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Adapting to the pandemic: Appraisal of methods for online agricultural technology transfer in the context of COVID-19 pandemic

¹Arya PS and ²Sangeetha KG

¹Post Graduate, Department of Agricultural Extension, College of Agriculture Vellayani, Kerala Agricultural University, Thrissur, Kerala, India

²Training Service Scheme, College of Agriculture Vellayani, Kerala Agricultural University, Thrissur, Kerala, India

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Corresponding Author: Arya PS

Abstract

Agricultural technology transfer methods refer to the techniques used by an extension system for imparting agrarian information to the farming community. The COVID-19 pandemic has accelerated the adoption of digital technologies in agricultural extension, enabling farmers to access critical information and advisory services remotely. The study was conducted in Kerala among the farmers who received online training and extension personnel who conducted training. The data were collected from the respondents through personal interviews using a well-structured and pre-tested interview schedule. The objective was to appraise the methods adopted by the farmers and extension personnel for online agricultural technology transfer during the COVID-19 pandemic. Different methods used by farmers and extension personnel include digital devices, digital platforms and digital applications. More than 62 percent of the farmers and extension personnel used mobile phones for online agricultural technology transfer. Among the digital platforms, both farmers and extension personnel preferred Google Meet and Zoom. WhatsApp was the most used digital application by the respondents.

Keywords: Online technology transfer, digital methods, extension personnel, and farmers

Introduction

Technological changes and the adoption of improved agricultural techniques are important components in the development of any agrarian community. The COVID-19 pandemic has brought unprecedented disruptions to global food systems, highlighting the need for innovative and resilient approaches to agricultural technology transfer. As governments worldwide implemented lockdowns and social distancing measures, traditional face-to-face extension services were severely impacted, exacerbating the existing knowledge gap among farmers. Usage of online media is the key option for the extension personnel as well as farmers for effective agricultural technology transfer during this pandemic situation.

Agricultural technology transfer methods refer to the techniques used by an extension system for imparting agricultural information to the farming community. Information exchange links improved cognition and knowledge for all of the technologies and increased adoption of innovative technologies (Shikuku, 2019) [7]. Since the onset of COVID-19 pandemic, digital agriculture tools have enabled smallholder farmers to continue receiving advisory, acquire much-needed financing, receive inputs for their farms and identify new markets for their products (Arathoon *et al.*, 2021) [2]. Technology has almost taken every part of our life and is considered as pathbreaker. Even users from the remotest part of the world can access and learn updated learning material through e-learning

portals (Joshi and Dewangan, 2021) [4].

The choice of method depends on various factors such as the tenure system in the area, community organization and availability of resources (Anandajayasekeram *et al.*, 2008) [1]. Various stakeholders such as extensions, research organizations and development partners continue to play innovative roles in transferring new technology to agricultural producers but the change is very slow, limited and incomplete (Badiane, 2014) [3].

In response, agricultural extension systems rapidly adapted to the new reality, leveraging digital platforms to facilitate online technology transfer. This shift has enabled extension personnel to continue disseminating critical agricultural information, advising farmers on best practices, and supporting their decision-making processes despite physical distancing constraints. This study aims to investigate the methods adopted by farmers and extension personnel for online technology transfer during the COVID-19 pandemic.

Methodology

The study was conducted in Kerala during 2021-22 among the farmers who received online training and extension personnel who conducted training. The farmers who had undergone online training organized by public extension agencies such as Kerala Agricultural University and State Department of Agriculture constituting a total of 100 farmers were selected randomly. Also, 50 extension officials: 25 each from KAU and Department of

Agriculture, who had conducted online training for farmers were selected randomly. A total of 150 respondents comprising 100 farmers and 50 extension personnel, constitute the total sample size. The ex-post facto design was employed for the study. Different digital devices, digital platforms and web applications used by the farmers as well as extension personnel were identified based on the interaction and discussion with the respondents during the data collection using the questionnaire. The responses obtained were recorded on a five-point continuum scale viz., most often, often, sometimes, rarely and never were assigned scores of 5, 4, 3, 2 and 1 respectively. Distribution of respondents based on the frequency of use of online methods was analyzed using percentage analysis.

