20	0	0	40	0	0
		%	100.0	0.00	0.00	100.0	0.00	0.00	100.0	0.00	0.00
12	Bid management hall	F	20	0	0	20	0	0	40	0	0
		%	100.0	0.00	0.00	100.0	0.00	0.00	100.0	0.00	0.00
13	E auction on UMP	F	19	1	0	16	4	0	35	5	0
		%	95.00	5.00	0.00	80.00	20.00	0.00	87.50	12.50	0.00

*F-frequency % - Per cent

Table 16: Over all Extent of utilization of infrastructures created through ReMS by Traders

n=40

Sl. No.	Particulars	Criteria	Davanagere Traders (n1=20)		Chamarajanagara Traders (n2=20)	Over all (n=40)
1.	Low	Mean-0.5*SD	F	7	6	13
			%	35.00	30.00	32.50
2.	Medium		F	5	5	10
			%	25.00	25.00	25.00
3.	High	Mean+0.5*SD	F	8	9	17
			%	40.00	45.00	42.50

*SD= standard deviation

4.14. Over all Extent of utilization of infrastructures created through ReMS by Traders

From table no 16 it is perceptible that the high level (40.00%) of ReMS infrastructures have been utilized by Davanagere traders. Followed by low (35.00%) and medium (25.00%) level of utilization of infrastructures created through ReMS. The same pattern of utilization of infrastructures was observed from Chamarajanagara traders with high level (45.00%) utilization followed by low (30.00%) and medium (25.00%) level of infrastructure utilization. The pattern of ReMS infrastructure utilization from 40 traders of both the district were categorized as high (42.50%) level followed by low level (32.50%) and medium level with 25.00 percentage. The utilisation of infrastructures created through ReMS by traders fall under the category of medium because of the limited time available for e auction and bidding. Utilising and following all the trading process is very time consuming and it increases the time required to complete trade process. So certain services were not utilised by traders.

Table 17: Price realisation between conventional trading and ReMS trading n=40

Sl. No.	Crops	Non ReMS Price (Rs/qtl)	ReMS Price (Rs/qtl)	Price realised(Rs/qtl)	Per cent
1.	Paddy	1925	1975	50	2.53
2.	Groundnut	4050	4250	200	4.70
3.	Areca nut	32980	33215	235	0.707
4.	Turmeric	6515	7005	490	6.99

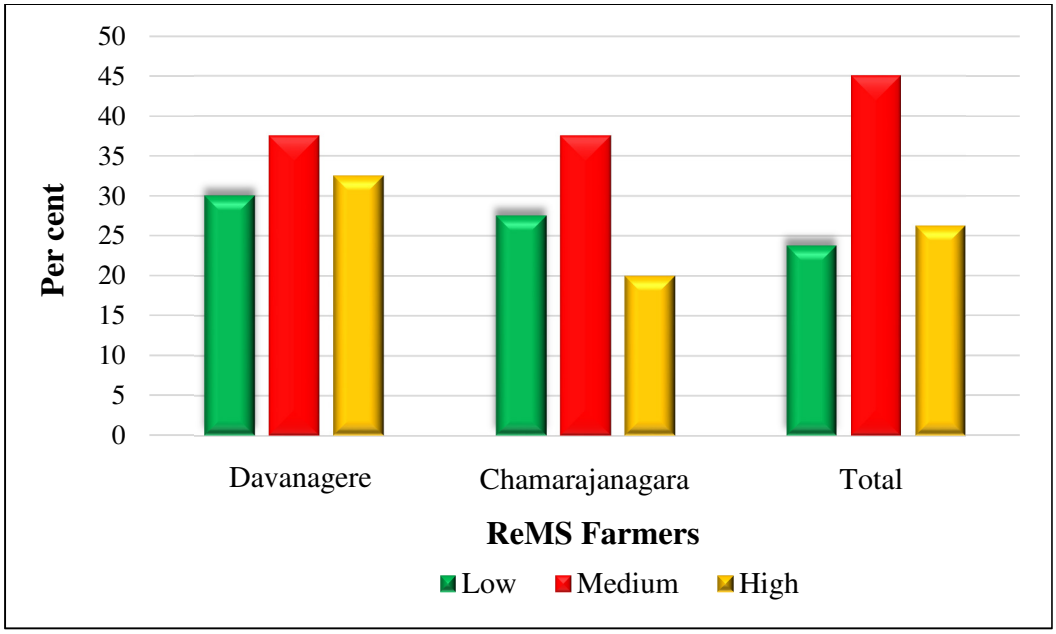


Fig.10: Over all Extent of utilization of infrastructures created through ReMS by Farmers

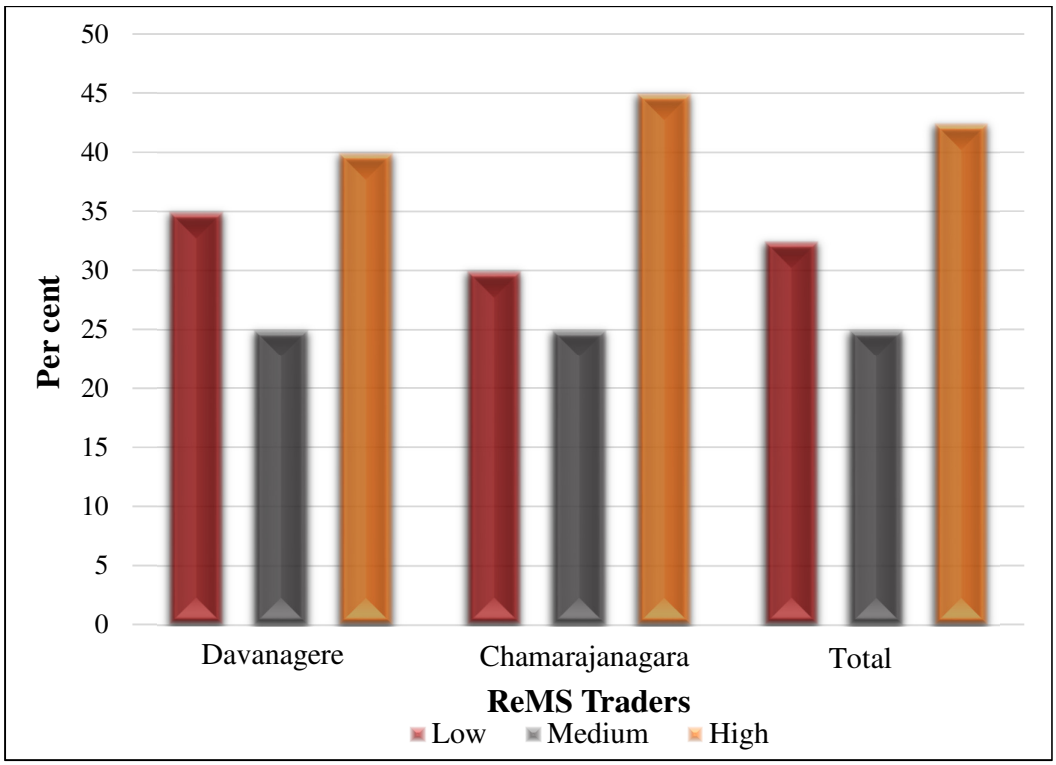


Fig. 11: Over all Extent of utilization of infrastructures created through ReMS by Traders

4.15. Price realisation between conventional trading and ReMS trading

The table no. 17 affirms that price realized by farmers as a part of ReMS trading. 2.53 per cent of price have been realised by paddy farmers of davanagere. 4.70, 0.707, 6.99 per cent of price realised by ground nut, areca nut and turmeric farmers, respectively. The probable reasons to be quoted here is increase in demand and supply for paddy, ground nut, areca nut and turmeric. There is significant noticeable increase in turmeric price because of the increased participation from turmeric traders in auction process. And in case of ground nut it is because of the decreased supply and increased demand lead to increase the price of the produce.

The research results are in line with the results of Nahatkar, *et. al.,* (1998), Ravi Kumar *et.al.,* (2001), Girish (2017), Jyothi (2011), Hehlangki Tyngkan (2018) and Pavithra and Nayak (2018).

Table 18: Relationship between profile of Farmers with their Awareness level on ReMS trading practices

n=80

Sl. No.	Characteristics	Correlation coefficient (r) (n=80)
1	Age	-0.430**
2	Education	0.455**
3	Family size	0.268^{NS}
4	Land holding	0.412**
5	Farming experience	0.274^{NS}
6	Marketing experience	0.217^{NS}
7	Distance from APMC	0.103^{NS}
8	Risk orientation	0.420**
9	Marketing orientation	0.374**
10	Innovative proneness	0.414**
11	Information seeking behaviour	0.246*
12	Achievement motivation	0.460**

NS- Non Significant

*Significant @5% level

** Significant @1% level

Zero order correlation test was employed to know the relationship between the independent variables of farmers with their awareness on ReMS trading practices.

4.16 Relationship between profile of farmers with their awareness level on ReMS trading practice

Table no. 18 explains the relationship between education, land holding, marketing orientation, risk orientation, innovative proneness and achievement motivation of farmers had positive significant relationship with the awareness level on ReMS trading at one per cent level, Variables such as information seeking behaviour have significant relationship with the awareness level of farmers on ReMS trading at five per cent level. Whereas age have negative significant relationship with awareness level of farmers about ReMS trading at one per cent level of significance. Family size, distance from APMC to farmers villages, marketing experience and farming experience were not having significant relationship with the awareness level of farmers on agricultural programmes.

The explanation for the personal, socio-economic, psychological and communication characteristics of farmers having significant to highly significant relationship with their awareness level of agricultural programmes is presented in the ensuing paragraphs

4.16.1 Age and awareness level on ReMS trading practices

Where it is observed from table no. 18 that age is negatively correlated with awareness level of farmers at one per cent level of significance. Which signifies that lesser the age more is the awareness level. Young and middle age group have high awareness about trading practices followed in ReMS than old age respondents. Young and middle age people were curious about innovative technology introduced in agricultural marketing and were happened to adopt it. Hence, there is high significance between these two variables with negative correlation.

4.16.2 Education and awareness level on ReMS trading practices

It is evident from table no. 18 that there exist a significant relationship between educational levels of farmers with their awareness on ReMS trading at one per cent level of significance. Education provides an opportunity for the farmers to expose themselves to mass media, to attend different awareness programmes and training programmes which carry messages on innovative technology introduced in agricultural marketing and introduction of different information and communication tools by Karnataka State Department of Agriculture through APMCs, hence there exist a significant relationship between education and awareness level.

The results of Sinja *et. al.,* (2006) and Irene Teresia *et al.* (2017) are in line with the above results.

4.16.3 Land holding and awareness level on ReMS trading practices

The table no. 18 reveals that there is a positive and significant correlation between size of the land holding and awareness level on ReMS trading practices at one per cent level of significance. The probable reason might be because of the fact that larger size of the land holding creates an economic base for the farmers to adopt, practice innovative technologies for deriving maximum benefit and also improves their risk bearing ability. Thus, positive correlation was found between size of land holding and entrepreneurial behaviour.

4.16.4 Risk orientation and awareness level on ReMS trading practices

The research results in table no. 18 shows that a significant relationship exists between the risk orientations of farmers with their awareness on ReMS trading practices at one per cent level of significance. If a farmer tend to overcome risk in practicing agriculture, and adopting different agricultural marketing practices, he will obviously tend to create more awareness in deriving maximum benefits under various agricultural programmes implemented at APMCs, hence there exist a significant relationship between risk orientation and awareness level.

