



ADOPTION OF M-COMMERCE FOR AGROCHEMICAL PURCHASES BY FARMERS DURING COVID-19 IN MADHYA PRADESH

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Abstract: The pandemic situation of COVID-19 led to phases of lockdowns in the state of Madhya Pradesh, India. Everything could wait, but not agriculture. Hence the farmers adopted technology as a resource to overcome the farming challenges that the pandemic situation brought about. With strict norms of social distancing and limited mobility among the population, farmers went ahead to adopt mobile based technology for farm related decisions. The increased number of viral infections of COVID-19 made the farmers to adopt to various existing M-Commerce platforms for the purchase of agrochemicals during the onset of the season of Kharif 2020. The research attempts to study the impact of COVID-19 pandemic and lockdown that followed through, on the adoption of M-Commerce platforms for the purchase of agrochemicals like herbicides, nutrients, fungicides, insecticides and other chemicals for the farming of Kharif crops by farmers of Madhya Pradesh. The research study utilized simple survey of selected farmers who chose M-Commerce as a solution to their buying problems for agrochemicals. M-Commerce, due to its various advantages of being able to access the services from any location by the user, convenience and ease of use, completely abiding to the laws of social distancing and lockdown during the pandemic, grew abundantly amongst the farmers of Madhya Pradesh. The boom of 'Digital India' was experienced mainly during this pandemic struck time in the country. This behavioral shift of the farmers can be a potential growth factor of many startups jumping into agrochemical marketing using M-Commerce channel.

Index Terms - M-Commerce, COVID-19, Lockdown, Agriculture, Farmers, Agrochemicals.

I. INTRODUCTION

Lockdowns amid the COVID-19 paved way to adoption of technology amongst the farmers of Madhya Pradesh. Penetration of mobile phones in rural India is very much talked about, and the state of Madhya Pradesh is not behind. Agriculture dependent individuals are using mobile technology backed up with internet for taking decisions related to farming in the recent times. The nation witnessed an unforeseen pandemic in the year 2020 which not only brought several challenges to the lives of the agrarians, but also enabled them to adapt to a few changes in their lifestyle. Farmers very quickly adopted to technology and made the best use of the available resources with respect to agriculture.

Mobile phones have been the main form of communication to the people around us and with the pandemic striking the nation, information dissemination through mobile phones has led to the revolution in agricultural activities. Many stakeholders including the government bodies, agrochemical companies, consultants, sale points and research organizations used the medium of YouTube Live, WhatsApp video call, Face Book Live, Zoom, Cisco WebEx etc. to engage the farmers in various technical sessions, product information sharing, farming techniques, product launches, market information dissemination and various other interactive sessions during this pandemic of COVID-19 scenario in Madhya Pradesh.

M-Commerce, due to its various advantages of being able to access the services from any location by the user, convenience and ease of use, completely abiding to the laws of social distancing and lockdown during the pandemic, grew abundantly amongst the farmers of Madhya Pradesh. The boom of 'Digital India' was experienced mainly during this pandemic struck time in the country. This behavioral shift of the farmers can be a potential growth factor of many startups jumping into agrochemical marketing using M-Commerce channel.

II. LITERATURE REVIEW

Bhagat, V., and Sidhu, M. S. (2008). Migrant vegetable sellers in Ludhiana city: A Case Study. Indian Journal of Agricultural Marketing, 22(1), 1-12.

The researchers conducted a study on the vegetable sellers in Ludhiana city of Punjab state of India. These vegetable sellers were migrants from near by places located in Uttar Pradesh and Bihar states of India. The study conducted by the researchers tells us that the vegetable sellers came to Punjab state of India due to the economic distress that they faced in their native places. These migrant vegetable vendors, majorly from Uttar Pradesh and Bihar, faced economic problems in their native states that compelled them to move to the neighbouring states for work related earnings. The researchers investigated the type of shops or structures that these migrant vendors used to sell the vegetables in Ludhiana. The researchers conclude in their study that two per cent of the respondents had permanent shops for selling vegetables while 13 per cent had temporary shelters, 27 per cent had roadside 'rehri' and 15 per cent were mere hawkers. Along with the business conducted in these structures, the migrant vegetable vendors were involved in technology driven vegetable selling. The researchers indicate the adoption of a mobile application named 'ApniMandi' which is popular among the societies of Ludhiana. The researchers in their study conclude that 43 per cent of the migrant vegetable sellers were involved in engaging business in "ApniMandi".

