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"Agricultural Marketing – A Study On E-Marketing Challenges Faced By The Pomegranate Growers In Tumkur District"

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Abstract

According to the World Bank, agriculture serves as the mainstay of India's economy, constituting the primary source of income for 69 percent of its population. The present state of affairs within the nation is marked by a predicament faced by agricultural workers, leading to a significant upsurge in suicides throughout the country in recent times. To address the prevailing circumstances, it is imperative to instigate a transformative revolution in the field of agriculture. The marketing of agricultural products poses a substantial challenge for farmers, with the choice of marketing channels playing a pivotal role in determining the profitability of their endeavors. The objective of this study is to assess the extent of knowledge among pomegranate cultivators concerning marketing channels in the Tumkur district of Karnataka, and to provide suggestions based on the findings. Pomegranate cultivation is being conducted on a commercial scale in the Tumkur district. In the district, the cultivated land area dedicated to pomegranate cultivation measures 3328.10 hectares. The total production of pomegranates in this area amounts to 35.40 thousand tonnes, resulting in a productivity rate of 10.64 tonnes per hectare. The study area's pomegranate growers encountered significant marketing constraints, including price fluctuations in the market for their produce, a dearth of processing facilities, exorbitant transportation costs, inadequate compensation for pomegranate growers, and a scarcity of storage facilities. The farmers are not utilizing the e- market platforms. The least perceived limitations encompassed concerns regarding payment insecurity, the unavailability of skilled labor, and risk management. To optimize the value of the agricultural harvest, it is advisable to employ distinct marketing channels for various agricultural products. Gaining insight into farmers' comprehension of the various marketing channels at their disposal is of utmost importance. To gather data, a sample of 80 farmers from ten Taluks in Tumkur District was selected as respondents, and interview schedules were employed as the data collection method. The statistical validation of the statements was conducted using the SPSS software. Upon the completion of the study, the researchers propose suggestions and recommendations to the farmers regarding the optimal choice of

CC License CC-BY-NC-SA 4.0	marketing channels for their pomegranate produce ***Keywords:*** Pomegranate growers, Marketing Channels, Government Regulations, Agricultural Marketing, Harvest

I. INTRODUCTION

Agricultural marketing encompasses the examination of the various activities, entities, and regulations associated with the acquisition of agricultural inputs by farmers and the subsequent transportation of agricultural goods from farms to consumers. The agricultural marketing system serves as a crucial intermediary connecting the agriculture sector with the non-farm sectors. This encompasses the coordination of the supply of agricultural raw materials to processing businesses, the evaluation of the demand for farm inputs and raw materials, and the formulation of policies pertaining to the marketing of farm goods and inputs.

Agricultural marketing encompasses a series of activities that commence with the determination to cultivate a marketable agricultural product. This process encompasses the entirety of the market structure or system, encompassing both functional and institutional components, which are established based on technical and economic factors. Moreover, agricultural marketing encompasses various operations conducted before and after the harvest, such as assembling, grading, storage, transportation, and distribution. The agricultural marketing system in developing countries, such as India, can be conceptualized as consisting of two primary sub-systems: product marketing and input (component) marketing. The actors in the product marketing sub-system include farmers, village/primary traders, wholesalers, processors, importers, exporters, marketing cooperatives, controlled market committees and retailers. The input sub-system encompasses a range of entities involved in the provision of farm production inputs to farmers, including input manufacturers, distributors, relevant associations, importers, exporters, and other stakeholders.

According to **Thomson, A. M., & Terpend, M. N. (1993)**, agricultural marketing is the study of the processes and organizations involved in bringing farm-produced foods, raw materials, and their derivatives (like textiles) to consumers. This includes the evaluation of the economic, environmental, and social impacts of these activities.

Tumkur has been a key hub for pomegranate cultivation because to its good environment and excellent soil characteristics Farmers in Pomegranate are having trouble selling their goods since there is no established marketing system in place to help them do so. Farmers aren't making much money despite large output because of inefficient distribution Pomegranate's low demand can be attributed, in part, to consumers' ignorance of the fruit's health benefits. Governments and agricultural groups must aid farmers by improving distribution routes and spreading the word about the positive health effects of pomegranate in order to boost its price

The first section of the study gives an overview of the types of agricultural marketing channels considered in the study. The second section focusses on the review of literature. The research methods are specified in the third section and the fourth section presents the results of the study. The last section of this research concludes with limitations and scope for further research.