4.16.5 Marketing orientation and awareness level on ReMS trading practices

Table 18 reveals that a farmer with high level of marketing orientation will be eager to obtain information about the new interventions, leveraging technologies, ICTs, different trading practices, electronic platforms, digitalization's, online payments available under ReMS trading implemented through APMCs. Regular visits of farmers to the APMCs has also helped the farmers in creating awareness about ReMS implemented through APMCs. Hence, there is a significant relationship between marketing orientation of farmers with their awareness on e trading at one per cent level of significance.

4.16.6 Innovative proneness and awareness level on ReMS trading practices

Table mo. 18 explains that farmers try to seek more information and adopt agricultural marketing innovations available under APMCs. They will contact extension functionaries, APMC officials to know more about the agricultural marketing interventions and different marketing practices. They were ready to take up and to give a try at market interventions which promises them to fetch more benefits than conventional trading. Hence there is a significant relationship between innovativeness of farmers and their awareness on ReMS trading practices at one per cent level of significance.

4.16.7Achievement motivation and awareness level on ReMS trading practices

Achievement motivation is the important determinant of excellence or perfection in what one does. It forces the individual towards reaching the goals which he/she has to set for himself. The farmers have excelled in knowing and obtaining the benefits of the e trading for excelling in agriculture by contacting extension functionaries at APMCs. Hence, there exists a highly significant relationship at one per cent level between achievement motivation of farmers with their awareness on e trading which is explained in table no. 18.

4.16.8 Information seeking behaviour and awareness level on ReMS trading practices

Information seeking behavior of farmers and awareness level on ReMS trading practices have positive significant relationship at five per cent level of significance.

Regular visits to APMCs might have made them to see APMC display boards describing new interventions, and constant participation in mass media watching would have facilitated them to gather information and know more about e trading. Informal means of communication and Krishi Maratha vahini might have helped to them to understand better about ReMS trading. Hence there is a positive significance between these two variables.

Table 19: Relationship between profile of Traders with their Awareness level on ReMS trading practices.

n=40

Sl. No.	Characteristics	Correlation coefficient (r) (n=40)
1	Education	0.021^{NS}
2	Trading experience	0.428*
3	Risk orientation	0.167^{NS}
4	Marketing orientation	0.475**
5	Innovative proneness	0.128^{NS}
6	Information seeking behaviour	0.387*

NS- Non Significant

*Significant @5% level

** Significant @1% level

4.17 Relationship between profile of Traders with their Awareness level on ReMS trading practices.

Table no. 19 shows that, marketing orientation has significant relationship with awareness level of traders at one per cent level of significance. Whereas, trading experience and information seeking behaviour have significant relationship at five per cent level of significance.

4.17.1 Marketing orientation and awareness level on ReMS trading practices

Table no. 19 explains that trader with high level of marketing orientation will be eager to obtain information about the new interventions, leveraging technologies, ICTs, different trading practices, electronic platforms, digitalisations, online payments available under ReMS trading implemented through APMCs. Holders of unified license have made traders to know much about e trading and made them to operate in all the APMCs over Karnataka. Resulted in increasing their marketing orientation. Hence, there is a significant relationship between marketing orientation of traders with their awareness on e trading at one per cent level of significance.

4.17.2 Trading experience and awareness level on ReMS trading practices

Table no. 19 explains that trading experience of traders have positive significant relationship with awareness level on ReMS trading at five per cent level of significance. Trading experience of the traders helped them to gain proper information abbot trading from legible and trusted sources. And also helped them to expose themselves to different interventions and might have made them to take considerable amount of risk in agricultural marketing. Hence, there is significance between these two variables.

4.17.3 Information seeking behaviour and awareness level on ReMS trading practices

Table no. 19 explains that information seeking behavior of traders and awareness level on ReMS trading practices have positive significant relationship at five per cent level of significance. APMC display boards describing new interventions, and constant participation in mass media watching would have facilitated them to gather information and know more about e trading. Informal means of communication and Krishi Maratha vahini might have helped to them to understand better about ReMS trading. Hence there is a positive significance between these two variables.

Table 20: Relationship between profile of farmers with their perception level about the functioning of ReMS

n=80

Sl. No.	Characteristics	Correlation coefficient (r) (n=80)
1	Age	-0.490**
2	Education	0.614**
3	Family size	0.120^{NS}
4	Land holding	0.320*
5	Farming experience	-0.335*
6	Marketing experience	0.123^{NS}
7	Distance from APMC	0.108^{NS}
8	Risk orientation	0.329*
9	Marketing orientation	0.223*
10	Innovative proneness	0.220*
11	Information seeking behaviour	0.369*
12	Achievement motivation	0.331*

NS- Non Significant

*Significant @5% level

** Significant @1% level

4.18. Relationship between profile of farmers with their perception level about the functioning of ReMS

Education farmers have highly significant relationship at one per cent level with their perception level about the functioning of ReMS (Table 12). Age have negative significance at one per cent level of significance and farming experience have negative significance at five per cent level of significance. While, family size, marketing experience, distance from APMC to home have no significant relationship with their perception level about the functioning of ReMS. The explanation for the personal, socio-economic, psychological and communication characteristics of farmers having significant

to highly relationship with their perception about the functioning of ReMS is given in the following paragraphs.

The explanation for the profile of farmers having significant to highly relationship with their perception about the functioning of ReMS is given in the following paragraphs.

4.18.1 Age and perception level about the functioning of ReMS

Table no. 20 reveals that age of the farmers is negatively correlated with perception level about the functioning of ReMS at one per cent level of significance. This indicates that lesser the age and lesser the farming and marketing experience in ReMS. Means young and middle age farmers have better perception about performance of ReMS than old age farmers. Young and middle age farmers would dare to undertake market interventions and grab the benefits. Hence, there is significance between these two variables.

4.18.2 Education and perception level about the functioning of ReMS

Table no. 20 reveals that better education of the farmers lead them to know and gain information about new market interventions and utilization of ICTs in agricultural marketing. Education level plays major role in information gathering behaviour of the farmers. Attending orientation and awareness programmes helped farmers to gain first-hand information about ReMS trading. These detailed information's helped farmers to have better perception about performance of ReMS trading at one per cent level of significance.

Study results of Chuleeporn (2006), Oyesola (2007), Pradeep (2012) are in agreement with the above results.

4.18.3 Land holding and perception level about the functioning of ReMS

Table no. 20 reveals that the size of the land decides the amount of risk to be taken. When farmer have large land holding he would definitely risk with certain interventions. And large farms will result in considerably increased farm produce where

farmer can choose different market channel for selling the produce. So he can utilize new interventions in agricultural marketing. Hence, there is significant relationship between land holding of farmers and perception level about the functioning of ReMS at five per cent level of significance.

4.18.4 Farming experience and perception level about the functioning of ReMS

Table no. 20 reveals that farming experience of the farmers and perception level about the functioning of ReMS have negative relation between them at five per cent level of significance. This indicates that lesser the experience more the perception about e trading. Where young and middle aged farmers have better perception about the performance of ReMS trade, because they can understand the complete e trade process in less amount of time and finds the significant benefit in adopting this new market intervention. Hence, there is significant relationship between these two variables.

4.18.5 Risk orientation and perception level about the functioning of ReMS

Table no. 20 reveals that considerable amount of risk is involved when farmer choose to sell his agricultural produce through new marketing practices. Still farmer chooses this and takes risk and sells his farm produce to harness the benefits of new market intervention. When the benefits are positive obviously farmers have better perception about ReMS services. Hence, there is significant relationship between risk orientation of farmers and perception level about the functioning of ReMS at five per cent level of significance.

4.18.6 Marketing orientation and perception level about the functioning of ReMS

Table no. 20 reveals that a farmer with high level of marketing orientation will be eager to obtain information about the new interventions, leveraging technologies, ICTs, different trading practices, electronic platforms, digitalisations, online payments available under ReMS trading implemented through APMCs. This helps in better understanding of the process which directly results in having better perception about e trade process. Hence, there is a significant relationship between marketing orientation of farmers with

their perception level about the functioning of ReMS at five per cent level of significance.

4.18.7 Innovative proneness and perception level about the functioning of ReMS

Table no. 20 reveals that farmers try to seek more information and adopt agricultural marketing innovations available under APMCs. They will contact extension functionaries, APMC officials to know more about the agricultural marketing interventions and different marketing practices. They were ready to take up and give it a try at market interventions which promises them to fetch more benefits than conventional trading. When the benefits are more farmers will have better perception about services provided by ReMS. Hence there is a significant relationship between innovativeness of farmers and perception level about the functioning of ReMS at five per cent level of significance.

4.18.8 Information seeking behaviour and perception level about the functioning of ReMS

Table no. 20 reveals that farmers would consider different formal sources, informal sources and mass media for gathering information. Where they find about the new market interventions like ReMS. They contacts APMC officials or extension agents to gather much more info about the performance of e trading and their benefits. When the benefits are attractive which leads to adoption and in having better perception. Hence, there is significant relationship between information seeking behaviour of farmers and perception level about the functioning of ReMS at five per cent level of significance.

4.18.9 Achievement motivation and perception level about the functioning of ReMS

Table no. 20 reveals that achievement is the value associated with an individual that drives them to excel thereby attain a sense of personal accomplishment. This can be achieved when farmers have availed services from ReMS and benefits were remarkable which drives them to achieve more and more and harness more benefits. Hence, there is

significant relationship between achievement motivation of farmers and perception level about the functioning of ReMS at five per cent level of significance.

Table 21: Relationship between profile of Traders with their Perception level about performance of ReMS trading practices.

n=40

Sl. No.	Characteristics	Correlation coefficient (r) (n=40)
1	Education	0.471**
2	Trading experience	0.439**
3	Risk orientation	0.253^{NS}
4	Marketing orientation	0.540**
5	Innovative proneness	0.100^{NS}
6	Information seeking behaviour	0.448**

NS- Non Significant

*Significant @5% level

** Significant @1% level

4.19. Relationship between profile of Traders with their Perception level about performance of ReMS trading practices

Education, trading experience, marketing orientation and information seeking behavior have positive significant relationship with perception level of traders about performance of ReMS trading practices at one per cent level of significance.

Following paragraphs explains in detail about the relationships between variables.

4.19.1 Education and perception level about the functioning of ReMS

It is evident from table no. 21 that higher level education leads to better understanding of the electronic trading systems. And the usage of smartphones and different applications will help the traders to know better about the performance of ReMS trading. Whereas computer literacy have direct influence on bringing clarity and better

understanding of the e trading which will obviously help to have better perception about performance of ReMS. Hence, there is a significant relationship between education of traders and perception level about the functioning of ReMS at one per cent level of significance.

The study results of Ayub (2014) and Patel (2015) is line with above results whereas, Kashem (2010), Raksha *et al.* (2015), Sulaiman Umar *et al.* (2015) are contradictory to the results.

4.19.2 Trading experience and perception level about the functioning of ReMS

It is evident from table no. 21 that trading experience of traders have positive significant relationship with perception level about performance of ReMS trading at one per cent level of significance. Trading experience of the traders helped them to gain proper information about trading from legible and trusted sources and to decide which form of trading is better for present scenario. And also helped them to expose themselves to different interventions and might have made them to take considerable amount of risk in agricultural marketing. Hence, there is significance between these two variables.

