

A STUDY ON SIGNIFICANT INFLUENCE OF E-COMMERCE ADOPTION IN AGRICULTURAL SECTOR THROUGHOUT THE COVID-19: BENEFITS AND LIMITATIONS

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ABSTRACT

Agriculture is the solution to the overall development of any country. The internet lasts to become more widespread among people who transact with the agricultural business of any type. The incomplete health crisis about COVID 19 has affected all communities Frontline Health Responders are a priority for countries in saving the lives of the people suffering from this disease. The government has taken action since the Coronavirus hit created an extraordinary situation. India initially announced a three-week nationwide lockdown until the middle of April, after that was extended to achieve satisfactory control of the virus outbreak. In these tough times how Indian farmers react to the crisis and the actions taken by the government to help farmers across the country. The main objective of the study is to analyze the impact of e-commerce on the agricultural sector throughout the Covid 19 pandemic. The study employs samples from farmers of the Warangal and Nalgonda districts. The purpose of the study is to examine the E-commerce sources selected for the agriculture sector and Reasons for using e-commerce in the agriculture and Overall satisfaction on utilization of e-commerce in agriculture sector throughout covid-19. The result reveals that farmers started benefiting from the use of e-commerce in their agriculture. The findings of the study suggest that government should take little more initiation in training and supplying them with agricultural inputs with subsidies. The study briefly explains the Objectives, Hypothesis, Data analysis, Impact, Role, Benefits, and Limitations of E-Commerce in the agricultural sector throughout covid-19.

Keywords: E-Commerce, Agricultural Sector, COVID 19, Impact, Benefits, and Limitations.

JEL Classification Codes: J43, N5, Q13, L81, P32.

INTRODUCTION

Many companies started searching for solutions to overcome the effects of covid-19. “The new normal” COVID 19 changed the transition to a digital future globally. Current developments in information technology have caused important economic significances. COVID 19 pandemic raised one of the challenges for the agricultural e-commerce business. E-commerce is one of the genuine outcomes of information technology that has many advantages like world trading, removing temporal and spatial constraints, reduced costs of purchased resources, increased sales, easy access to information, an essential decline in transaction costs, and the time of transaction. One of the inconveniences faced by agricultural production is procuring raw materials, marketing, and customer satisfaction. Even though the total revenue of agricultural production within humankind is high, farmers’ revenue is low down, and in some cases, the farmers’ profits are on the edge of zero or maybe negative.

Origin of E-Commerce

Still, in this pandemic situation, some of the Indian farmers won’t have awareness of Modern Agriculture. In India, there is a huge scope for Modern Techniques in Agriculture, if we observe, gradually the farmer is going ahead showing interest in the Modern methods. Yet, this increase is not enough comparing with the other countries. The main reason behind this is often the shortage of awareness among the farmers. Electronic commerce becomes evident in the 1990s, and its exercise has improved in a short time. The majority of companies are having an online spirit. Conducting business on the web is important these days. Everything from food and garments to entertainment and furniture is regularly bought online³. Amazon and Flipkart are the major companies having business by using E-commerce. These companies allow customers to purchase different types of goods and services online. Consumers have several payment options, as well as choices for how their products are delivered.

E-Commerce in Agriculture

E-Commerce has flourished a major break in the agriculture sector. Now a day’s internet becomes more popular among all customers. Some people use the internet for agriculture or irrigation. The farmers are becoming aware of the use of software and hardware. The thing which is needed is the internet with both the parties’ i.e. the one that is buying and therefore the one that is selling.

REVIEW OF LITERATURE

Zeng et al. (2017) authors considered the firm-level adoption of internal and external factors affecting agricultural food e-commerce. They discussed the five typical e-commerce models which are very commonly adopted these days. They identified 4 types of adopters; they are agribusiness firms, e-commerce firms, agricultural cooperatives, and individual farmers at the firm level. The authors finally indicated about the adoption and development of e-commerce is a modern way of influencing food systems and market entrance for smallholders.

Yadav and Sharma (2015) study has reviewed 110 research papers on agriculture credit. The focus was on determinants of sources and the amount of agriculture credit. According to the study, agriculture has been given more priority in recent years. The government also focused on institutional credit and took many policy measures to improve financial inclusion.

Dsouza and Joshi (2014) authors discussed briefly the framework for rural agriculture e-commerce. The authors pointed out two main factors for developing the framework. They are

better farming practices and well-planned marketing of agricultural products. With these factors and frameworks, the development of agriculture e-commerce is possible.