Results and Discussion

Methods adopted for online technology transfer

Various online methods have been used to transmit agricultural information to farmers. Different methods adopted by farmers and extension personnel for gaining agricultural information and transfer of agricultural technology include digital devices, digital platforms and digital applications.

1. Online methods used by farmers

a. Digital devices used by farmers

Digital devices are those devices that can receive, process and send digital information such as mobile phones, laptop, computers and tablets. Distribution of farmers based on the frequency of use of digital devices are presented in Table 1.

Table 1: Distribution of farmers based on the frequency of use of digital devices for online agricultural technology transfer N=100

Digital devices	Frequency of use									
	Never		Rarely		Sometimes		Often		Most often	
	F	%	F	%	F	%	F	%	F	%
Smartphone	2	2	1	1	2	2	33	33	62	62
Laptop	36	36	24	24	22	22	13	13	5	5
Desktop	68	68	16	16	7	7	4	4	5	5
Tablet	80	80	11	11	5	5	2	2	2	2
Smartphone+ laptop	48	48	28	28	16	16	7	7	1	1
Smartphone + desktop	73	73	13	13	4	4	7	7	1	1
Laptop + tablet	80	80	14	14	1	1	4	4	1	1
Desktop + tablet	85	85	8	8	2	2	4	4	1	1

The results presented in table 1 reveal the details of various digital devices used by farmers. The table shows that smartphone was the most common digital device used by all the respondents. Panda *et al.* (2019) [6] found that 90 percent of the farmers have access to mobile phones. That could be the reason why the respondents most often used smartphones for online agricultural technology transfer. 22 percent of the respondents indicated that they sometimes use a laptop to access information. Tablet and desktops were the least used digital devices by the farmers.

b. Digital platforms used by farmers

Digital platforms are the digital space that provides facilities for users to interact digitally. Distribution of farmers based on the frequency of use of different digital platforms are presented in table 2.

Table 2: Distribution of farmers based on the frequency of use of digital platforms for online agricultural technology transfer N=100

Digital platforms	Frequency of use									
	Never		Rarely		Sometimes		Often		Most often	
	F	%	F	%	F	%	F	%	F	%
Google meet	1	1	3	3	5	5	47	47	44	44
Zoom	20	20	19	19	29	29	25	25	7	7
Webex	75	75	10	10	11	11	4	4	0	0
Microsoft teams	79	79	14	14	4	4	3	3	0	0
KAU MOOC	57	57	29	29	11	11	2	2	1	1

Data from the table revealed that Google Meet was the digital platform which was used by the farmers most often, followed by Zoom. This might be because these applications can be applied easily by downloading in the smartphones. Majority of the respondents never used platforms like Webex, Microsoft teams and KAU MOOC.

Distribution according to frequency of use of Google meet and Zoom by farmers is given in table 3.

Table 3: Distribution based on frequency of use of Google meet and Zoom by farmers N=100

Frequency of digital platform used	F	%
Only Google Meet was used	25	25
Only Zoom was used	4	4
90% Google Meet and 10% Zoom were used	31	31
70% Google Meet and 30% Zoom were used	25	25
50% Google Meet and 50% Zoom were used	15	15
90% Zoom and 10% Google Meet were used	0	0
70% Zoom and 30% Google Meet were used	0	0

Table 3 indicates that 31 percent of the farmers opined that 90 percent Google Meet and 10 percent Zoom were used for attending online classes and training. 25 percent of the respondents used only Google Meet for the online classes. The reason for preferring Google Meet might be that it offers a more user-friendly interface which makes the users comfortable while attending online classes and trainings.

c. Digital applications used by farmers

Digital applications are any application software that can be used in a mobile phone, computer, laptop or tablet. These can be accessed from any digital device with internet connection. Distribution of farmers according to the use of digital applications are detailed in Table 4.