4.19.3 Marketing orientation and perception level about the functioning of ReMS

It is evident from table no. 21 that a trader with high level of marketing orientation will be eager to obtain information about the new interventions, leveraging technologies, ICTs, different trading practices, electronic platforms, digitalisations, online payments available under ReMS trading implemented through APMCs. Holders of unified license have made traders to know much about e trading and made them to operate in all the APMCs over Karnataka. Resulted in increasing their marketing orientation which in return resulted in having better perception about performance of ReMS. Hence, there is a significant relationship between marketing orientation of traders with their perception on e trading at one per cent level of significance.

4.19.4 Information seeking behaviour and perception level about the functioning of ReMS

It is evident from table no. 21 that information seeking behavior of traders and perception level about performance of ReMS trading at one per cent level of significance. APMC display boards describing new interventions, and constant participation in mass media watching would have facilitated them to gather information and know more about e trading. Informal means of communication and krishi Maratha vahini might have helped to them to understand better about ReMS trading. Benefits derived from adoption of ReMS trading might have helped them to develop better perception about ReMS trading. Hence there is a positive significance between these two variables.

Table 22: Relationship between profile of Farmers with Extent of utilization of infrastructures created through ReMS

n=80

Sl. No.	Characteristics	Correlation coefficient (r) (n=80)
1	Age	-0.345*
2	Education	0.292*
3	Family size	0.067^{NS}
4	Land holding	0.161^{NS}
5	Farming experience	0.105^{NS}
6	Marketing experience	0.499**
7	Distance from APMC	0.123^{NS}
8	Risk orientation	0.481**
9	Marketing orientation	0.071^{NS}
10	Innovative proneness	0.071^{NS}
11	Information seeking behaviour	0.481**
12	Achievement motivation	0.022^{NS}

NS- Non Significant

*Significant @5% level

** Significant @1% level

4.20. Relationship between profile of Farmers with Extent of utilization of infrastructures created through ReMS

Education and information seeking behaviour of farmers have significant relationship at five per cent level with Extent of utilization of infrastructures created through ReMS. Risk orientation have high positive significance at one per cent level of significance. Age have negative correlation at five per cent level of significance. Family size, Land holding, farming experience, distance from APMC, marketing orientation, innovative proneness, achievement motivation no significant relationship with Extent of utilization of infrastructures created through ReMS. The explanation for the personal, socio-economic, psychological and communication characteristics of farmers having significant to highly relationship with Extent of utilization of infrastructures created through ReMS is given in the following paragraphs.

4.20.1 Marketing experience with Extent of utilization of infrastructures created through ReMS

Table no. 22 depicts marketing experience of the farmers helps in choosing best form of market channel for the disposal of their produce. Their experience in this regard really matters in taking decision. And utilization of all the possible best services and infrastructures available for selling of their agricultural produce. Hence, there is significant relationship between marketing orientation of farmers with extent of utilization of infrastructures created through ReMS at one per cent level of significance.

4.20.2 Risk orientation with Extent of utilization of infrastructures created through ReMS

Table no. 22 depicts considerable amount of risk is involved when farmer choose to sell his agricultural produce through new marketing practices. Still farmer chooses this and takes risk and sells his farm produce to harness the benefits of new market intervention. In selling of the produce in different method there involves utilization of many services and infrastructures. Hence, there is significant relationship between risk

orientation of farmers with extent of utilization of infrastructures created through ReMS at one per cent level of significance.

4.20.3 Information seeking behaviour with Extent of utilization of infrastructures created through ReMS

Table no. 22 depicts farmers would consider different formal sources, informal sources and mass media for gathering information. Where they find about the new market interventions like ReMS. They contacts APMC officials or extension agents to gather much more info about the performance of e trading, infrastructures available for them and their benefits. When the benefits are attractive which leads to utilization and in having better extent of utilization of infrastructures. Hence, there is significant relationship between information seeking behaviour of farmers with extent of utilization of infrastructures created through ReMS at one per cent level of significance.

4.20.4 Age with Extent of utilization of infrastructures created through ReMS

Table no. 22 depicts that age of the farmers is negatively correlated with extent of utilization of infrastructures created through ReMS at five per cent level of significance. This indicates that lesser the age and lesser the farming and marketing experience in ReMS. Means young and middle age farmers have better knowledge about performance of ReMS than old age farmers and use the available infrastructures. Young and middle age farmers would dare to undertake market interventions and grab the benefits. Hence, there is significance between these two variables.

4.20.5 Education with Extent of utilization of infrastructures created through ReMS

Table no. 22 depicts better education of the farmers lead them to know and gain information about new market interventions and utilization of ICTs in agricultural marketing. Education level plays major role in information gathering behaviour of the farmers. Attending orientation and awareness programmes helped farmers to gain first-hand information about ReMS trading and utilising various infrastructures created

through ReMS. These detailed information's helped farmers to have better utilization of infrastructures created through ReMS trading at five per cent level of significance.

Table 23: Relationship between profile of Traders with Extent of utilization of infrastructures created through ReMS

n=40

Sl. No.	Characteristics	Correlation coefficient (r) (n=40)
1	Education	0.321**
2	Trading experience	0.324**
3	Risk orientation	0.054^{NS}
4	Marketing orientation	0.190^{NS}
5	Innovative proneness	0.082^{NS}
6	Information seeking behaviour	0.404**

NS- Non Significant

*Significant @5% level

** Significant @1% level

4.21. Relationship between profile of Traders with Extent of utilization of infrastructures created through ReMS.

Education, trading experience and information seeking behavior have positive significant relationship with extent of utilization infrastructures created through ReMS by traders at one per cent level of significance. Whereas, risk orientation, marketing orientation and innovative proneness have no significance.

Following paragraphs explains in detail about the relationships between variables.

4.21.1 Education with extent of utilization of infrastructures created through ReMS

Table no. 23 explains that higher level of education leads to better understanding of the electronic trading systems. And the usage of smartphones and different applications will help the traders to know better about the performance of ReMS trading.

Whereas computer literacy have direct influence on bringing clarity and better understanding of the e trading. Which signifies that education is important in knowing and utilizing the ReMS infrastructures. Hence, there is a significant relationship between education of traders with extent of utilization infrastructures created through ReMS by traders at one per cent level of significance.

4.21.2 Trading experience with extent of utilization of infrastructures created through ReMS

Table no. 23 explains that trading experience of traders have positive significant relationship with extent of utilization infrastructures created through ReMS by traders at one per cent level of significance. Trading experience of the traders helped them to gain proper information about e trading from legible and trusted sources and to decide which form of trading is better for present scenario. And also helped them to expose themselves to different interventions and might have made them to take considerable amount of risk in agricultural marketing. And knowing about different infrastructures has been created through ReMS and using the same for better benefits. Hence, there is significance between these two variables.

4.21.3 Information seeking behaviour with extent of utilization of infrastructures created through ReMS

Table no. 23 explains that information seeking behavior of traders have positive significant relationship with extent of utilization infrastructures created through ReMS by traders at one per cent level of significance. APMC display boards describing new interventions, and constant participation in mass media watching would have facilitated them to gather information and know more about e trading. Informal means of communication and krishi Maratha vahini might have helped to them to understand better about ReMS trading. Which also gives information about the available infrastructures for traders Benefits derived from utilization of ReMS infrastructures might have helped them to have high level of utilization extent. Hence there is a positive significance between these two variables.

Table 24. Constraints enlisted by Farmers of in usage of ReMS services.

n=80

Sl. No.	Constraints	Frequency	Percentage	Ranks
1.	Lack of Computer Knowledge	37	92.50	I
2.	Lack of Understanding of the entire UMP process	35	87.50	II
3.	Non availability of market information and price information	32	80.00	III
4.	Poor internet connectivity	30	75.00	IV
5.	Delay in market process	29	72.50	V
6.	No proper knowledge regarding grading and standardization	28	70.00	VI
7.	Power shortages	25	62.50	VII
8.	Delay in settlement of payment	24	60.00	VIII
9.	Non availability of support staff	22	55.00	IX
10.	Non availability of proper storage facility in market yard	21	52.50	X
11.	Labour shortages for Loading, unloading	19	47.50	XI
12.	Rejection of commodity by trader due to quality issue	17	42.50	XII

*Multiple responses were considered

4.22. Constraints enlisted by Farmers of in usage of ReMS services.

Table no. 25 enlists the problems faced by farmers in usage of ReMS application were as follows. Lack of Computer Knowledge (I), Lack of Understanding of the entire UMP process (II), Non availability of market information and price information (III), Poor internet connectivity (IV), Delay in market process (V), No proper knowledge regarding grading and standardization (VI), Power shortages (VII), Delay in settlement of payment (VIII), Non availability of support staff (IX), Non availability of proper storage facility in market yard (X), Labour shortages for Loading, unloading (XI), Rejection of

commodity by trader due to quality issue (XII). These were the major problems faced by farmers in utilizing the services rendered by ReMS. Where ReMS have to take actions and corrective measures in order to increase the efficiency and performance of ReMS trading.

Krishnamurthy (2000), Simpson and Docherty (2004), Hehlangki Tyngkan (2018) and Pavithra and Mahantesh Nayak (2018) got the similar results as of above.

Table 25: Constraints enlisted by Traders in usage of ReMS services

n=40

Sl. No.	Constraints	Frequency	Percentage	Ranks
1.	Electronic system does not work	38	95.00	I
2.	Poor net connectivity	36	90.00	II
3.	Grading facilities are not adequate	35	87.55	III
4.	Trust issues about quality of the produce	34	85.00	IV
5.	Difficulty in understanding whole UMP	32	80.00	V
6.	No proper storage facility	28	70.00	VI
7.	No guidance or help desk	27	67.50	VII
8.	Labour problem for loading	23	57.50	IX
9.	No proper storage facility	28	70.00	VI
10.	Difficulty in getting single license	20	50.00	X

*Multiple responses were considered

4.23. Constraints enlisted by Traders in usage of ReMS services

Table no. 25 enlists the problems faced by traders in usage of ReMS application were as follows. Electronic system does not work (I), Poor net connectivity (II), Grading facilities are not adequate (III), Trust issues about quality of the produce (IV), Difficulty in understanding whole UMP (V), No proper storage facility (VI), No guidance or help desk (VII), Online payment process is difficult (VIII), Labour problem for loading (IX), Difficulty in getting single license (X). These were the problems which needs immediate attention of the government for better performance of ReMS trading.

Shakeel-Ul-Rehman and Selvaraj (2013), Satish G. Athawale (2014) and Hehlangki Tyngkan (2018) have got similar results as of above.

Table 26: Suggestions offered by Farmers of Davanagere and Chamarajanagara in usage of ReMS services n=80

Sl. No.	Suggestions	F	%	Ranks
1.	Provision of Computer education	80	100.00	I
2.	Awareness programmes about ReMS	76	95.00	II
3.	Simplification of UMP process	75	93.75	III
4.	Provision of timely market information	71	88.75	IV
5.	Help desk	65	81.25	V
6.	Grading and standardization facility	55	68.75	VI
7.	Settlement of payment on time	45	56.25	VII

*Multiple responses were considered

4.24. Suggestions offered by Farmers of Davanagere and Chamarajanagara in usage of ReMS services

Some of the suggestions were offered by farmers in accordance for improving the services of ReMS. Such as, Provision of Computer education (I), Awareness programmes about ReMS (II), Simplification of UMP process (III), Provision of timely market information (IV), Help desk (V), Grading and standardization facility (VI), Settlement of payment on time (VII). These were major suggestions offered by farmers which they perceive as this can bring more farmers under ReMS trading.