Carpio et al. (2013) this is a case study that discusses the market makers. The authors framed a market makers producer logic model that represents the intakes and outputs in the long and short run. They analyzed many categories of businesses participating in market makers. They evaluated the impact of market makers on the producers and farmer's markets. They suggested lessons for e-commerce development and evaluation in the future.

Nadarajan and Ismail (2011) authors discussed the e-commerce framework for rural agriculture and the application of e-commerce components in agriculture. The agricultural e-commerce application consists of six features, which were discussed in the study. The authors discussed promotional techniques in agriculture and foreword of online trade exchange platforms for improving sales and marketing for the supply chain and the effectiveness of agricultural products.

The research gap identified is very fewer studies are carried out based on analyzing the benefits and limitations of e-commerce adoption in the agriculture sector throughout covid-19. The study tries to cover the research gap with few more samples. Based on this literature and research gap few objectives were framed.

PROBLEM STATEMENT

The study explains the problems faced by the farmers due to covid-19 from the selected areas.

OBJECTIVES OF THE STUDY

- To analyze the influence of e-commerce adoption on the agricultural sector throughout covid-19.
- The study explains the role of e-commerce adoption in the agricultural sector.
- The study analyses the Benefits and Limitations of E-Commerce in the agricultural sector throughout covid-19.

HYPOTHESIS

- There is no significant influence of e-commerce adoption on the agriculture sector throughout covid-19
- There is no significant influence of e-commerce on benefits towards the agriculture sector throughout covid-19.
- There is no significant influence of e-commerce on limitations towards the agriculture sector throughout covid-19.

RESEARCH METHODOLOGY

Sources of Data

Primary Data

Data has been gathered from 160 farmers in the districts of Warangal and Nalgonda. Interacted with the farmers who are using and who are not using e-commerce in the agriculture sector.

Secondary Data

Data from websites, journals, and books are used for the study.

Scope of the Study

The scope of the study is restricted to analyzing the services rendered by E-Commerce to the agriculture sector in few districts of Telangana state. Data was gathered from 160 farmers through a telephone survey and a few by personal interaction because of Covid-19. The data was gathered in the month of August 2021. A few aspects like impact, role, benefits, and limitations are discussed.

Sample Size

The population for the present study is the farmers of Warangal and Nalgonda. As collecting data from the farmers became very tough in this pandemic, Responses were received from 160 farmers from two districts. For the present paper, a convenience random sampling technique was used.

Tools Used For the Study

Tools like Percentage analysis, Chi-Square, and ANOVA were used with the help of SPSS.

DATA ANALYSIS AND INTERPRETATION

Table 1. Tabular representation of Demographic factors which are considered for the study

Demographic factors	Objects	No. of Answerers	Valid Percentage
Gender	Male	94	59
	Female	66	41
	Total	160	100
Age	18-25 years	21	13
	26-30 years	44	28
	31-40 years	51	32
	41-50 years	27	17
	51-60 years	4	3
	60+ years	13	8
	Total	160	100
Educational qualification	Post graduate	31	19
	Under graduate	41	26
	Secondary	38	24
	Primary	27	17
	Others	23	14
	Total	160	100
Period of using e-commerce in agriculture sector	Less than 1 year	22	14
	1-2 years	48	30

	2-3 years	52	32
	3-4 years	29	18
	Above 4 years	9	6
	Total	160	100
Marital Status	Married	98	61
	Unmarried	62	39
	Total	160	100
E-commerce sources selected for agriculture sector	Amazon	71	44
	Flipkart	49	31
	Snapdeal	23	14
	Shopify	8	5
	eBay	4	3
	Others	5	3
	Total	160	100

Interpretation: Table 1 explains the demographic factors of the respondents; the total sample size is 160. Out of the total sample size, 59% of the respondents are Male population and 41% of the samples have been gathered from the Female population. The male farmers who do farming are more when differentiated from the female farmers. But when differentiated to earlier years female farmers are escalating. The majority of them are from the age limit of 31-40 years, then by 26-30 years. This indicates that many youngsters are taking farming as their profession. Most of the farmers have finished their under graduation and few completed their secondary education. Lack of employment opportunities during Covid times is also a reason for the shift of many people to agriculture. 32% of the farmers are taking the help of e-commerce in agriculture for 2-3 years, then by 1-2 years. Almost 61% of the respondents are married, and 39% are unmarried. Amazon and followed by Flipkart are the major sources selected for the agriculture sector.