Table 4: Distribution of farmers according to the use of digital applications for online agricultural technology transfer N=100

Digital applications	Frequency of use									
	Never		Rarely		Sometimes		Often		Most often	
	F	%	F	%	F	%	F	%	F	%
WhatsApp	0	0	1	1	1	1	41	41	57	57
Facebook	11	11	12	12	34	34	34	34	9	9
Instagram	65	65	17	17	13	13	2	2	3	3
Telegram	35	35	42	42	17	17	3	3	3	3
Twitter	72	72	20	20	5	5	2	2	1	1
YouTube	0	0	2	2	30	30	43	43	25	25
Agri related apps	11	11	20	20	45	45	23	23	1	1

Among the digital applications, 57 percent of the respondents most often used WhatsApp followed by YouTube (25%) for agricultural technology transfer. The reason for selecting these applications for agricultural

technology transfer might be their popularity and ease of use compared to other digital applications.

2. Online methods used by extension personnel

a. Digital devices used by extension personnel

Distribution of extension personnel based on the frequency of use of digital devices are presented in table 5.

Table 5: Distribution of extension personnel based on the frequency of use of digital devices for online agricultural technology transfer N=50

Digital devices	Frequency of use									
	Never		Rarely		Sometimes		Often		Most often	
	F	%	F	%	F	%	F	%	F	%
Smartphone	0	0	0	0	6	12	13	26	31	62
Laptop	0	0	0	0	6	12	21	42	23	46
Desktop	2	4	14	28	16	32	8	16	10	20
Tablet	33	66	8	16	4	8	5	10	0	0
Smartphone+ laptop	2	4	7	14	18	36	23	46	0	0
Smartphone + desktop	11	22	8	16	18	30	10	20	6	12
Laptop + tablet	39	78	4	8	4	8	3	6	0	0
Desktop + tablet	36	72	11	22	3	6	0	0	0	0

Analysis of table 5 reveals that smartphones were used most often by 62 percent of the extension personnel. 46 percent of the respondents indicated that they most often use a laptop for taking online training and classes for farmers. A combination of smartphones and laptops has also been used often by most extension personnel for online agricultural technology transfer. Desktop and tablets were the least used digital devices among extension personnel also.

b. Digital platforms used by extension personnel

Distribution of extension personnel based on the frequency of use of digital platforms are presented in Table 6.

Table 6: Distribution of extension personnel based on the frequency of use of digital platforms for online agricultural technology transfer N=50

Digital platforms	Frequency of use									
	Never		Rarely		Sometimes		Often		Most often	
	F	%	F	%	F	%	F	%	F	%
Google meet	0	0	0	0	0	0	18	36	32	64
Zoom	0	0	1	2	17	34	24	48	8	16
Webex	9	18	20	40	15	30	6	12	0	0
Microsoft teams	19	38	25	50	6	12	0	0	0	0
KAU MOOC	12	24	15	30	20	40	1	2	2	4

Data from table 6 reveals that Google Meet was used most often by majority of the respondents (64%), followed by Zoom (16%). Majority of the respondents rarely used Webex, Microsoft teams and KAU MOOC.

Distribution according to the frequency of use of Google Meet and Zoom by extension personnel is given in Table 7.

Table 7: Distribution according to the frequency of use of Google Meet and Zoom by extension personnel N=50

Frequency of digital platform used	F	%
Only Google Meet was used	0	0
Only Zoom was used	0	0
90% Google Meet and 10% Zoom were used	22	44
70% Google Meet and 30% Zoom were used	23	46
50% Google Meet and 50% Zoom were used	5	10
90% Zoom and 10% Google Meet were used	0	0
70% Zoom and 30% Google Meet were used	0	0

Table 7 indicates that 46 percent of the extension personnel opined that 70 per cent Google Meet and 30 percent Zoom were used for taking online classes and trainings for farmers. 44 percent of the respondents used 90 percent Google Meet and 10 percent Zoom. 10 percent of the extension personnel used 50 percent Google Meet and 50 percent Zoom for online agricultural technology transfer.

c. Digital applications used by extension personnel

Distribution of extension personnel according to the use of digital applications are detailed in table 8.