Table 27: Suggestions offered by Traders of Davanagere and Chamarajanagara in usage of ReMS services

n=40

Sl. No.	Suggestions	F	%	Ranks
1.	Removing glitches in the ReMS application	40	100.00	I
2.	Strong Internet connectivity	35	87.50	II
3.	Proper grading and standardisation of agricultural produce	33	82.50	III
4.	Simplification of UMP process	32	80.00	IV
5.	Guidance or help desk	31	77.50	V
6.	e permit provisions before deducting market fees	25	62.50	VI
7.	Reducing market fee percentage	20	50.00	VII

*Multiple responses were considered

4.25. Suggestions offered by Traders of Davanagere and Chamarajanagara in usage of ReMS services

Table no. 27 were the suggestions offered by traders to enhance the efficiency of services provided by ReMS. These were enlisted as follows: Removing glitches in the ReMS application (I), Strong Internet connectivity (II), Proper grading and standardisation of agricultural produce (III), Simplification of UMP process (IV), Guidance or help desk (V), e permit provisions before deducting market fees (VI), Reducing market fee percentage (VII). These were the suggestions which according to traders could bring efficiency and transparency in ReMS trading system.

VI SUMMARY

Agriculture remains as the main stray of the Indian economy since time immemorial. In current scenario agriculture markets are the hub of rural economy. Agricultural marketing is more than linking the producer with consumer, it includes creation of favorable economic environment for farmers, enthuse them to grow more and get reasonable price for their produce. Thus agricultural marketing assumes significance not only to meet the food and nutrition needs of the country, but also to support the growth of the economy as a whole. A systemic change is required in agricultural marketing to cater the emerging needs and for the sector to continue to play its constructive role in the rural and economic growth.

Based on the recommendations of Agricultural Marketing Reforms Committee (2013) a crucial institutional innovation in the form a Special Purpose Vehicle - the Rashtriya e-Market Services Private Limited (ReMS) was established in 2014 as a joint venture between the Government of Karnataka and the NCDEX e-Markets Limited. The establishment of the ReMS represents a significant departure from the past. In its routine functioning, the ReMS is an implementing agency that works autonomously, even while being organically linked government of Karnataka. It sought to combine the decision making of the private sector and accountability of government. And also it guarantees financial sustainability, hence it charges 0.2 per cent of the value of the transacted produce for providing various online services. A notable feature was to move beyond automation of individual mandis towards unification of markets.

This entailed the design of a unique and innovative project involving adoption of Information and Communication Tool, **Unified Market Platform(UMP)** for modernizing APMC regulated market yards into single online marketplace. Goods in, goods out, inventory updation, e-tendering, invoice generation and settlement, assaying, market fee collection, online payment to farmers, facilitation of warehouse-based sales and single unified market license system are the provisions in this software. Display of assayed parameters on the unified platform, which enables a trader to place his bid

without being physically present. Online payment system is expected to bring more transparency in the way a farmer gets paid for.

The introduction of ReMS trade to bring efficiency and transparency in agricultural marketing system. So it is important to study the performance and functioning of ReMS. Hence, this study was undertaken which will embark a light on the present status of functioning of ReMS. It leads on better understanding of awareness, perception and extent of utilization of ReMS infrastructures by farmers and traders. Factors to be keenly considered and areas which needs major reforms are explained. With this background the present investigation 'Analysis of e-trading through Rashtriya Electronic Market Services in Karnataka' was undertaken with these specific objectives

1. To assess the awareness and perception of farmers and traders about the trading practices followed in ReMS.
2. To analyze the extent of utilization of infrastructure created through ReMS by farmers and traders.
3. To know the price realization between conventional trading and e-trading through ReMS.
4. To study the relationship between socio economic profile of farmers and traders with their awareness, extent of utilization and perception about performance of ReMS.
5. To analyze the constraints and suggestions in functioning of ReMS.

The study was conducted during 2018-2010 in Davanagere and Chamarajanagara district of Karnataka State. Chamarajanagara was having commodity specific APMC for turmeric and in Davanagere paddy, groundnut and areca nut were mainly traded through ReMS. A total of 160 respondents were selected. 40 farmers and 20 traders from each district. As well as 40 non ReMS farmers were considered they were paddy, groundnut, areca nut, and turmeric 10 no.s non ReMS farmers each. Ex-post-facto research design was employed in the present study. The data was collected using pre tested schedules.

Three dependent variables were selected for the study. Awareness of farmers and traders on trading practices followed in ReMS if the first dependent variable, Perception of farmers and traders on performance of ReMS and the other dependent variable is the extent of utilization of infrastructures created through REMS by farmers and traders.

The collected data analyzed using, mean, standard deviation, percentage and zero order correlation test.

The major findings of the study are as follows

1. One third of farmers were of middle aged in both the district Davanagere (55.00%) and Chamarajanagara (42.50%). Out of 80 ReMS farmers 53.75 per cent of farmers were middle aged which indicates that overall half of the farmers were middle aged group.

2. Majority of farmers had Pre University level of education i.e., 25.00 and 27.50 per cent in Davanagere and Chamarajanagara distrct, respectively. Which constitutes to one fifth (22.50%) of the overall 80 farmers falls under the category of pre university level of education followed by high school (20.00%), graduation (17.50%), middle school (17.50), illiterates (11.50%) and primary school (7.50%).

3. Two third of ReMS farmers from davanagere had small family (65.00%), followed by middle level of family (30.00%) and large families (5.00%). The same trend was observed in Chamarajanagra district, where more than three fourth of farmers (80.00%) have small sized family followed by middle level (17.50%) and large families (2.50%). And from 80 farmers together it was observed that majority (72.50%) of the households of ReMS farmers was small sized.

4. A good number of Davanagere farmers holds small (42.50%) size of land followed by large (30.00%) and only 27.50 per cent of farmers were the owners of marginal farms. In Chamarajanagara two-fourth of the farmers holds small landholdings (47.50%) followed by large sized (32.50%) farm and only 20.00 per

cent of Chamarajanagara farmers were owners of marginal farms. Considering 80 farmers from both the district data shows that majority of the farmers were small farmers (45.00%), followed by large (31.25%) and marginal farms (23.75%).

5. More than fifty per cent of Davanagere farmers have more (60.00%) year of farming experience followed by 32.50 per cent of farmers having moderate experience in farming. Farmers of Chamarajanagara where 47.50 per cent of farmers have more farming experience and 40.00 Per cent of farmers have moderate experience and only 12.50 per cent of farmers have less experience in farming.

6. 37.50 per cent of Davanagere farmers have less marketing experience. 32.50, 30.00 per cent of farmers have moderate and high level of marketing experience, respectively. Whereas 37.50 per cent of Chamarajanagara farmers have high marketing experience. Considering 80 farmers from both the district data envisages that 35.00 per cent of farmers have moderate level of marketing experience and 33.75 per cent of farmers have high level of marketing experience.

7. 42.50 per cent farmers of Davanagere travel more than 15km to reach APMC and whereas, only 5.00 per cent of farmers have home within 5 km perimeter of APMC. 40.00 per cent of farmers of Chamarajanagara travel more than 15km to reach APMC to sell their produce. Overall 80 farmers from both the district 41.25 per cent of farmers travel more than 15 km to sell their produce through ReMS in APMCs.

8. As high as 47.50 per cent of the Davanagere farmers were having medium level of risk orientation, while 27.50 and 25.00 per cent of the farmers were having low and high level of risk orientation, respectively. 42.50 per cent of the Chamarajanagara farmers were having medium level of risk orientation, while 32.50 and 25.00 per cent of the farmers were having high and low level of risk orientation, respectively.

9. 45.00 per cent of the Davanagere farmers were having medium level of marketing orientation, while 32.50 and 22.50 per cent of the farmers were having high and low level of marketing orientation, respectively. 40.00 per cent of the Chamarajanagara farmers were having medium level of marketing orientation, while 35.00 and 25.00 per cent of the farmers were having high and low level of marketing orientation, respectively.

10. Two-fifth of the Davanagere farmers (40.00%) were having high level of innovative proneness, followed by 35.00 and 25.00 per cent of the farmers were having low and medium level of innovative proneness, respectively. More or less similar results were observed from farmers of Chamarajanagara where 42.50 per cent were having medium level of innovative proneness, followed by 30.00 and 27.50 per cent of the farmers were having high and low level of innovative proneness, respectively.

11. A good number of Davanagere farmers (42.50%) were belonging to high category of information seeking behaviour and 30.00 per cent of the farmers were belonging to low category of information seeking behaviour. Whereas, more than two-fifth (45.00%) of Chamarajanagara farmers were belonging to high category of information seeking behaviour and 32.50 per cent of the farmers were belonging to medium category of information seeking behaviour. Considering 80 farmers from both the district 43.75 per cent of farmers were having high level of information seeking behaviour, while 30.00 and 26.25 per cent of farmers were having medium and low level of information seeking behaviour, respectively.

12. As high as 40.00 per cent of the Davanagere farmers were having medium level of achievement motivation, while 35.00 and 25.00 per cent of the farmers were having high and low level of achievement motivation, respectively. 40.00 per cent of the Chamarajanagara farmers were having medium level of achievement motivation, while 37.50 and 22.50 per cent of the farmers were having high and low level of achievement motivation, respectively.

13. With regard to level of education, 35 per cent of Davanagere traders were educated up to high school and equal per cent have an education level of pre-university. Where in Chamarajanagara district, 35.00 per cent of ReMS traders have an education level of Pre University.

14. 45.00 per cent of Davanagere traders have moderate level of trading experience followed by 40.00 and 15.00 per cent of traders have low and high level of trading experience, respectively. 35.00 per cent of chamarajanagara traders have moderate level of trading experience and have an equal level of less trading experience.

15. As high as 45.00 per cent of the Davangere traders were having high level of risk orientation, while 35.00 and 20.00 per cent of the farmers were having medium and low level of risk orientation, respectively. 40.00 per cent of the Chamarajanagra traders were having medium level of risk orientation, while 40.00 and 20.00 per cent of the farmers were having medium and low level of risk orientation, respectively. Considering 40 traders from both the district 42.50 per cent of traders were having high level of risk orientation.

16. 40.00 per cent of the Davanagere traders were having medium level of marketing orientation and 45.00 per cent of the Chamarajanagara traders were having medium level of marketing orientation. Considering 40 traders from both the district 42.50 per cent of farmers were having medium level of marketing orientation, while 35.00 and 22.50 per cent of traders were having high and low level of marketing orientation, respectively.

17. Half of the Davanagere traders (50.00%) were having medium level of innovative proneness, followed by 30.00 and 20.00 per cent of the traders were having high and low level of innovative proneness, respectively. More or less similar results were observed from traders of Chamarajanagara where 45.00 per cent were having medium level of innovative proneness, followed by 35.00 and 20.00 per

cent of the farmers were having high and low level of innovative proneness, respectively.

18. A good number of the Davanagere traders (40.00%) were belonging to medium category of information seeking behaviour and equal percentage (30.00) of traders were falling under the category of high and low information seeking behaviour. Same results were obtained from traders of Chamarajanagara district, which comprises exactly same results by 40 traders from both the districts.