Table 2. Reasons for using e-commerce in agriculture

Reasons for using e-commerce in agriculture	Number	Percentage
Eradicate intermediaries	34	21
Improves income to the farmers	37	23
Decreases wastage	43	27
Providing fresh products to the customers	46	29
Total	160	100

Interpretation: Table 2 represents the reasons for using e-commerce in the agriculture sector. Many of the farmers decided that providing fresh commodities to the customers and followed by decreasing wastage. Later it improves income to the farmers and eradicates intermediaries.

Table 3. Overall satisfaction on utilization of e-commerce in agriculture throughout covid-19

Overall satisfaction on utilization of e-commerce in agriculture sector after covid-19	Number	Percentage
Very satisfied	93	58
Satisfied	40	25
Neutral	18	11
Dissatisfied	9	6
Total	160	100

Interpretation: Out of 160 farmers 58% of farmers are extremely fulfilled with the overall satisfaction on utilization of e-commerce in the agriculture sector throughout covid-19, and few 25% respondents are satisfied. Among the total farmers, 6% of them are dissatisfied with the services.

Table 4. Impact of e-commerce adoption on agriculture sector throughout covid-19

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.393 ^a	32	.447
Likelihood Ratio	37.630	32	.227
Linear-by-Linear Association	7.847	1	.005
N of Valid Cases	160		

Symmetric Measures

		Value	Approx. Sig.
Nominal by	Phi	.450	.447
Nominal	Cramer's V	.225	.447
N of Valid Cases		160	

Interpretation: Chi-Square is a single value that explains how much difference exists between the observed values and the expected values. Here in this case we can conclude that no relationship exists between the variables. Since the p values are 0.447 which is greater than 0.05. The null hypothesis is accepted and the alternative hypothesis is rejected at a 5% level of significance, therefore the power of alliance among variables is very low. There is no significant difference in e-commerce adoption in the agriculture sector throughout covid-19.

Table 5. Impact of E-commerce on benefits of the agricultural sector throughout covid-19

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	76.271 ^a	30	.000
Likelihood Ratio	89.227	30	.000
Linear-by-Linear Association	9.915	1	.002
N of Valid Cases	160		

Symmetric Measures			
		Value	Approx. Sig.
Nominal by	Phi	.690	.000
Nominal	Cramer's V	.399	.000
N of Valid Cases		160	

Interpretation: Since the p values are 0.000 which is less than 0.05. The null hypothesis is rejected and the alternative hypothesis is accepted at a 5% level of significance, therefore the strength of association between variables is very strong. There is a significant difference in e-commerce adoption on benefits of the agriculture sector throughout covid-19.

Table 6. Impact of E-commerce on Limitations to the agricultural sector throughout covid-19

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	61.377 ^a	57	.322
Likelihood Ratio	65.998	57	.194
Linear-by-Linear Association	5.746	1	.017
N of Valid Cases	160		

Symmetric Measures			
		Value	Approx. Sig.
Nominal by	Phi	.619	.322
Nominal	Cramer's V	.358	.322
N of Valid Cases		160	

Interpretation: Since the p values are 0.322 which is greater than 0.05. The alternate hypothesis is rejected and the null hypothesis is accepted at a 5% level of significance, therefore the strength of association between variables is very low. There is no significant impact of e-commerce on Limitations towards the agriculture sector throughout covid-19.

Table 7. Tabular representation of the influence of e-commerce on benefits of agriculture sector throughout covid-19

Test of Homogeneity of Variances

Levene Statistic	df ₁	df ₂	Sig.
35.630	3	156	.000

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.834	3	1.945	4.725	.003
Within Groups	64.205	156	.412		
Total	70.039	159			

Interpretation: Here in this case the table 5 represents how e-commerce influences the benefits towards the agriculture sector throughout covid-19. Since the p-value is less than 0.05, we will accept the alternate hypothesis at a 5% level of implication concerning e-commerce which influences benefits towards the agriculture sector throughout covid-19. Therefore there is a significant influence of e-commerce on the benefits of the agriculture sector throughout covid-19. The factors considered are a decrease in farmer’s efforts, Time saving process, better marketing and exposure, and selling products directly to the customers.