Nazhat Kittur and Dr R K Jain. (2017). Interpretive Structural Modelling of Factors Representing Potential of M-Commerce in Agrochemical Marketing, International Science Congress Association

The researchers attempt to investigate the dimensions of the services provided by the M-Commerce platforms in agricultural input marketing. The study considers the opinions of the farmers involved in adoption of M-Commerce for purchasing various agricultural inputs for the cultivation of crops. Researchers studied the various dimensions of services that the M-commerce platforms in agricultural input marketing provide. The research concludes that that aesthetics, curiosity for new discovery, user friendliness, and cost are independent variables, however all of them are mutually related. Similarly ease of use, suitability and reliability are dependent variables, which depend on above four. In this manner in research work, relationship among different factors governing potential of M-commerce in agrochemical marketing in the country are investigated. The research work conducted by the researchers concludes if use of mobile phones for purchase of agricultural inputs using M-Commerce platforms by the farmers of the rural parts of the country is worth it. The study adopts ISM-Interpretive Structural Modelling of factors representing the potential of M-Commerce. The study displays how the responses and principal component analysis is used to examine the factors driving the use of M-Commerce. The study concludes that ease of use, sustainability, reliability, cost, aesthetics, user friendly and curiosity of new discovery are the factors driving the potential and adoption of M-Commerce in agricultural marketing in India. The study also derives the relationship between the identified factors.

Singh, S. and Islam, J., (2015) Emergence of M-Commerce in India, Advances in Economics and Business Management, Volume 2 , Number 5, Page 529-533

The researchers in the study attempt to investigate the M-Commerce scenario in India. The researchers draw the flow of their study by the support of e-commerce sector which witnessed a growth in the year 2014. The researchers attempt to signify the role of M-Commerce in India and its importance in the future business. The study indicates that more than nine billion mobile application downloads are expected in the country in the year 2015 thereby indicating that the country is one amongst the fastest growing mobile application markets. The researchers examine that the mobile applications display a great opportunity to businesses and can gain customers since there is huge increase of internet users using the services on smartphones. The researchers also indicate in their study that the decrease in mobile internet data will increase the rate of online shopping amongst the consumers. Also, the study emphasizes that the more the mobile companies are developed in the home country, the lesser the cost of the mobile devices available to the customers. This in turn, as suggested by the researchers, indicate a growth of smartphone users in the coming years, hence making M-Commerce more convenient to use by the Indian consumers. The researchers in their study conclude that the adoption of M-Commerce will change the way transactions are done and hence a revolution in doing business will be witnessed there by enabling more players to participate in the business and increased awareness amongst the consumers. The researchers indicate a transformation in the security line of M-Commerce for the better future of the sector. The study concludes that the adoption of M-Commerce in India will reduce the gap between the customers and the sellers. The researchers also conclude that the adoption of M-Commerce will enable customers located at remote locations to access goods and services on a wider range.

III. RESEARCH METHODOLOGY

3.1. Objective of the Research

The main objective of this research work is to understand the impact of COVID-19 pandemic and the lockdown on the adoption of M-Commerce for agrochemicals by the farmers of Madhya Pradesh.

3.2. Glimpses of the Research

Title	Adoption of M-Commerce for Agrochemical Purchases by Farmers during COVID-19 in Madhya Pradesh
Research Design	Descriptive
Population	Selected farmers of Madhya Pradesh
Sample Size	N=25
Sampling Technique	Probability Sampling Technique (Convenient Sampling)
Data Source and collection method	Primary data – Survey method
Data Collection Tool	Structured questionnaire with 5-point Likert scale
Research Tools	Regression Analysis and SPSS tool
Scope of the study	The study can be extended to other geographies of India. The study can be extended for M-Commerce companies by focusing on internal factors that affect the success of M-Commerce.

3.3. Hypothesis

The following hypothesis were formulated:

H₀ : There is no significant impact of COVID-19 pandemic and lockdown on adoption of M-Commerce for agrochemicals amongst Madhya Pradesh farmers

H₁ : There is a significant impact of COVID-19 pandemic and lockdown on adoption of M-Commerce for agrochemicals amongst Madhya Pradesh farmers

3.4. Limitation of the study

- The study has been conducted on a sample with selected participants comprising of the farmers from the state of Madhya Pradesh, India.
- The study has been limited to the initial period of the COVID-19 pandemic in India which is during the year 2020.

IV. DATA ANALYSIS AND INTERPRETATION

The responses received from the survey have been analyzed and presented in this section.