II. Review of Literature

This study employed a systematic literature review approach to analyze previous scholarly works that were pertinent to the research inquiries under investigation. The articles were sourced from reputed journals and were scrutinized to determine the level of quality exhibited by each study. Elsevier database, Routledge and CRC Press Taylor and Francis database. Emerald Group Publishing database, Springer Nature database and Sage database. Several supplementary articles were acquired from reputable academic databases such as Wiley, Academia, JSTOR, and Guildford Press.

- **SM, S., & Rajajabasingh, D(2021)** The marketing system needs to be strengthened through better cooperative marketing, the creation of regulated markets, the ranking of items, and the development of better transportation and storage options. The Agricultural Produce Marketing Committee (APMC) plays a crucial role in this regard, since it helps to advance academic study of agricultural marketing. Only nine APMCs were found in the entire Tumkuru district of Karnataka, where the research is being done. Farmers' expectations for the APMC's performance and problems with the organization's operation and functioning were the key foci of the study. The opinions of the participants were gathered through an interview

schedule and analyzed with SPSS Ver 22 and AMOS Ver 25. SEM analysis was used to verify the effectiveness of APMCs in terms of Farmer contentment. The survey found that certain features are not helping to increase farmer satisfaction, highlighting the need for swift action on the part of the government to enhance these features.

- **Kumar, J., et al (2020)** Karnataka has the most potential of any Indian state to produce Areca nuts. According to the latest available statistics (2018-2019), Karnataka has 464582 ha of land, yielding a total of 620348 MT each year. The Tumkur area of the state relies heavily on its plantation crops (mostly coconuts and Areca nuts). The primary purpose of this research was to identify the most effective distribution methods for Areca nuts and the limitations of this strategy. The research shows that three primary channels were used to advertise Areca nuts in the locations that were analyzed. Numerous market intermediaries were discovered in all three distribution routes. The research also found that channel 3's pricing spread was the highest (Rs. 48468.76) because of the high volume of middlemen involved in that transaction. Channel 2 also had the highest market efficiency (2.06) and the highest manufacturers' share of consumer rupees (50.26 percent). Processors were shown to play a secondary processing role in all three of the analyzed marketing channels. Some significant barriers to Areca nut marketing are shown by the research, including the presence of middlemen, a lack of technical knowledge, inadequate infrastructure, and price variations. To ensure that farmers in the study areas receive a fair price for their goods, the research recommends enhancing the existing marketing infrastructure.
- **Vijayalakshmi, N., & Yoganarasimhachari, K. (2019)** Since the second green revolution has been initiated, agricultural marketing and external trade in agricultural commodities have taken on greater significance in the effort to make India free of hunger and turn poverty into history as quickly as feasible. Twenty years ago, the marketing system faced very different issues than it does today. It analyzed the current state of marketing infrastructure in village heats, assembly centers, and terminal markets and predicted the infrastructure needs based on forecasted increases in agricultural surplus. The Working Group also investigated the developing alternative marketing channels and vertical linkages of marketing groups of farmers to retail and terminal markets and processors. Promoting producers or farmer associations requires providing them with funding for expert management services and the development of essential post-harvest handling and processing facilities. With the rise of supermarkets and other forms of organized retailing, it's important that farmer groups have access to the grading, sorting, and packaging facilities they need to better connect with consumers.
- **Pavithra, H. K., et al (2018)** The leaf of the betel vine, a perennial climber, is the plant's primary crop. In India, it is a crucial cash crop. The majority of betel vine growers are smallholders, making it difficult to market betel leaf. The problem of wild price swings has not yet been solved. It's true that motivating farmers requires a well-oiled marketing machine. Total marketing expenses varied noticeably across the two Tumkur district talukas studied, Pavagada and Gubbi. Pavagada had a greater marketing expense per Pindi, but the net price for the farmers was higher (Rs. 2413) than in Gubbi taluka (Rs. Farmers made a good profit, but they had to pay a high price to transport their goods to a faraway market. However, the resulting net price was also somewhat expensive in the faraway market. Mostly owing to transportation expense and commission, farmers in the Pavagada taluka spent more on marketing (Rs.160/P) than those in the Gubbi taluka (Rs.83/P). Betel-leaf supply and demand in the market exhibited clear seasonality. The cost of the leaves varied greatly depending on their hue and the time of year.
- **Vishwanath, H., et al (2016).** Technology, including new equipment, improvised machines, and information technology, has had a profound effect on modern agriculture, making it run very differently from that of even a few decades ago. This research was conducted in the Tumkur district of Karnataka State in the current academic year. A number of ICT initiatives, including the Kisan Call Center, Raita Mitra Kendras, Krishi Marata Vahini, and the e-Choupal, were chosen for this research because of their widespread implementation and visibility. There were 100 total samples taken. Based on the findings, it was determined that 65.0% of farmers were using the Kisan Call Centre whenever they had a need to do so, 45.0% were not using the e-Choupal, 50.0% of respondents were using the Krishi Marata Vahini whenever they had a need to do so, 24.0% had never used the service, and 25.0% used the Raith Mitra service whenever they had a need to do so. Most farmers (78%) use Krishi Marata Vahini services for regularly updated market prices; 36% of farmers use Raith Mitra Kendra for information on cultivation practices; 33% of farmers use KCC for information on crop protection; 31% of farmers use e-Choupal; and 31% of farmers use Raith Mitra Kendra for information on cultivation practices. It is hypothesized that many socioeconomic factors influence farmers' decisions to accept the new technology. Therefore, the ICT