Table 8. Tabular representation of the influence of e-commerce on limitations of agriculture sector throughout covid-19

Test of Homogeneity of Variances

Levene Statistic	df ₁	df ₂	Sig.
1.825	3	156	.145

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.290	3	4.097	4.239	.007
Within Groups	150.764	156	.966		
Total	163.053	159			

Interpretation: Here in this case the above table represents how e-commerce influences the limitations towards the agriculture sector throughout covid-19. Since the p-value is less than 0.05, we will accept the alternate hypothesis at a 5% level of significance concerning e-commerce which influences limitations towards the agriculture sector throughout covid-19. Therefore there is a significant influence of e-commerce on limitations of the agriculture sector

throughout covid-19. The factors like high maintenance cost, lack of experts, no proper market, and shortage of suppliers.

IMPACT OF E-COMMERCE ON AGRICULTURAL SECTOR THROUGHOUT COVID-19

There was a significant impact of e-commerce in the Agriculture sector in the last few decades. Several actions had Government flourished since the Coronavirus attack and created this pandemic situation. After the nationwide lockdown, the Indian Finance Minister has announced and declared an INR 1.7 trillion package, to protect the vulnerable sections including farmers out of which Rs 2000 to farmer's bank accounts to support farmers under the scheme of PM-KISAN. Agricultural e-commerce helped farmers to eliminate intermediaries, which resulted in increased income to the farmers by reducing wastage. They can deliver fresh commodities to the customers.

To take care of weakness destructibility population, Pradhan Mantri Garib Kalyan Yojana (Prime Minister Scheme for the welfare of the poor), additional grain allotments to the registered beneficiaries were also announced for the next three years. A separate PM-CARES (Prime Minister Citizens Assistance and Relief in Emergencies); created the fund to assist cash and food to the persons engaged in the informal sectors, preferable migrant labours. State-wise guidelines were issued by the Indian Council of Agriculture Research (ICAR), for the farmers during the lockdown period. The advisory also mentioned various practices during harvest and threshing of various rabi (winter-sown) crops as well as post-harvest, storage, and marketing of the farm produce. The RBI also announced specific measures that specify the "burden of debt servicing" due to COVID 19. Banking institutions also granted agriculture loans and crop loans for a moratorium of three months with a 3 percent concession on their interest rate for crops up to Rs 3 lakh.

ROLE OF E-COMMERCE ON THE AGRICULTURAL SECTOR THROUGHOUT COVID-19

- A rapid increase in the practice of digital technology like digital payments made farmer's purchases easy.
- Due to the restrictions in meeting and social distancing e-commerce platforms highlighted indispensable digital transactions have accelerated to the small holder's farmers to the digital payments and consumer-used online payments.
- E-Commerce plays a major role for the farmers to develop and market their products globally even in this pandemic situation.
- By the end of June 2021, certain measures had extended and observed a rise in the usage of E-commerce in the agriculture sector.
- There is an enhancement in the E-commerce models for better performance of the businesses throughout this pandemic situation.
- A new boom in the partnerships has extended during Covid-19.
- Huge demand and order for organic products were received at the marketplace through digital channels without any significant marketing campaigns during the pandemic.
- Farmers can sell their products directly to their customers without any intermediaries during this pandemic.
- Getting raw materials like seeds, fertilizers, and pesticides have become easy for the farmers with the help of e-commerce during the pandemic.

- E-Commerce helped the customers in getting agricultural products directly from the farm.

Meanwhile, several organizations were shut down in this lockdown situation. Customers started moving towards e-commerce for acquiring their requirements. This benefited the farmers who are using e-commerce to sell their products to their customers without any intermediaries.

BENEFITS OF E-COMMERCE ON AGRICULTURE AFTER COVID-19

- The use of e-commerce can control the efforts of farmers.
- It is a process that saves the time of the farmers by using e-commerce in farming.
- E-commerce helped farmers in searching for machines that can replace human resources like machines for sowing the seeds, cutting the crops, removing the weeds, etc⁶.
- Improved irrigational technology.
- Farmers initiated better marketing and exposure to the price.
- There are many facilities in online trading and E-Commerce for farmers.
- As people started giving priority to healthy products, Farmers started organically producing the products.