19. Out of 9 items of e trade cent per cent of farmers of Davanagere were aware about electronic weighing machine followed by 87.50 per cent of them were receiving SMS after the sale of their produce. Farmers of Davanagere were not aware of lot entry Id generation (65.00%), assaying laboratory (90.00%), inventory update facility (95.00%), sale receipt facility (90.00%). Orientation and information centers (82.50%), electronic warehouse facility (90.00), and kiosk system usage (57.50%). And in e tender process majority of them were aware about bid management hall (95.00%), e auction process (80.00%), and highest bidder winning the price (92.50%) and bid results declaring at 1:30 PM (100.00%).

20. Chamarajanagara district where 85.00 per cent were aware about weighing machine and 90.00 per cent of the respondents were receiving SMS after the produce sale, followed by 62.50 per cent were aware about lot id generation process. ReMS farmers of Chamarajanagara was not aware about assaying laboratory (65.00%), inventory update facility (90.00%) and sale receipt facility (65.00%). Orientation and information centers (82.50%), electronic warehouse facility (62.50%), and kiosk system usage (75.00%). And in e tender process majority of them were aware about bid management hall (90.00%), e auction process (85.00%), and highest bidder winning the price (95.00%) and bid results declaring at 1:30 PM (100.00%).

21. The awareness level of Davanagere farmers about the e trading is low (42.50%) and only 22.50 per cent of respondents had high level of awareness. But 80.00 per

cent of the respondents had high level of awareness about e tender process. Which constitutes the medium level of awareness about overall ReMS trade process. In comparision Chamarajanagara farmers had medium level (42.50%) of awareness about e trade and high level (77.50%) of awareness about e tender.

22. Out of 15 items considered (11-e trade and 4- e tender), with this traders of Davanagere were cent per cent aware about unified license, post bidding SMS, and electronic weighment. Which is followed by e permit (95.00%), lot entry ID generation (90.00%), and electronic warehouse based sale (70.00%).

23. Traders of Chamarajanagara were cent per cent aware of unified license, post bidding SMS, and electronic weighment, electronic warehouse based sale and e permit. Which is followed by, lot entry ID generation (95.00%), and assaying laboratory (75.00%), kiosk system usage (75.00%), inventory update facility (75.00%) and sale receipt generation (80.00%).

24. Traders of Davanagere have low level (40.00%) of awareness about e trade process where as high (60.00%) awareness was observed about e tender process. Traders of Chamarajanagara have low awareness level ((35.00%) about e trade process where as high (65.00%) awareness was observed about e tender process. Overall awareness about trading practices followed in ReMS by 40 traders of Davanagere and Chamarajanagara was observed to be high level with 52.50 per cent.

25. The better perceived five items by farmers were Regularity in getting SMS after sale of the produce and online payment (I), Entire produce is sold same day(II), Transparency in report generation(III), Online method of payment is better than cash and cheque method(IV), Settlement of payment within 48hrs after the trading activities is achieved through ReMS trading (V).

26. The overall perception of Davanagere farmers about performance of ReMS trading is poor (55.00%). In case of Chamarajanagara district ReMS farmers had average perception (37.50%) about the functioning of ReMS. The results also

revealed that overall with 80 farmers from both the district have poor (43.75%) perception.

27. Considering overall 40 traders from both the district, perceived these five items of ReMS as better: Single unified license is better than previous licence method (I), Transparency has been increased after the introduction of e trading (II), No scope for price manipulation (III), Time available for e-bidding is sufficient (IV), Time available for e-bidding is sufficient (V).

28. The overall perception of Davanagere traders about performance of ReMS trading is better (45.00%). In case of Chamarajanagara district ReMS traders had better perception (37.50%) about the functioning of ReMS. The results also revealed that overall with 40 traders from both the district have better (45.00%) perception.

29. Whereas under e tender, overall by 80 farmers, infrastructures like bid management hall (88.75%), e auction process (71.25%), highest bidder will win the prize (87.50%) were utilized.

30. Medium level (37.50%) of ReMS infrastructures have been utilized by Davanagere farmers. The same pattern of utilization of infrastructures was observed from Chamarajanagara farmers with medium level (52.50%) of utilization. The pattern of ReMS infrastructure utilization from 80 farmers of both the district were categorized as medium (45.00%) level.

31. It is perceptible that high level (40.00%) of ReMS infrastructures have been utilized by Davanagere traders. The same pattern of utilization of infrastructures was observed from Chamarajanagara traders with high level (45.00%) utilization. The pattern of ReMS infrastructure utilization from 40 traders of both the district were categorized as high (42.50%) level.

32. 2.53 per cent of price have been realised by paddy farmers of Davanagere. 4.70, 0.707, 6.99 per cent of price realised by ground nut, areca nut and turmeric farmers, respectively.

33. Education, land holding, marketing orientation, risk orientation and achievement motivation of farmers had positive significant relationship with the farmers awareness level on ReMS trading at one per cent level of significance, variables like innovative proneness and information seeking behaviour have positive significant relationship with the awareness level of farmers on ReMS trading at five per cent level of significance. Whereas, age of farmers have negative significant relationship with awareness level at one per cent level of significance.

34. Trading experience and information seeking behaviour of traders have positive significant relationship with awareness level of traders on ReMS trading at one per cent level of significance. And marketing orientation considered to have positive significant relationship at five per cent level of significance.

35. Education and risk orientation of farmers have highly significant relationship at one per cent level of significance with farmers' perception level about the functioning of ReMS. Land holding, marketing orientation, information seeking behaviour, achievement motivation and innovativeness significant relationship at five per cent level with their perception about the functioning of ReMS.

36. Education, trading experience and information seeking behavior of traders have positive significant relationship with perception level of traders about performance of ReMS trading practices at one per cent level of significance. Whereas marketing orientation is positively significant at five per cent level of significance.

37. Education and information seeking behaviour of farmers have significant relationship at five per cent level with extent of utilization of infrastructures created through ReMS. Risk orientation is highly significant at one per cent level of significance.

38. Education, trading experience and information seeking behavior of traders have positive significant relationship with extent of utilization infrastructures created through ReMS by traders at one per cent level of significance.

39. The major problems enlisted by farmers were Lack of Computer Knowledge (I), Lack of Understanding of the entire UMP process (II), Non availability of market information and price information (III), No proper knowledge regarding grading and standardization (IV), Delay in market process (V).

40. The problems enlisted by the traders in ReMS application performance were, Electronic system does not work (I), Poor net connectivity (II), Grading facilities are not adequate (III), Trust issues about quality of the produce (IV), Difficulty in understanding whole UMP (V).

41. Some of the suggestions offered by farmers were Provision of Computer education (I), Awareness programmes about ReMS (II), Simplification of UMP process (III), Provision of timely market information (IV), Help desk (V).

42. Some of the suggestions offered by traders were removing glitches in the ReMS application (I), Strong Internet connectivity (II), Proper grading and standardization of agricultural produce (III), Simplification of UMP process (IV), Guidance or help desk (V).

Policy implications of the study

- There needs to conduct more number of awareness programmes about the trading process followed in ReMS for the maximum outreach in rural areas. Government of Karnataka has to undertake training on computer literacy for farmers to provide introductory level computer knowledge. ReMS has to undertake campaigns regarding e trade for the fast dissemination and adoption of the services.

- All the assaying laboratories has to be provided with commodity specific quality parameter analysis equipment's for the better assayed results. Which results directly in improving quality of the produce brought to the APMC yard. Karnataka government needs to look in to implementation of commodity specific assaying laboratories.

- Recruitment of qualified personnel as lab technicians to test produce quality. Where the qualified personnel will help in better assessment and getting accurate results.

- Installing a help desk or recruiting a guide in every APMCs to assist the farmers as well as traders to take up the e trade smoothly and also to reduce time element in e trading.

- There is a lot scope for forming farmers in to collective groups such as SHGs or FPOs so that they can undertake grading and standardization in collective basis since, grading and standardization is costly at individual basis. The very good graded and standardized quality produce have potential to attract international markets.

- Post-harvest activities needs to be implemented by setting up of proper infrastructures which can decrease the loss of agricultural produce post-harvest losses. Strong public private partnership (PPP) mode can be utilized for successful installation and management activities.

- End-to-end computerization of the process is suggested to improve marketing efficiency. Where farmers and traders builds a motive of trust and chances of participation in e trading can be increased.

- Linkages should be developed across different regulated markets for improving competition, expanding market opportunities and providing better prices to farmers. Where the traded volume and increased competition are likely to increase the remuneration for farmers.

- There needs to undertake proper invigilation and follow up procedure to keep all the e trade activities in line and to get timely updates about the performance of ReMS. And there is a need for quarterly or half yearly evaluation to get the progress status of ReMS.

- Inventory update by every trader and DCB (demand and balance) settlement by every APMCs settlement every day needs to be updated. which gives the overall inventory available in Karnataka which can help in taking up any developmental activities.

Suggestions for future line of work

The present study provides an insight about the awareness, perception and extent of utilization of infrastructures in ReMS trading processes by farmers and traders, but the study was restricted only to Davanagere and Chamarajanagara district. Future studies can be undertaken covering more districts to give better results. And lot of scope is there to conduct crop specific study. Further line of study can include areas like performance of ReMS, impact of ReMS trading in increasing farmer income, influence of ReMS trading in doubling farmers' income. Participation of small farmers in e trading is less and the line of work can be undertaken to know the reasons and problems faced by them in utilizing the services of ReMS.

VI REFERENCES

AMARENDER REDDY, A., 2016, Impact of e-markets in Karnataka, *Ind. Jour. Agril. Mktg,***30**(2), 2016.

AMRUTHA, T., JOSHI, SIDDAYYA AND REDDY VIJAYACHANDRA, S., 2015, A study on use of electronics and communication technologies (ECTs) in agricultural marketing in NEK region. *Indian J. of Economics and Development*. **3**(2): 155- 160.

ANANDARAJA, N., 2002, Developing Farmer Friendly Interactive Multimedia Compact Disc and Testing its Effectiveness in Transfer of Farm Technology. *Ph.D. Thesis* (Unpub.)*,* TNAU, Coimbatore.

ANITA, D., SANDEEP, K. AND MUKESH, K., 2011, Physical Infrastructure Facilities for Agricultural Marketing in Haryana: A Case Study of Sirsa District,*www.ijrcmorg.in.,***1**(3): 2231-4245.

ASHA, A., 2015, A study on the performance of Self Help Groups in Ramanagara District of Karnataka, *M.Sc. (Agri) Thesis (Unpub.),* Univ. Agric. Sci., Bangalore

AVINASH, T. S., 2013, Perception of farmers about functioning of Raitha Samparka Kendras in Dharwad district of Karnataka, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Dharwad

BARMAN, K AND NAMITA DEVI, 2004, Infrastructure of Agricultural Marketing: A Study of Three Regulated Markets in Assam, *Indian J. of AgriculturalMarketing,* **18**(3): 79.

CHAHAL, S., S AND KATARIA, P., 2008, Impact Analysis of Infrastructure and Incentives on Trade in Regulated Markets of Punjab, *Agriculture Update,* **3**(3 & 4): 373-378.

CHANDRAVADIYA, K.U., 2009, Role of SHG for empowerment of women, *M.Sc. (Agri.) Thesis (Unpub.),* Jungadh Agricultural University, Junagadh

CHENGAPPA, P.G., ARUN, M., C.G., YADAVA AND PRASANNA KUMAR, H.M., 2012, IT Application in Agricultural Marketing Service Delivery - Electronic Tender System in Regulated Markets. *Institute for Social and Economic Change*, **25**:359-372.