enabled extension systems are playing a crucial role in influencing the agricultural condition and the farmers' life.

- **Karibasappa.H. G (2015)** The study's objectives were to investigate the factors that influence varietal preference, market preference for varieties, and the impact of government policies on the production and marketing of cotton, as well as to examine the relationship between the two. The research was carried out in the Bellary district, with primary data being collected from 60 farmers and 30 traders. The data was analyzed using Garret's ranking and compound growth rate, among other techniques. High yield, promotional activities, and early maturity are among the factors that influence farmer preferences, according to the study's findings. A garret's ranking for each of these factors is 58.10, 57.10, and 55.26, respectively. Cotton growers face a number of challenges, including a lack of high-quality seeds, a lack of timely availability of fertilisers, price fluctuations, and a lack of timely payments.
- **P.S. Dhananjaya (2015)** Their findings revealed that there were three necessary selling channels within the study space, which they identified. Producers, village level merchants, wholesalers, retail merchants, and clients constituted the majority of players in channel I, while producers, village level merchants, retailers, and clients constituted the majority of players in channel II, and producers, village level merchants, retailers, and clients constituted the majority of players in channel III. When comparing channel-III to channel-II and channel-I, the producer's share of the client rupee was higher (50.90 percent) in channel-III than in channel-II (46.80 percent) and channel-I (50.90 percent) (41.59 percent). Farmers were the most enthusiastic about channel-I, owing to the fact that farmers relished (received) the money immediately following the sale of the manufacture to a village-level merchant at the farm level. Furthermore, by using channel-I, the possibility of a violent value fluctuation in the open market can be avoided.
- **Syed Rizwan Ahmed (2014)** Production, market arrivals, price behaviour, and market linkages with paddy processing units in Bangarpet were all investigated in the APMC Bangarpet of Karnataka State for this study. The 15 rice millers provided the primary information for this study. The KSDA provided secondary information on paddy production, which was used in this study. The APMC provided the information on market arrivals and prices that was used in this report. The data were analysed using a variety of statistical techniques, including time series analysis techniques such as trends, seasonal indices, seasonal ARIMA, descriptive statistics, and Henry Garrett's ranking technique, among others. According to the findings of the study, the production of paddy in Bangarpet taluk has shown a decreasing trend, while the quantity of market arrivals of paddy in the APMC yard has shown an increasing trend in recent years. Arrivals at the market are at their highest during the month of December and at their lowest during the month of October. Rice prices were at their highest in November and at their lowest in April of this year, according to USDA data. Karnataka's rice millers are sourcing their paddy directly from farmers in the state's major paddy growing regions (93.33 percent). The rice millers sold the rice directly to retailers in Bangarpet town, rather than through a middleman (86.66 percent). The rice millers in Bangarpet have also been selling rice in the city of Bangalore (80 percent). It was also discovered that 46.66 percent of the rice millers in Kolar district have sold their rice in the neighbouring towns.
- **Anandu Bhovi (2012)** The researcher placed a strong emphasis on investigating the issues associated with the marketing process of coconut and coconut-related products in the state of Karnataka, specifically. A small number of districts were randomly selected for the study, and 30 farmers from various villages were recruited to participate as participants. The research concluded that coconut producers used two different types of marketing channels to reach their customers. Direct marketing is the first marketing channel, and it has the least potential for profit growth. It is the second marketing channel. Alternatively, the marketing channel II, which involves selling to factories, generates greater profits, but the farmers are unable to take advantage of these opportunities fully because of a lack of awareness and the involvement of intermediaries.