LIMITATIONS OF E-COMMERCE TO AGRICULTURE THROUGHOUT COVID-19

- The cost of maintenance became very high.
- Lack of experts who explain the usage of e-commerce during the pandemic.
- Most of the farmers are illiterates so they are unable to use the services of e-commerce during the pandemic.
- As most of the farmers are illiterates the time taken for them to understand the use of e-commerce during pandemics became highly tough.
- The challenge of managing perishable products became more complex in this pandemic.
- Agricultural products during the pandemic did not have a proper market.
- Lack of better and spontaneous agricultural practices
- Lack of healthier marketing techniques exposure and pricing during the pandemic
- Lack of improved networking and communication
- Lack of enhanced depiction at various opportunities, establishments, and platforms, etc.

LIMITATIONS OF THE STUDY

- Because of the lack of practical knowledge and pandemic situations, the farmers were not able to handle the machines properly.
- Even the value of maintenance became additionally high.
- As most of the farmers are illiterates, more time was taken by them to understand the use of e-commerce throughout covid-19.
- Lack of proper internet in villages may be an obstacle.

CONCLUSION

Many of the farmers believe in providing fresh commodities to the customers and followed by decreasing wastage. Later it improves income to the farmers and eradicates intermediaries. The majority of the farmers are extremely fulfilled with the overall satisfaction on utilization of e-commerce in the agriculture sector. With analysis, it reveals that there is no significant difference in e-commerce adoption in the agriculture sector throughout covid-19. The results represent that there is a significant difference in e-commerce adoption on benefits of the agriculture sector, but

there is no significant impact of e-commerce on Limitations towards the agriculture sector throughout covid-19. Factors like a decrease in farmer's efforts, Time saving process, better marketing and exposure, and selling products directly to the customers have a positive influence on the benefits of the agriculture sector throughout covid-19. The factors like high maintenance cost, lack of experts, no proper market, and shortage of suppliers have a significant influence on limitations of the agricultural sector throughout covid-19.

With the enhancement in the technology used for agriculture, we can help the farmers know what is happening around the world. There may be drawbacks with it but it seems to be that, technology provides enhanced advantages in many cases. But we could reduce the gap of these drawbacks by implementing a better platform for farmers and educate them on solutions for the drawback. When strategies are properly maintained, this would see a drastic change in our agriculture sector, improving the standard of living of the farmers. As discussed, when farmers are well taught about the usage of e-commerce which can be used in replacing the traditional equipment that results in drastic improvement in farming. In this pandemic, the government should take preventative measures and educate the farmers in using e-commerce for farming.

Authors' Contribution: We are happy that authors have contributed to the study in different ways at different times.

- P. Madhu Kumar Reddy: Theoretical background, Introduction, review of literature, and analysis of the data, Research methodology, data collection.
- Dr. A. Rama Kumar: Discussion of the results.

Conflict of Interest: The study is free with conflicts of interest in authors.

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APPENDICES

1. Name:

2. Gender:

- 1) Male []
- 2) Female []

3. Age:

- 1) 18-25 years []
- 2) 26-30 years []
- 3) 31-40 years []
- 4) 41-50 years []
- 5) 51-60 years []
- 6) 60+ years

4. Educational qualification

- 1) Post graduate []
- 2) Under graduate []
- 3) Secondary []
- 4) Primary []
- 5) Others []

5. Period of using online banking

- 1) Less than 1 year []
- 2) 1-2 years []
- 3) 2-3 years []
- 4) 3-4 years []
- 5) More than 4 years []

6. Marital Status

- 1) Married []
- 2) Unmarried []

7. E-commerce sources selected for agriculture sector

- 1) Amazon []
- 2) Flipkart []
- 3) Snapdeal []
- 4) Shopify []
- 5) eBay []
- 6) Others []

8. Reasons for using e-commerce in agriculture

- 1) Eradicate intermediaries []
- 2) Improves income to the farmers []
- 3) Decreases wastage []
- 4) Providing fresh products to the customers []

9. Overall satisfaction on utilization of e-commerce in the agriculture sector through covid-19

- 1) Very satisfied []
- 2) Satisfied []
- 3) Neutral []
- 4) Dissatisfied []

10. E-commerce

- 1) Buying of goods and services []
- 2) Selling of goods and services []
- 3) Reducing intermediaries []
- 4) Transmitting of funds []

11. Benefits to farmers through Covid-19

- 1) Decreased in farmers efforts []
- 2) Time-saving process []
- 3) Better marketing and exposure []
- 4) Sell products directly to the customers []

12. Limitations to farmers through Covid-19

- 1) High maintenance cost []
- 2) Lack of experts []
- 3) No proper market []
- 4) Shortage of suppliers []

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