CHHODAVADIA HARSHADBHAI CHHAGANBHAI, 2016, Impact of Improved varieties on Livelihood on Farmers of KVK Adopted Villages in Saurastra Region of Gujarath, *P.hD. Thesis (Unpub.),* Jungadh Agricultural University Jungadh, Gujarath.

CHULEEPORN CHANGCHIT, 2006, Consumer perceptions of online shopping in Texas (USA), *Issues in Information System J.,* **7**(2): 179-181.

DILEEP KUMAR, K.N., 2016, Awareness, perception and constraints implementing copra and turmeric trade under Unified Market Platform. *M.Sc. (Agri.) Thesis* (Unpub.), Univ. Agri. Sci., Bengaluru.

DEVALATHA, C. M., 2005, Profile study of Women Self-Help Groups in Gadag District of Northern Karnataka, *M.Sc. (Agri.), Thesis (Unpub.),* Univ. Agric. Sci., Dharwad

FAHAD ALDOSARI AND MEHMOOD ALI NOOR, 2017, Farmers perceptions regarding the use of information and communication technology (ICT) in Khyber pakhtunkhwa, Northern Pakistan, *J. of the Saudi Society of Agricultural Sciences.*

GIRISH, S. S., 2017, A study of e-tendering system and its impact on arrivals and prices of Bengal gram in Karnataka, *M.Sc. (Agri.) Thesis* (*Unpub*.), Banaras Hindu University.

GOPALA, Y. M., 2010, Knowledge and Adoption of Participant and Non- Participant Maize growers of Farmers Field Schools in Chickaballapura District of Karnataka*, M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Bangalore

GOWDA GOVINDA, V., SHIVANI DECHAMMA, AND SHANABHOGA, M.B.,2015, Socio- Economic Profiling Of Tumkur District Farmers In Karnataka, *Intl. J. of Science and Nature*, **6**(1): 97-102.

HEHLANGKI TYNGKAN., 2018, Impact of electronic National Agriculture Market (eNAM) on the income of farmers in Raipurand Dhamtari Agricultural produce Market Committee (APMCs) of Chattisgarh, *M.Sc. (Agri) Thesis (Unpub.),* Indira Gandhi Kirshi Vishwavidyalaya Raipur.

IRENE TERESIA MUATHA, DAVID JAKINDA OTIENO AND ROSE ADHIAMBO NYIKAL, 2017, Determinants of smallholder farmers' awareness of agricultural extension devolution in Kenya. *African J. of Agricultural Research,* **12**(51): 3550-3555.

JAYASRI, R., 2014, Farmers awareness and perception on commodity futures market- A study with special reference to cardamom planters in Tamil nadu, *Ph.D. Thesis* (*Unpub*.) University of Madras, Chennai.

JOHN, F. KIRCHOFF, AND CHRIS KOCH, 2011, Stakeholders perceptions of green marketing, *Intl. J. of Physical Distributors and logistics Management*, **4** (1): 684-696.

JUDITH SINJA, ISABELLE BALTENWECK, LISTEN NJOROGE AND DANNIE ROMNEY, 2006, Milk market access for smallholders: A case study of informal milk trader groups in Kenya, Wagenigen University and Research.

JYOTHI, L. N., 2011, Role of NCDEX spot exchanges Ltd. (NSPOT) in tur marketing in Gulbarga district: An econometric analysis, *MBA Thesis* (*Unpub*.), Univ. Agric. Sci., Dharwad.

KASHEM, M.A., 2010, Farmers' Use of Mobile Phones in Receiving Agricultural Information towards Agricultural Development, Bangladesh Agricultural University Professor. *Dept. of Agrl. Extension Education*.Mymensingh, Bangladesh.

KIRAN, T.R., 2007, Perception of organizational climate by scientists of Univ. Agric. Sci., Dharwad, *M.Sc. (Agri.) Thesis (Unpub.)*, Univ. Agric. Sci., Dharwad.

KENCHANAGOUDRA, S. M. (2007). An analytical study on Sampoorna Grameen Rozgar Yojana (SGRY) in Gadag district of Karnataka State. *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad, Karnataka (India).

KERLINGER, F.N., 1973, *Foundation of behavioural research,* Halt Rinehart and Winston Inc., New York.

KRISHNAMURTHY, R., 2000, Indian Rural Market: Problems and Prospects, *Indian Management*, **39**(10): 52.

KUBOYE, B.M. AND OGUNJOBI, S.B., 2013, E-Marketing for Nigeria Agricultural Products, *J. Inn. Res. In Eng. And Sci.,* **4**(2): 53-67.

KUMAR, K., AMBARISH, JORDAN, B.B. AND BARKER TANSU, A., 1987, Made in India: What it means to Indian consumers, *Indian J. Marketing,* **17**(9): 26-34.

KUMAR, S., 2009, Technological gap in adoption of improved cultivation practises by the soybean growers, *M. Sc. (Agri.) Thesis*, Univ. Agric. Sci., Dharwad, Karnataka (India).

LAKSHMI DHAR HATAI AND DEBASHISH PANDA, 2015, Agricultural Marketing information System- A case study of Traders in Meghalaya, *Economic Affairs,* **60**(2): 23-271.

LAVANYA, B. T., 2010, Assessment of farming system efficiency in Theni District of Tamil Nadu, *M.Sc.(Agri.)Thesis (Unpub.),* Univ. Agril. Sci., Bangalore.

LAXMI THAKUR, 2012, Impact of Vocational Training Programme on income generation and employment generation organized by Krishi Vigyan Kendra Narsingh Pura, Madhya Pradesh, *M.Sc. (Agri.) Thesis (Unpub.),* Jawaharlal Nehru Krishi Vishwa Vidyala, Jabalpur, Madhya Pradesh.

LOPAMUDRA SAHU, 2016, Impact of KVK Training Programme on the Farm Women of Kandhamal District, *M.Sc. (Agri.) Thesis (Unpub.),* Orissa University of Agriculture and Technology, Bhubaneswar.

MADAN MOHAN REDDY, K., SREENIVASA RAO, I., SRINIVASULU, M., AND SATISH KUMAR, G.D., 2017, Perception and Usefulness of Mobile Phone Based Agro-Advisories, *Int. J. Curr. Microbiol. App. Sci,***6**(7): 866-872.

MARC, J. EPESTEIN AND KRISTI YUTHAS, 2012, Evaluating the effectiveness of Internet Marketing Initiatives. *Society of Management Accountants of Canada*. **9**(1):137-148.

MOHAMEDYUNUS, A., 2014, Customer Perception, Awareness and Satisfaction towards Online Shopping - A study with reference to Chennai city', *Indian J. of Marketing*, **2**(1): 22.

MONICA CHATURVEDI.**,** 2011, A study on Women Empowerment through Vocational Training programme organized by Krishi Vigyan Kendra Jabalpur, *M.Sc. (Agri.)* Thesis *(Unpub.),* Jawaharlal Nehru Krishi Vishwa Vidyala, Jabalpur, Madhya Pradesh.

MOULIK, T. K. AND RAO, C. C., 1965 Self Rating Scale For Farmers : Measurement in Extension Research. New Delhi

MUNDAR RAM, 1999. Agricultural Marketing: Issues and Challenges, *Agricultural Marketing*, **XVI** (4).

NAHATKAR, S.B., KIRADIYA, B.S AND SHARMA, H.O., 1998. Price Variation of Cotton: A Case Study of Kukshi Regulated Market of Dhar District of Madhya Pradesh, *Indian J. of Agricultural Economics*, **53**(3): 378.

NAGESH, 2006, Study on entrepreneurial behaviour of pomegranate growers in Bagalkot district of Karnataka, *M.Sc. (Agri.) Thesis* (*Unpub*.), Univ. Agric. Sci., Dharwad.

NAIN, M.S., RASHMI SINGH AND MISHRA, J.R., 2017, A Study of Farmers' Awareness on Agricultural Insurance Schemes in Southern Haryana, *Indian J. of Extension Education*, **53**(4): 75-79.

NARAYANASWAMY, B., 2005, Performance of Self-help Groups in Karnataka-An Analysis, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Bangalore.

NAVEENKUMAR, P., 2012, Entrepreneurial behaviour of pomegranate farmers in Chitradurga district of Karnataka, *M.Sc. (Agri.) Thesis* (*Unpub*.), Univ. Agric. Sci., Bangalore.

NEELAMMA R. KOLAGERI AND BASAVARAJ BANAKAR**,** 2018**,** Awareness of e tendering and e-trading among the farmers and market functionaries in the agricultural produce market committees (APMCs) of Karnataka, *Int. J. Pure App. Biosci.***6 (4):** 363-369.

OYESOLA, O.B., 2007, Rural dwellers perception on effect of infrastructural facilities on livelihood activities in Akinyele Local Government Area of Oyo State, Nigeria, *Journal of Economics and Rural Development,***16** (1): 83-92.

PANT, D.C., BURARK, S., S AND BAJROLIA, M. L., 2004, Utilization of Infrastructural Facilities of a Primary Regulated Market in Nagaur District, *Indian J. of Agricultural Marketing,* **18**(3): 90.

PARMAR VIRENDRAKUMAR SOBANBHAI, 2014, Knowledge and Attitude of farmers towards the Use of Kissan Call Centre in South Gujarat Region, *M.Sc. (Agri.) Thesis (Unpub.),* Navasari Agricultural University, Navasari, Gujarat.

PATEL, B., 2015, A study on utilization pattern of communication channels by the farmers of Sehore block of Sehore district, Madhya Pradesh, *M.Sc. (Agri.) Thesis (Unpub.),* Rajmata Vijayaraje Scindia Krishi Vishwa, Vidyalaya, Gwalior.

PRIYANKA, 2017, Attitude of agricultural students towards computer usage, *M.Sc. (Agri.) Thesis (Unpub.),* V.N.M.K.V., Parbhani.

PAVITHRA, K AND MAHANTESH R., NAYAK, 2018, Benefits and Perception of Dry Chilli Farmers in Online Marketing: Experiences from Karnataka State, India, *Asian J. of Agricultural Extension, Economics & Sociology*. **28**(4): 1-9.

PAVITHRA, S., GRACY, C, P., RAKA SAXENA AND GANESH GOWDA PATILA, 2018, Innovations in agricultural marketing: a case study of e-tendering system in Karnataka, India, *Agricultural Economics Research Review*,**31** (1), 53- 64.

POOJA PATEL, PATEL, M. M., BADODIA, S. K. AND PRABHAKAR SHARMA, 2014, Entrepreneurial behaviour of dairy farmers. *Ind. Res. J. Extn.Edu*., **14** (2):46-50.

PRADEEP YADAV, 2012, Perception of the Member Farmers of Gram Panchayat about Farm Television, *M.Sc. (Agri.) Thesis (Unpub.),* Anand Agric. Univ., Anand.

PRAKASH, S., TAMAGOND, 2013, Role perception and role performance of farm facilitators under Bhoochetana programme and their personal characteristics, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Dharwad, Karnataka.

PRIYANKA CHOWDHURY, 2014, Impact assessment of Training Programmes on Fish Production imparted by KVK Sonamukhi, Bankura, *M.Sc. (Fishery)Thesis (Unpub.)*, West Bengal University of Animal and Fishery Sciences.