4.1. Demographic details of the respondents

Demographic details	Groups	Count
Gender	Male	25
	Female	0
Age (years)	18 to 25	8
	26 to 40	14
	41 to 55	2
	55 and Above	1
Education	< S.S.C	3
	< H.S.C	5
	Higher Education	17
Income p.a. (INR)	Less than 5,00,000	13
	5,00,000 to 10,00,000	9
	10,00,000 to 15,00,000	3
	Above 15,00,000	0
Agricultural land holding	<5 acres	3
	5-10 acres	8
	10-15 acres	9
	>15 acres	5

Table 1 Demographic details of the respondents

Interpretation: The respondents were male from different age groups, majority of which were from 26 to 40 years (56% of the respondents) followed by 18 to 25 years (32%), 41 to 55 years (8%) and 55 years and above (4%). The survey indicated that 68% of the respondents were possessing higher education than HSC level while 20% of them were below HSC level and 12% comprised of below SSC level of education. 52% of the farmers surveyed were earning less than 5 lakhs per annum, 36% were earning 5 to 10 lakhs per annum and 12% were earning 10 to 15 lakhs per annum. The respondents comprised of less than 5 acres (12%), 5 to 10 acres (32%), 10 to 15 acres (36%) and more than 15 acres (20%) of agricultural land holding.

4.2. Period of use of M-Commerce for purchasing agrochemicals by the respondents

Period of use	Count
Less than a year	9
1 year to 3 years	13
3 years to 5 years	3
More than 5 years	0
Total	25

Table 2 Period of use of M-Commerce for purchasing agrochemicals by the respondents

Interpretation: 36% of the respondents started using the M-Commerce platform for agrochemical purchasing very recently (less than a year) while 52% of the respondents were already using M-Commerce platforms since 1 to 3 years.

4.3. Type of products purchased by the respondents through M-Commerce in COVID-19

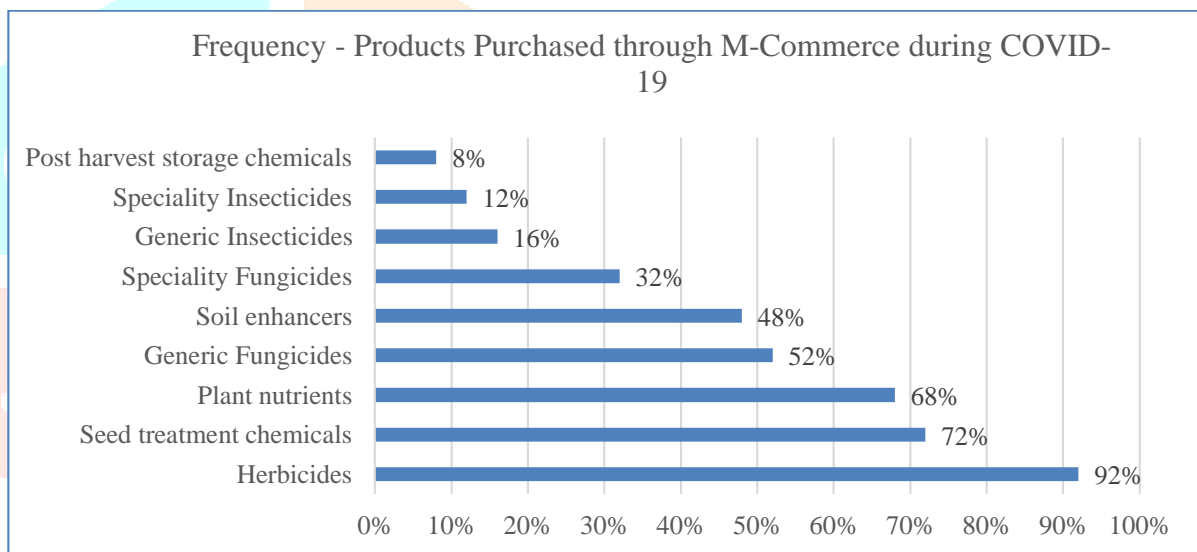


Figure 1 Type of products purchased by the respondents through M-Commerce in COVID-19

Interpretation: Majority of the farmers used M-Commerce platforms to purchase herbicides followed by seed treatment chemicals and plant nutrients during the pandemic COVID-19 scenario. This is mainly driven by the season which indicates sowing of a new crop and early monsoon received in the state.

4.4. Preference of using M-Commerce for agrochemical purchase in future by the respondents

Preference of M-Commerce in future purchase	Count
Do not prefer M-Commerce	2
Prefer M-Commerce	23
Total	25

Table 3 Preference of M-Commerce in future purchase

Interpretation: Majority of the farmers intend to use M-Commerce platforms to purchase agrochemicals in the future.

4.5. Advantages of M-Commerce for agrochemical purchase realized by the respondents

Sr. No	Advantage	1	2	3	4	5
A	Avoid Hassle				3	22
B	Save time & Energy					25
C	Cheaper Price		4	15	4	2
D	More Products are available				16	9
E	More Brands available				16	9
F	More quality of products				16	9
G	Ability to shop at any time					25
H	Home delivery					25
I	After Sales Service				6	19

(1=Strongly Disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly Agree)

Table 4 Advantages of M-Commerce realized by the respondents

Interpretation: Majority of the farmers indicated M-Commerce as time and energy saving, ease of shopping any time and home delivery during COVID-19 times effective from when agriculture came under essential commodities.