III. Statement of the Problem

There has been a rise in the number of suicides committed by farmers in India due to financial distress. Inadequate education, facilities, means of transportation, and personnel contribute to this predicament. There has to be an evaluation of farmers' present levels of awareness, and improved education about, options to sell their produce at the greatest potential prices. It is crucial to provide farmers with access to the latest technologies and farming techniques to enhance their productivity. Additionally, government support in terms of subsidies, loans, and insurance for crop failures can help alleviate their financial burden. Implementing policies that prioritize fair pricing and reduce middlemen exploitation can also ensure that

farmers receive a fair share for their hard work. By addressing these issues, we can work towards reducing the financial distress faced by farmers in India and prevent further tragic incidents of suicide.

IV. Objectives

- To study the awareness level of farmers in different marketing channels
- To analyse the factors hindering adopt agricultural e-market portals

Understanding the prevalence of usage of agricultural markets among the farmers of Karnataka is crucial for several reasons. Firstly, it provides insights into the adoption and acceptance of digital platforms in the agricultural sector. This knowledge can help policymakers and stakeholders identify the areas where e-markets are most effective and where further improvements are needed. Additionally, understanding the prevalence of agricultural markets can assist in formulating targeted interventions and support mechanisms to enhance farmers' access to these platforms, leading to increased market opportunities and improved efficiency in the agricultural value chain.

Hence, Research Question 1

What is prevalence of usage of agricultural markets among the farmers of Tumkur district?

There exist multiple factors that impede the adoption of e-agricultural marketplaces among farmers. The barriers encompass both infrastructure and knowledge-related aspects. Conducting a comprehensive study is of utmost importance in order to ascertain the precise prevalence of agricultural e-market usage among farmers in tumkur district. This study aims to ascertain the underlying factors contributing to the challenges encountered by farmers when adopting e-agricultural marketplaces. Through the identification and resolution of these obstacles, governmental entities and other relevant parties have the potential to facilitate the extensive integration of electronic marketplaces. Consequently, this might result in improved efficacy and financial gains for agricultural practitioners within the region.

Hence, Research Question 2

What are the factors that hinders farmers to adopt agricultural e-market portals?

The above mentioned research questions are analysed using the following methodology

V. Research Design

Table 1- Research Design

Geographical Area	Taluks Of Tumkur District					
Population	Farmers Of Tumkur District					
Research Area	Agricultural Marketing					
Sample Size	80 Farmers					
	Sample design					
	Taluks	Sample villages	Marginal	Small	Medium	Large
	Tumkur	1	2	2	2	2
	Gubbi	1	2	2	2	2
	Koratagere	1	2	2	2	2
	Kunigal	1	2	2	2	2
	Madhugiri	1	2	2	2	2
	Pavagada	1	2	2	2	2
	Sira	1	2	2	2	2
	Tiptur	1	2	2	2	2
	Chiknaykalli	1	2	2	2	2
	Turuvekere	1	2	2	2	2
			20	20	20	20
				80		
Sampling Method	Convenient Sampling					

Data Collection	Primary Data Collection: Questionnaire And Interview Schedules
	Secondary Data Collection: Journals, Govt Websites, Articles And Magazines
Statistical Tools	ANOVA / SEM Analysis
Research Type	Survey Based Descriptive Research

VI. Results and Discussions

Demographic Profile of the Farmers

There 86% male farmers and 14% female farmers in the study. In India, their husband farmer generally leads women farmers. There are very few independent women farmers. 12.8% farmers are in the age group of 18-25 years, 38.4% farmers are in the age group of 25-35 years. 27% farmers belong to 35-45 years of age. 15.1% farmers are in age group of 45-55 years and 6.7% farmers are above 55 years of age. 27.6% farmers have completed their Primary school, 54.1% have completed their secondary school and 14% have either completed their PUC/Diploma and 4.4% have completed their graduation. 36.3% have less than 4 members in the family and contrast 32% have more than 8 members in the family. The families in rural area are generally joint families with more members. 23% expressed that they earn less than 30,000 annually. 64% earned between 30,000-90,000 and 13.1% earned above 90,000 every year. 33.4% farmers are marginal farmers with less than 1 Acre of land for farming, 49.4% are small farmers who have 1-5 acres of land and 17.2% are medium farmers with more than 5 Acres of land holding.