RAJPUT RUDRADATSINH PRATAPSINH, 2016, Impact of training imparted by KVK on Knowledge and Adoption of the Beneficiaries about IMP in Cumin, *M.Sc. (Agri.) Thesis (Unpub.),* Jungadh Agricultural University Jungadh, Gujarat.

RAKSHA, I., SREENIVASA RAO AND SHAIK N. MEERA, 2015, Determinants of ICTs in agricultural extension system, *Indian Res. J. Ext. Edu*., **15** (1): 56-59.

RAMESH SAFARE, BALAJI PRASAD. P, AND AZASH, S., 2015, Role of market yard infrastructure facilities on agricultural producers: A case study of Kurnool Market Yard, *Int. J. Managerial Studies and Res.,* **9** (3): 137-141.

RAVI KUMAR, K.N., SREE LAKSHMI, K AND RAJU, V.T., 2001, Trends in Arrivals and Prices of Selected Commodities in Anakapalle Regulated Market, *J. of Institute of Economic Research*, **23:** 41-48.

RAO, V. G. K., 1985, A prediction analysis of farming performance of farmers through their entrepreneurial behavioural factors. *Ph.D. Thesis (Unpub.),* Andhra Pradesh Agricultural University, Hyderabad

REBECCA DAVIES AND CUNNINGHAM STUART, 2012, A Review of Online Trading and User Perceptions of Usability and Trust, *J. of Advanced Internet of Things*. **1**(4): 34-38.

RENUKA, 2017, A study on customer awareness towards online trading, *Anveshana's intl. j. of research in regional studies, law, social sciences, journalism and management practices,***2**(3): 2455-6602.

RIYAJUDDIN, 2005, Role of Online communication in Technology dissemination.*Ph.D. (Agri.) Thesis* (Unpub.), Chandra Shekhar Azad University of Agriculture and Technology, Kanpur.

RUPENDRA KUMAR, CHANDAN KUMAR, N. K., KUSHWAHA U. C., SHARMA AND AMIT SINGH, 2017, Social Profile of Self Motivated ICT farmers in Bhind District Madhya Pradesh, *M.Sc. (Agri.) Thesis* (Unpub.), Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya Krishi Vigyan Kendra, Lahar.

SAHANA, 2003, A Study on knowledge and attitude of farmers and extension personnel towards functioning of RSKs in Shimoga district, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Bangalore.

SAKTHIVEL, N AND SELVARAJ, A., 2009, Farmers' Perception towards Regulated Markets: A Case Analysis, *Financing Agriculture: A National J. of Agriculture and Rural Development,* **1**(2): 6-12.

SANGAPPA, 2012, Performance of gender specific Self Help Groups in Bidar district of Karnataka: A comparative analysis, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Bangalore.

SAMSON KATENGEZA, P., JULIUS JUMA OKELLO AND NOEL JAMBO, 2014, Use of Mobile Phone Technology in Agricultural Marketing: The Case of Small holder Farmers in Malawi, *Intl. J. of ICT Research and Development in Africa*. **4**(1): 1-3.

SATISH G. ATHAWALE, 2014, APMC and E-trading for Financial Inclusiveness in Karnataka, *J. of Management and Research*. **3**(2): 2277-7830.

SHAKEEL-UL-REHMAN AND SELVARAJ, 2013, Determinants of Farmers Perception towards Regulated Agricultural Markets in Salem District, *Life Science J.*, **1**(02): 466-2474.

SHANKARAIAH, N. AND NARAYANA SWAMY B. K., 2012, Attitude of Farmers and Scientists towards Dissemination of Technologies through Mobile Message Service (MMS), *J. of Tropical Agricultural Research,* **24** (1): 31-41.

SHANTHAMANI, 2007, A critical analysis of MYRADA (NGO) programme in Gulbarga district, *M. Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Dharwad

SHARMA AMOD, VENGOTO VENYO AND JITENDRA CHAUHAN, 2014, Entrepreneurial behaviour of potato growers in Kohima district of Nagaland,*Ind. Res. J. Extn.Edu.,* **14**(2): 82-87.

SHARMA, S. K., 2006, Study on functioning of Kisan Seva Kendras in Udaipur District of Rajasthan, *M. Sc. (Agri.) Thesis(Unpub.),* Univ. Agric. Sci., Dharwad

SHUWA, M.I., SHETTIMA, L., MAKINTA B.G., KYARI, A., 2014, Impact of Mass Media on farmers agricultural production, case study of Borno state, Agricultural Development Programme, *Academia J. of Scientific Research,* **3**(1): 008-014.

SIMPSON, M. AND DOCHERTY, A.J., 2004, E-commerce adoption support and advice for UK SMEs, *J. Small Busi. And Enterprise Development,* **11**(3): 315-328.

SINGH RAKESH., ARPITA GANGWAR., RAKA SAXENA., AND O.P., SINGH, 2017, Impact of Market Reforms on Agricultural Growth: A Case of Uttar Pradesh. *Indian j. of Agricultural Economics*.160-169.

SIVANARAYANA, G., RAMADEVI, M. AND VENKATARAMAIAH, P., 2008, Awareness and Adoption of Cotton (*Gossypium Lirsutum* L.) Integrated Pest Management Practices by the farmers of Warangal District in Andhra Pradesh. *The Journal of Research,* ANGRAU, Hyderabad.**36** (4): 33 – 40

SUBHASH CHAND, 2012, Perception of the farmers towards the technical capability of Public Extension Personel, *M.Sc. (Agri.) Thesis (Unpub.),* Anand Agril. Univ., Anand.

SULAIMAN UMAR, MICHAEL WAMDZU MUSA, YETUNDE TOLUWASE OLAYEMI AND RABIU SULEIMAN, 2015, Awareness and use of information and communication technologies among extension agents in Kaduna state of Nigeria, *J. Agri. Extension,* **19** (1): 66-77.

SUNIL VASANT MORE, 2014, Perception of the Beneficiaries about Farmers Field School Programme in Konkan Region of Maharasthra*, M.Sc (Agri.) Thesis (Unpub.),* Dr Balasaheb Sawant Konkan Krishi Vidyapeeth., Dapoli

SUNITHA, A. B., 2012, A Comparative Study on Performance of Participant and Non Participant Farmers of Farmers field School (FFS's) in Bangalore Rural District, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Bangalore.

SUPE, S. V., 1969, Factors related to different degrees of rationality in decision making among farmers in Buldana district. *Ph.D. Thesis (Unpub.),* IARI, New Delhi.

SURESH, 2004, Entrepreneurial behaviour of milk producers in Chittoor district of Andhra Pradesh – A critical study, *M.V.Sc. Thesis (Unpub.),* Acharya N. G. Ranga Agricultural University, Hyderabad.

SUSHMA, K. C., 2007, An analysis of entrepreneurship development in women through training, *M.Sc. (Agri.) Thesis (Unpub.),* Univ. Agric. Sci., Dharwad

SWAGATIKA S. I., 2011, Impact of Krishi Vigyan Kendra among farming community of Khurda District, *M.Sc. (Agri.) Thesis (Unpub.),* Orissa University of Agriculture and Technology, Bhubaneswar.

ULRICH KLEIH, GEOFREY OKOBOI AND MONICA JANOWSKI, 2004, Farmers and Traders sources of Market information in Lira district, NARO conference, Natural Resources Institute, University of Greenwich, United Kingdom.

VIJAYKUMAR, K., 2011, Study on entrepreneurial behaviour of silk worm seed producers. *M.Sc. (Agri.) Thesis* (*Unpub*.), Univ. Agric. Sci., Bangalore.

YADAV, S. S., 2001, A Study On Impact Of Front Line Demonstration On The Knowledge And Adoption Of Improved Varieties Of Chickpea, *M.Sc. (Agri.) Thesis (Unpub.),* R.A.K College Of Agriculture, Sehore.

UNIVERSITY OF AGRICULTURAL SCIENCES
DEPARTMENT OF AGRICULTURAL EXTENSION, GKVK
BANGALORE-65

Analysis of online trading through Rashtriya Electronic Market Services in Karnataka

Schedule for Data Collection

PART- A

(Farmers)

1. Name of the farmer	
Contact .No	
Age(years)	
Gender	Male/Female
Taluk	
Education	Illiterate/ Primary school/ Middle school/ Highschool/ Pre-university/Graduate./Any other
family size (No. of family members)	

2. Land Holding

Sl. No.		
1	Irrigated	
2	Dry	
3	Garden land	
4	Total	

3. Farming experience (Years): _____

4. Marketing experience in UMP (Years): ----------

5. What is the distance from APMC to home?

a)5 Km b) 5-10 Km c) 10-15 d) >15

7. Risk orientation

Please indicate your option to the following statements by marking (√)

Sl. No	Statements	Response pattern		
		A	UD	DA
1	A farmer should grow more number of crops to cope up with price fluctuation in the markets.			
2	A farmer should rather take more of chance in making big profits than to be content with a smaller but less risky profits.			
3	A farmer who is willing to take greater risks than the average farmer usually does better financially.			
4	It is good for a farmer to take risk when he/she knows his/her chances of success is high in adopting improved marketing practices.			
5	It is better for a farmer not to try new marketing practices unless most others have used them successfully.			
6	Trying of entirely new method in marketing by a farmer involves risks but it is worthy.			

A=Agree UD=Undecided DA=Disagree

8. Marketing orientation

Please indicate your option to the following statements by marking (√)

Sl. No.	Statements	SA	A	UD	DA	SDA
1.	One should grow those crops, which have more market demand.					
2.	Market news is not so useful to the farmers					
3.	A farmer can get good price by grading his produce					
4.	Warehouse can help the farmer to get better prices for his produce.					
5.	One should purchase inputs from the shop where price is relatively low					
6.	One should sell his produce to the nearest market irrespective of price					

SA= Strongly agree, DA=Disagree, A=Agree, UD=Undecided,

SDA=Strongly disagree

9. Information seeking behavior

Please indicate your option to the following statements by marking (√)

Sl. No.	Information sources	Degree of contact			
		Frequently	**Occasionally**	**Rarely**	**Never**
I.	**Informal sources**				
1.	Family members				
2.	Friends/ relatives				
3.	Neighbor's				
4.	Progressive farmers				
II.	**Formal sources**				
5.	Panchayat Members				
6.	RSK/ KSDA				
7.	Scientists from SAU's				
8.	Agro input agencies				
9.	Bank officials				
10.	Krishi Maratha Vahini				
11.	APMC display board				
12.	Others				
III.	**Mass media**				
13.	News papers				
14.	Radio				
15.	Television				
16.	Farm literature				
17.	Film shows				
18.	Others				

10. Achievement motivation

Please indicate your option to the following statements by marking (√)

Sl. No	Statement	Response				
		SA	A	UD	DA	SDA
1	Work should come first even if one cannot get proper rest in order to achieve goal					
2	It is better to be content with whatever little one has than to be always struggling for more					
3	No matter what I have done I always want to do more					
4	I would like to try hard at something really difficult even if it proves that I cannot do it					
5	The way things are now discourage one to work hard					
6	One should succeed in one's occupation even if one has to neglect his family					

SA–Strongly Agree, A–Agree, UD–Undecided, DA–Disagree, SDA–Strongly Disagree

11. Innovative proneness

Please indicate your option to the following statements by marking (√)