4.6. Mode of payment adopted by the respondents

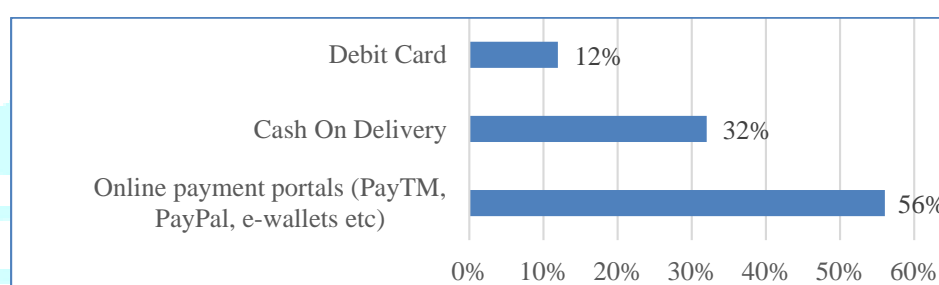


Figure 2 Payment methods adopted by the respondents

Interpretation: Majority of the farmers opted for online payment for their orders through online payment portals like PayTM, PayPal etc.

4.7. Enquiring if any problem was faced by the respondents during the purchase and future intention to continue the purchase

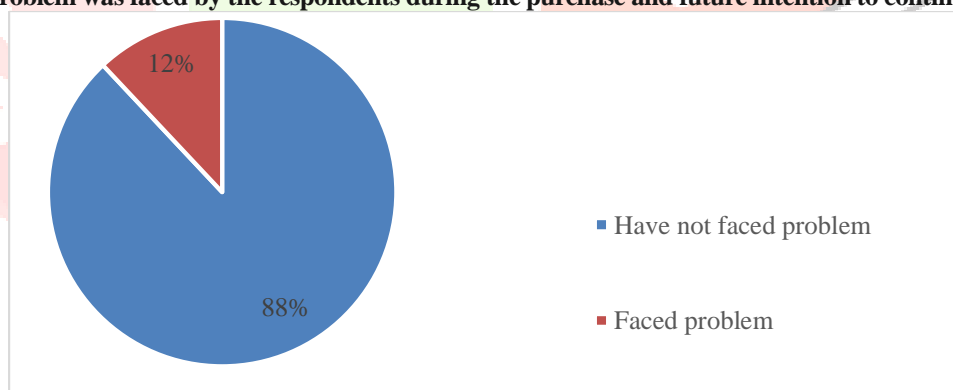


Figure 3 Problems faced by respondents

Interpretation: 12% of the respondents faced problem during the purchase through M-Commerce and when enquired indicated that the problems were – ‘desired product was not available’ and ‘ordered product which never arrived’. The respondents who faced the issues during the purchase were asked if they would continue to purchase from the same M-Commerce platform inspite of the problem, answered ‘yes’ and hence indicated the benefits of the technology.

4.8. Test of Hypothesis based on the data analyzed and interpreted

The hypothesis drawn is as below:

- H₀** : There is no significant impact of COVID-19 pandemic and lockdown on adoption of M-Commerce for agrochemicals amongst Madhya Pradesh farmers
- H₁** : There is a significant impact of COVID-19 pandemic and lockdown on adoption of M-Commerce for agrochemicals amongst Madhya Pradesh farmers

Considering the data analyzed in this research using SPSS the following test of hypothesis is applied and presented using regression analysis between COVID-19 pandemic situation and adoption of M-Commerce for purchasing agrochemicals by farmers of Madhya Pradesh.

Independent variable	R2	F value	Beta value	P value
COVID-19 on adoption of M-Commerce for agrochemical purchase	.632	1.721	.891	0.000

Table 5 Regression analysis between the factors

The analysis indicates that the COVID-19 pandemic and lockdown situation is significant and positively influences the adoption of M-Commerce in agrochemical purchase by the farmers of Madhya Pradesh.

V. CONCLUSION

The research concludes that the farming community is equipped with smartphones and agriculture is adopting technology. The COVID-19 pandemic situation that arose in the country led to lockdown to curb the number of diseased people in the country. The strict norms of limited mobility and social distancing caused the farmers and other stakeholders of the Indian agriculture to adopt to technology for various farming and sales/marketing activities. Adoption of M-Commerce rouse with these challenges and eased the process all together. Farmers started using M-Commerce for their agrochemical purchases thus avoiding physical contact with the market and safeguarding themselves from the pandemic COVID-19. This smart move was motivated by the startups involved in M-Commerce backed by various agrochemical giants in India.