Marketing Platforms used by Farmers

Table 2 - Marketing Platforms used by Farmers

		Never	Rarely	Sometimes	Often	Always	Mean	Rank
Third party E-commerce application	F	63	47	47	94	93	3.31	3
	%	18.3	13.7	13.7	27.3	27		
Own Website	F	248	48	36	12	0	1.45	7
	%	72.1	14	10.5	3.5	0		
Mandi	F	0	15	62	142	125	4.1	1
	%	0	4.4	18	41.3	36.3		
ENAM	F	0	297	31	16	0	1.28	8
	%	0	86.3	9	4.7	0		
Traders	F	0	45	109	126	64	3.61	2
	%	0	13.1	31.7	36.6	18.6		
Middleman	F	0	77	172	47	48	3.19	4
	%	0	22.4	50	13.7	14		
Rashtriya e Market Service	F	124	45	80	63	32	2.52	5
	%	36	13.1	23.3	18.3	9.3		
Direct to customer	F	0	222	62	45	15	1.57	6
	%	0	64.5	18	13.1	4.4		

54.3% agreed that they market their produce using the Third party E-commerce applications. 77.6% agreed that they go to Mandis for marketing and selling their produce. 86.3% farmers said that they rarely use e-NAM for selling their produce. 45.2% farmers went to the traders to sell their agricultural produce. 72.1% farmers in the study do not have their own website to sell the Products.

The statistical data indicates that farmers continue to rely on Mandis and Traders, while government-led initiatives like as e-Nam and ReMs are utilized to a lesser extent by the agricultural community. The aforementioned observation highlights a notable disparity in the acceptance and implementation of electronic market platforms across the agricultural community in the state of Karnataka. It is imperative for governmental entities and other relevant parties to comprehend the underlying factors contributing to this limited utilization and subsequently tackle the obstacles hindering digital inclusion. Farmers can enhance their ability to access markets and increase their profitability by expanding their awareness, receiving training and support, and enhancing the accessibility and functionality of e-market platforms.

Barriers for adoption of e-marketing Platforms

Table 3- Barriers for adoption of e-marketing Platforms

	Mean	Std.Deviation	Skewness	Kurtosis
Barriers_1 Lack of internet connection in villages	1.36	0.89	3.215	10.287
Barriers_2 Cost of Computer and Internetcharges	1.97	1.343	1.453	0.827
Barriers_3 Lack Of User friendly Banking process	2.74	0.916	0.924	1.219
Barriers_4 Lack Of marketing for Government E-Agri platforms	3.42	1.027	0.627	-0.946
Barriers_5 Lack Of trust in Electronic Transactions	3.15	0.965	0.933	-0.046
Barriers_6 Lack Of knowledge in using E-Agri websites	3.82	1.11	-0.024	-1.654
Barriers_7 Lack of government support and training	3.68	1.138	0.108	-1.583
Barriers_8 Lack of proper delivery channel	3.41	1.268	0.273	-1.61
Barriers_9 Lack of Storage for agriculture products	2.92	1.126	0.759	-0.293
Barriers_10 Extra Cost Incurred in processing the agri products to sell it online	3.14	1.099	0.76	-0.747
Barriers_11 I don't have any other option to sell my product	2.02	1.061	0.838	0.334