Sl No.	Statements	SA	A	DA
1	I search for different sources of information on new farm technology in the quickest possible time.			
2	I am eager to try or adopt new farm technology that I have heard.			
3	I do not want to be first to adopt new farm technology in my community			
4	I feel that, adoption of latest farm technologies has lead to better living conditions.			
5	I do not wait to see the results of my neighbors before I try out new technologies.			
6	I do not believe that the modern ways of farming is best			
7	I am optimistic in adopting the innovations even in the event of failure			
8	I think it is the waste of time to keep on trying new practices			
9	I adopt innovations to augment my profits in competition with my fellow members			
10	I try to catch new technologies because it may help me to keep up my status in society as a progressive individual			
11	I hesitate to take advice from others in my farming			
12	If anybody knows better than me any new technology.I respect them.			
13	I think that, any new technology is impracticable			

SA–Strongly Agree, A–Agree, DA–Disagree

12. Price pattern

Type of produce sold	Qty. sold	Grade	Price realised per quintal

PART- B

Awarenes

Please indicate whether you are aware of the following trading practices ReMS by marking (√)

Particulars	Aware	Not aware
Pre cleaning equipment		
Grading facility		
Lot entry ID generation		
Electronic weighment		
Assaying laboratory		
Inventory update facility		
Sale receipt generation		
Bid management		
E-auction		
Highest bidder will win the prize		
Bid results declared at 1:30 PM		
Post bidding Price information sent to farmers through SMS		
Grain storage		
Soil testing		
Orientation and information centres		
Cold storage		
Warehouse based sale		
Kiosk system usage		

Extent of Utilization of Infrastructure

Please indicate the extent of utilization of infrastructures utilized at ReMS by marking (√)

Particulars	Fully utilized	Partially utilized	Not utilized
Cleaning yard			
Sorting yard			
Drying facility			
Grading facility			
Lot entry ID generation			
Electronic weighment			
Assaying laboratory			
Inventory update facility			
Sale receipt generation			
Bid management hall			
E-auction on UMP			
Computerized settlement slip generation			
Orientation and information centres			
Grain storage			
Soil testing			
Cold storage			

Perception

Please indicate the perception about performance of ReMS by marking (√)

Sl. No.	Particulars	A	UD	DA
A.	**Purpose of using ReMS**			
1.	ReMS application is used only to check prices and it is easier			
2.	ReMS application is used for price checking and sale of the produce			
3.	ReMS application is used for price checking, sale and online payment and it is easier			
4.	ReMS trading is better than the conventional trading			
C.	**Features of the ReMS application**			
5.	ReMS application is user friendly			
6.	Regularity in getting SMS after sale of the produce and online payment			
7.	Transparency in testing quality of the produce and uploading the information in to the website			
8.	Very stringent in rating the specific quality parameters of the agricultural produce			
9.	Transparency in report generation			

D.	**Method of payment**			
10.	Online method of payment is better than cash and cheque method			
11.	Receiving payment directly from the trader helped in increasing the transparency			
12.	Settlement of payment within 48hrs after the trading activities is achieved through ReMS trading			
E.	**Overall performance**			
13.	Higher price realization through e-trading			
14.	Low marketing cost in e-trading			
15.	Sale process is less complicated			
16.	Better facilities for knowing the quality of the produce			
17.	Entire produce is sold same day			
18.	Satisfaction being part of Unified market platform			

A= Agree **UD= Undecided** **DA= Dis Agree**

Constraints faced by the farmers in UMP trading

Please indicate your ranking preference by giving ranks like 1,2….

Sl. No.	Factors	Ranking
1.	Lack of Computer Knowledge	
2.	Delay in settlement of payment	
3.	Lack of Understanding of the entire UMP process	
4.	Non availability of market information	
5.	No proper knowledge regarding grading and standardization	
6.	Non availability of proper storage facility in market yard	
7.	Rejection of commodity by trader due to quality issue	
8	Power shortages	
9	Poor internet connectivity	
10	Non availability of support staff	
11	Labour shortages for Loading, unloading etc.	
12	Any other specify a) b) c)	

Feedback for Improvement of UMP Trading: ----------

UNIVERSITY OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EXTENSION,

COLLEGE OF AGRICULTURE, GKVK, BANGALORE-65

Analysis of online trading through Rashtriya Electronic Market Services in Karnataka

Questionnaire

(Traders and Commission agents)

1. Name:_____

2. Contact No: _____

3. Trader ☐ Commission Agent ☐

4. Education: Illiterate/ Primary school/ Middle school/ High school / Pre-university/ Graduate./Any other

5. Market Name: _____

6. Shop Name: _____

7. No. of Markets you operate : _____ 7.1 No. of years of trading experience:-------

8. Commodities traded----------

Particulars	**Average Quantity/day**		**Price**	
	Peak Season	**Lean season**	**Peak Season**	**Lean season**
Commission collected				
Procurement place				

9. Do provide any assistance for farmers? Yes / No

If yes:

Sl NO	Particulars	No of Farmers	Amount/Farmer
1	Financial assistance		
2	Seed/Seedlings		
3	Fertilizer/Pesticide		
4	Transportation		
5	Other goodwill		

10. On what basis prices are fixed_____

11. What are the major reasons for price fluctuations?

_____

12. Mode of cash transaction:

Within what time the amount is paid to the farmers:

a. on spot ☐

b. one day ☐

c. Week ☐

13. Market information and intelligence gathering process_____

14. Trade purpose: export/ domestic

15. APMC cope up with peak arrivals: Yes/No

If Yes, how?

Risk orientation

Please indicate your option to the following statements by marking (√)

Sl. No	Statements	Response pattern		
		A	UD	DA
1	A farmer should grow more number of crops to cope up with price fluctuation in the markets.			
2	A farmer should rather take more of chance in making big profits than to be content with a smaller but less risky profits.			
3	A farmer who is willing to take greater risks than the average farmer usually does better financially.			
4	It is good for a farmer to take risk when he/she knows his/her chances of success is high in adopting improved marketing practices.			
5	It is better for a farmer not to try new marketing practices unless most others have used them successfully.			
6	Trying of entirely new method in marketing by a farmer involves risks but it is worthy.			

A=Agree UD=Undecided DA=Disagree

Marketing orientation

Please indicate your option to the following statements by marking (√)

Sl.No.	Statements	SA	A	UD	DA	SDA
1	One should grow those crops, which have more market demand.					
2	Market news is not so useful to the farmers					
3	A farmer can get good price by grading his produce					
4	Warehouse can help the farmer to get better prices for his produce.					
5	One should purchase inputs from the shop where price is relatively low					
6	One should sell his produce to the nearest market irrespective of price					

SA= Strongly agree, DA=Disagree, A=Agree, UD=Undecided, SDA=Strongly disagree

Information seeking behavior

Please indicate your option to the following statements by marking (√)

Sl. No.	Information sources	Degree of contact			
		Frequently	**Occasionally**	**Rarely**	**Never**
I.	**Informal sources**				
1.	Family members				
2.	Friends/ relatives				
3.	Neighbor's				
4.	Progressive farmers				
II.	**Formal sources**				
5.	Panchayat Members				
6.	RSK/ KSDA				
7.	Scientists from SAU's				
8.	Agro input agencies				
9.	Bank officials				
10.	Krishi Maratha Vahini				
11.	APMC display board				
12.	Others				
III.	**Mass media**				
13.	News papers				
14.	Radio				
15.	Television				
16.	Farm literature				
17.	Film shows				
18.	Others				

Innovative proneness

Please indicate your option to the following statements by marking (√)

Sl No.	Statements	SA	A	DA
1	I search for different sources of information on new farm technology in the quickest possible time.			
2	I am eager to try or adopt new farm technology that I have heard.			
3	I do not want to be first to adopt new farm technology in my community			
4	I feel that, adoption of latest farm technologies has lead to better living conditions.			
5	I do not wait to see the results of my neighbors before I try out new technologies.			
6	I do not believe that the modern ways of farming is best			
7	I am optimistic in adopting the innovations even in the event of failure			
8	I think it is the waste of time to keep on trying new practices			
9	I adopt innovations to augment my profits in competition with my fellow members			
10	I try to catch new technologies because it may help me to keep up my status in society as a progressive individual			
11	I hesitate to take advice from others in my farming			
12	If anybody knows better than me any new technology. I respect them.			
13	I think that, any new technology is impracticable			

SA–Strongly Agree, A–Agree, DA–Disagree

Awareness

Please indicate your option to the following statements by marking (√)

Particulars	**Aware**	**Not aware**
Unified licence		
Pre cleaning equipment		
Grading facility		
Lot entry ID generation		
Electronic weighment		
Assaying laboratory		
Inventory update facility		
Sale receipt generation		
Bid management hall		
E-auction facility		
Highest bidder will win the prize		
Bid results declared at 1:30 PM		
Post bidding Price information sent to farmers through SMS		
e- permit generation system		
Grain storage		
Soil testing		
Orientation and information centres		
Cold storage		
Warehouse based sale		
Kiosk system usage		

Extent of Utilization of Infrastructure

Please indicate your option to the following statements by marking (√)

Particulars	**Fully utilized**	**Partially utilized**	**Not utilized**
Cleaning yard			
Sorting yard			
Drying facility			
Grading facility			
Lot entry ID generation			
Electronic weighment			
Assaying laboratory			
Inventory update facility			
Sale receipt generation			
Bid management hall			
E-auction on UMP			
Computerized settlement slip generation			
e permit system			
Orientation and information centres			
Grain storage			
Soil testing			
Cold storage			

Electronic negotiable warehouse receipt is provided (E- NWR) - Yes/No

If yes,

A) What are the advantages?

1. Helped during distress sale
2. There are no chances of any tempering, mutilation, fudging, loss or damage of Warehouse Receipts.
3. Avoid multiple financing by Banks.
4. Facilitate an easy pledge financing by banks and other financial institutions
5. Get SMS after online payment?

B) How often do you use application :

a) once in a day b) once in 3 days c) once in a week d) once in a month e) other

C) Testing of quality parameters and report generation?

a) Transparent b) Not Transparent

Trader's perception on e- trading

Please indicate your option to the following statements by marking (√)

Attributes	A	UD	DA
Single unified license is better than previous licence method			
Training facilities on e-trading is adequate			
User friendly software			
Volume of produce for sale has increased			
Infrastructure for e- trading is sufficient			
Time available for e-bidding is sufficient			
Payment transaction time has reduced			
No technical constraints in using the ReMS application			
Online payment method is better than cash or cheque method			
Market integration and access to farmers has increased			
Availability of sufficient warehouse facility			
Can cope up with peak sale days			
Quality of the traded produce is increased			
No scope for price manipulation			
Market Competition has been increased due to e trading.			
Transparency has been increased after the introduction of e trading			
Export quality produce can be expected			
Satisfaction being the part of unified market platform			

A= Agree UD= Undecided

DA= Dis Agree

Constraints

Please indicate your ranking preference by giving ranks like 1,2….

Sl. No	**constraints**	**Ranking**
1.	No guidance or help desk	
2.	Electronic system does not work	
3.	Online payment process is difficult	
4.	Difficulty in getting single license	
5.	Poor net connectivity	
6.	Grading facilities are not adequate	
7.	Labour problem for loading	
8.	Trust issues about quality of the produce	
9.	No proper storage facility	
10.	Specify, if any	

Suggestions for improvement of online trading: ----------