To identify the Barriers faced by farmers in adoption of e-marketing platforms, 11 items were administered to the farmers. Lack Of knowledge in using E-Agri website (M=3.82) and Lack of government support and training (M=3.68) had high mean scores. Lack of proper delivery channel, Lack of Storage for agriculture products and Extra Cost Incurred in processing the agri products to sell it online were some of the barriers for adoption of e-marketing Platforms. The presence of these barriers suggests that farmers in Karnataka encounter difficulties when it comes to effectively utilizing e-market platforms for the purpose of achieving digital inclusion. The observed deficiency in farmers' proficiency in utilizing E-Agri websites implies a potential requirement for enhanced training and education to enhance their competence in effectively navigating and leveraging these digital platforms. Furthermore, the lack of governmental assistance and training is an additional obstacle to the implementation of e-marketing platforms. This underscores the necessity for increased government support and resources to promote digital inclusion among farmers. Farmers have significant problems in selling their agricultural products online due to the absence of adequate delivery methods and storage facilities. Furthermore, the additional expenses associated with the processing of agricultural goods for online commerce contribute to the challenges encountered by farmers, underscoring the necessity for cost-efficient remedies and assistance in this matter. Furthermore, it is common for farmers to possess insufficient technical expertise and understanding necessary for proficiently navigating e-marketing platforms and efficiently utilizing digital tools. This further underscores the necessity of governmental assistance in offering training and educational initiatives aimed at augmenting the digital literacy skills of farmers. The government may play a significant role in facilitating the use of e-marketing platforms by farmers and facilitating their access to the resources required for digital inclusion in the agricultural sector. Table -3 shows the descriptive statistics for barriers in adoption of e-marketing Platforms. The Standard deviation is below 1.500 indicating least variation in responses, the skewness and kurtosis are within the acceptable range and the data is deemed to be normally distributed.

H1 - The mode of selling agricultural produce depends on the scale of agricultural produce and land availability.

Table 4- ANOVA Results - mode of selling agricultural produce depends on the scale of agricultural produce and land availability

ANOVA			
	Mean Square	F	Sig.
EMP_1 Third party E-commerce application	11.759	5.662	0.004
EMP_2 Own Website	1.717	2.593	0.076
EMP_3 Mandi	4.673	6.796	0.001
EMP_4 ENAM	10.977	15.675	0
EMP_5 Traders	18.227	23.583	0
EMP_6 Middleman	17.545	22.304	0
EMP_7 Rashtriya e Market Service	15.255	8.371	0
EMP_8 Direct to customer	3.822	5.081	0.007

The ANOVA Results show that at 74,3 degrees of freedom and F statistics above 2.000 and significance value of 0.000, there is a significant difference in mode of selling agricultural produce based on the scale of agricultural produce and land availability. Scheffe Post hoc Analysis is used to check which type of farmers has highest adoption of e-markets.

The scheffe post hoc analysis shows that Marginal and small farmers prefer online mode of selling their produce and medium scale farmers preferred the Mandis and traders. This preference may be explained by the fact that it is more convenient for marginal and small farmers to sell their products via online platforms, despite their limited access to technology and internet connectivity. However, medium-sized farms may favor Mandis and merchants because of the long-standing ties they've had with them. The results suggest that initiatives should be taken to close the digital divide among Karnataka's farmers, making sure that all farmers, no matter how big or little, have access to e-market platforms and technology. Increasing internet access in rural areas and assisting farmers in outlying regions are two ways to accomplish this goal. Government programs can also play a significant role in encouraging the adoption of e-market platforms by providing subsidies and incentives to farmers who make the transition to digital distribution channels. If all Karnataka farmers had the same opportunities and resources, they could take advantage of the streamlined process of selling their goods online.

H1 - The mode of selling agricultural produce depends on the scale of agricultural produce and land availability is accepted

H2- There is a significant impact of Infrastructural and knowledge barriers in implementation of agricultural e-markets in Tumkur Districts .

STEP -1 Exploratory factor analysis

The KMO measure of sampling adequacy, which is equal to 0.888, and Barlett's Test of Sphericity, which comes with a significance level of 5%, are statistically significant. It was found by chi-square analysis that the Chi-square value of the Bartlett test is 3209.750 with the significant value less than 0.05 and 127 degrees of freedom, which shows that correlation matrix, is not an identity matrix and that it looks to be factorable.

Communalities refer to the extraction values for each of the items and should be above 0.300 and the communalities for Barriers were between 0.542 and 0.818

The total of squared loadings that has been removed accumulates to about 72.981% of the original loadings. In social sciences, a cumulative Rotation Sums of Squared Loadings is considered good if it is above 50%. 2 components are discovered while applying the approach of Factor Analysis, according to the results of the study.

The rotated component matrix showed that due to the appropriate factor loadings one item was deleted in the study (Barrier_10). Two components identified are infrastructural barriers (5 items) and Knowledge barriers (5 items).

Step -2 Run the model

Table 5 – Model fit statistics for H2

Model Fit Summary				
CMIN				
Model	NPAR	CMIN	Degrees of Freedom	CMIN/DF (χ2/df)
Default model	119	212.997	123	2.876
Criteria				<3.000
RMR, GFI				
Model	RMR	GFI	AGFI	PGFI
Default model	0.048	0.826		
Criteria	<0.100	>0.80		

The value of the chi-square divided by the degrees of freedom (χ2 / df) is within the acceptable range of 3, particularly 2.876. The observed value of Goodness of Fit (0.826) exceeds the proposed qualities. The boundary estimation results in a calculated value of 0.048 for the RMR. The aforementioned approach has received substantial attention among scholars, and its indicators of adequacy are reasonably suitable.

Table 6 – Structural relationship - impact of Infrastructural and knowledge barriers in implementation of agricultural e-markets in pomegranate state

			Unstd Estimate	Std Estimate	P
Barriers_9	<---	Infrastructure	1	0.958	***
Barriers_8	<---	Infrastructure	0.923	0.785	***
Barriers_3	<---	Infrastructure	0.199	0.235	***
Barriers_2	<---	Infrastructure	0.987	0.892	***
Barriers_1	<---	Infrastructure	0.421	0.51	***
Barriers_11	<---	Knowledge	1	0.496	***
Barriers_7	<---	Knowledge	0.534	0.709	***
Barriers_6	<---	Knowledge	0.705	0.808	***
Barriers_5	<---	Knowledge	0.982	0.616	***
Barriers_4	<---	Knowledge	0.454	0.745	***
Barriers_emarket	**<---**	**Infrastructure**	**0.289**	**0.195**	*******
Barriers_emarket	**<---**	**Knowledge**	**0.394**	**0.249**	*******

In structural equation modeling (SEM) analysis, unstandardized estimates pertain to the coefficients of the regression equation that establish the relationship between the latent variables. These estimates offer insights into the magnitude and orientation of the association between the latent variables. Within the framework of this model, the unstandardized estimates would serve the purpose of assessing the barriers of e-market platforms on the digital inclusion of farmers in Karnataka. Through the examination of these estimations, policymakers and researchers can gain insight into the degree to which electronic market platforms contribute to the holistic welfare and economic empowerment of farmers within the given geographical area.

- One unit increase in mean scores of Infrastructure barriers , there is 29% increase in the barriers to adopt e-market platforms by the Farmers (B= 0.289 , b=0.195, p=0.000)
- One unit increase in mean scores of Knowledge barriers , there is 39% increase in the barriers to adopt e-market platforms by the Farmers (B= 0.394 , b=0.249, p=0.000)

The findings derived from the structural equation modeling (SEM) research indicate that barriers related to knowledge and infrastructure influence the adoption of e-market services by farmers. The barriers encompass restricted availability of technology and a dearth of knowledge regarding the advantages of electronic market platforms. Furthermore, the research revealed a positive correlation between farmers' educational attainment and income levels, and their propensity to embrace e-market services. The results indicate that there is a

requirement for specific interventions aimed at overcoming these obstacles and fostering digital inclusion within the farming community in Tumkur.

Figure 1 –Pictorial representation of Structural relationship - impact of Infrastructural and knowledge barriers in implementation of agricultural e-markets in Tumkur District

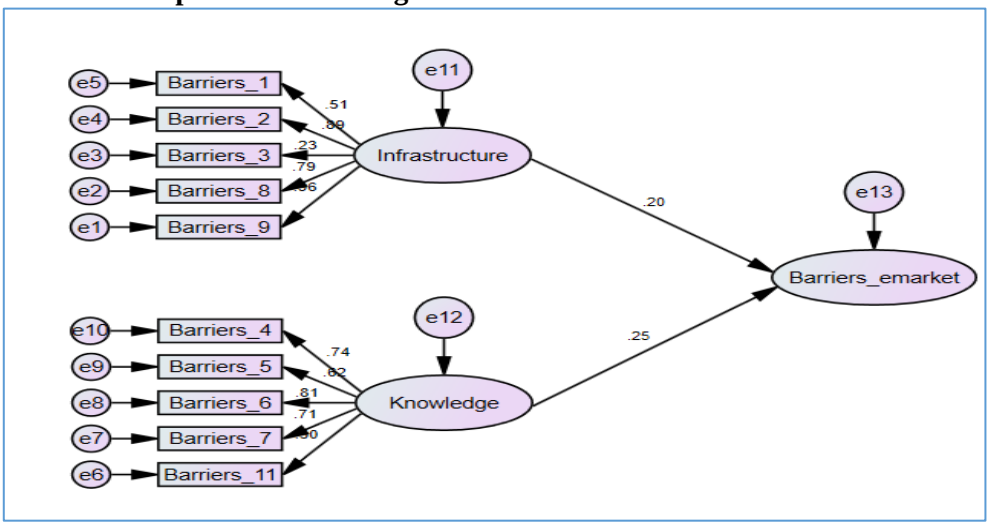

Figure 1 Shows the standardized estimates which indicate the knowledge barriers are more significant than infrastructural facilities which hinder the adoption of e-market platforms. Knowledge barriers pertain to the insufficient knowledge possessed by farmers in relation to the adoption of e-marketing platforms. On the other hand, infrastructural factors encompass aspects such as internet connectivity and the availability of smartphones, among others. The aforementioned knowledge and infrastructural barriers can be effectively addressed through a range of strategies and interventions. For example, the provision of training sessions and workshops to farmers about the utilization of e-market platforms has the potential to enhance their understanding and bolster their confidence in embracing digital solutions. Enhancing internet connectivity and facilitating the accessibility of smartphones in rural regions might also serve as viable measures to mitigate infrastructural challenges. By mitigating these obstacles, farmers in Karnataka can effectively leverage e-market platforms and actively engage in the digital economy, resulting in enhanced market reach and enhanced livelihoods. The findings additionally indicated that knowledge barriers have a greater impact than infrastructural constraints. By implementing training and educational initiatives targeted at farmers, particularly those residing in geographically isolated regions, it is possible to effectively address and overcome the existing knowledge obstacles. The allocation of resources towards workshops and seminars that specifically address digital literacy and e-commerce abilities has the potential to enhance the ability of farmers to proficiently utilize e-market platforms. Furthermore, the establishment of a conducive ecosystem that fosters knowledge exchange among agricultural practitioners can significantly augment their comprehension and use of digital innovations. In order to fully harness the potential of digital solutions and stimulate economic growth in the agricultural sector, it is imperative for farmers in Karnataka to effectively tackle both infrastructure and knowledge hurdles.

H6- There is a significant impact of Infrastructural and knowledge barriers in implementation of agricultural e-markets in Tunkur District is accepted

VII. Recommendations

- The objective is to propose legislative solutions that can effectively facilitate substantial advantages for farmers, reduce transaction costs for buyers, and maintain stable pricing and availability for consumers. This can facilitate the establishment of a unified platform for the auctioning of agricultural products.
- In accordance with the government's 'One Nation One Market' strategy, which aims to enhance the agricultural marketing sector and augment farmers' income, the generation of suggestive evidence is sought.
- The study may help to protect the farmers by reducing their economic distress and suicide rates.
- The study helps to prevent the agony caused to farmers for the lack of fair pricing for their produce.
- The study may make the farmers to utilize the cost effective digital technology for betterment of their economic status.

- In order to enhance the extensive dissemination of digital interventions among farmers for the purpose of facilitating sales at the nearest mandi. By doing so, it guarantees a justifiable price for the agricultural products, thereby mitigating the adverse economic conditions faced by the farming community.

VIII. Conclusions

For the Agricultural marketing activities to be successful, it is essential that they be extensive and well-organized. The current market must include two components: a marketing system and a genuine direction for the market's leadership position. The need to improve the quality of the directed market framework arises as a result of the changing nature of the links between pomegranate growth and markets. It has been demonstrated that more efficient and straightforward market access, as well as a reliable data stream, can result in the much-desired market introduction of the creation framework. It is the transition of Indian agriculture from commodity to commercialization that drives it towards market introduction. Agricultural cooperatives in India are the largest in the world, and they are involved in the assembly, acquisition, and marketing of agricultural produce. These have proven to play a critical role in the development of our economy. The legislature must examine its policies and procedures in order to improve the quality of the advertising system and ensure that costs are resolved on an aggressive basis and that markets are under control. Using modern information and communication technology (ICT) can result in better arrangements because it can facilitate agrarian advertising capacities and procedures such as purchasing and offering, instalment, reviewing institutionalization, and transportation in a more efficient manner.

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