Table 8: Distribution of extension personnel according to use of digital applications for online agricultural technology transfer n=50

Digital applications	Frequency of use									
	Never		Rarely		Sometimes		Often		Most often	
	F	%	F	%	F	%	F	%	F	%
WhatsApp	0	0	0	0	0	0	13	26	37	74
Facebook	4	8	10	20	8	16	21	42	7	14
Instagram	14	28	21	42	13	26	2	4	0	0
Telegram	15	30	5	10	22	44	6	12	2	4
Twitter	27	54	14	28	5	10	4	8	0	0
You tube	7	14	1	2	9	18	25	50	8	16
Agri related apps	10	20	14	28	24	48	2	4	0	0

Among the digital applications, WhatsApp was the most popularly used digital application among the respondents compared to Facebook, Instagram, telegram and Twitter. 74 percent of the respondents most often used WhatsApp for agricultural technology transfer. Majority of the respondents never used twitter, Instagram and telegram.

The findings regarding the different online methods used by extension personnel for agricultural technology transfer are in line with the results of Nyarko and Kozari (2021)^[5].

Conclusion

Various online methods have been used to transmit agricultural information to farmers. Different methods used by farmers and extension personnel include digital devices, digital platforms and digital applications. Among the digital devices, the smartphone was the most common digital device used by all the respondents. Tablet and desktops were the least used digital devices by the farmers. Results show that Google Meet was the digital platform that was used by the farmers most often, followed by Zoom. Most respondents never used platforms like Webex, Microsoft Teams and KAU MOOC. Among the digital applications, 57 percent of the respondents most often used WhatsApp followed by YouTube (25%) for agricultural technology transfer.

Results reveal that 62 percent of the extension personnel used smartphones most often. 46 percent of the respondents indicated that they most often use a laptop for taking online training and classes for farmers. A combination of smartphones and laptops has also been used often by most extension personnel for online agricultural technology transfer. Desktop and tablets were the least used digital devices among extension personnel also. Google Meet was used most often by the majority of the respondents (64%), followed by Zoom (16%). Majority of the respondents rarely used Webex, Microsoft Teams and KAU MOOC. Among the digital applications, WhatsApp was the most popularly used digital application among the respondents

compared to Facebook, Instagram, telegram and Twitter. 74 percent of the respondents most often used WhatsApp for agricultural technology transfer. Majority of the respondents never used Twitter, Instagram and Telegram.

References

1. Anandajayasekeram P, Puskur R, Sindu W, Hoekstra D. Concepts and practices in agricultural extension in developing countries: A source book. Washington, DC, USA: IFPRI (International Food Policy Research Institute); Nairobi, Kenya: ILRI (International Livestock Research Institute); 2008. p. 275.
2. Arathoon L, Raithatha R, Tricarico D. COVID-19: Accelerating the use of digital agriculture. [Online]. Available from: <https://gsma.com>. 2021.
3. Badiane O. Agriculture and structural transformation in Africa. In: Falcon P, Naylor RL, editors. *Frontiers in food policy: Perspectives on Sub-Saharan Africa*. Stanford, USA: Stanford Center on Food Security and the Environment; c2014. p. 1-43. [Online]. Available from: http://fsi.stanford.edu/publications/frontiers_in_food_policy_perspectives_on_subsaharan_africa [Accessed: 13 Dec 2022].
4. Joshi P, Dewangan D. Impact and development of online education (e-learning) in India. *J Contemp Issues Bus Gov*. 2021;27(1):3450-3458. [Online]. Available from: <https://cibg.org.au>.
5. Nyarko DA, Kozári J. Information and communication technologies (ICTs) usage among agricultural extension officers and its impact on extension delivery in Ghana. *J Saudi Soc Agric Sci*. 2021;20(3):164-172.
6. Panda S, Modak S, Devi YL, Das L, Pal PK, Nain MS. Access and usage of Information and Communication Technology (ICT) to accelerate farmers' income. *J Community Mobil Sustain Dev*. 2019;14(1):200-205.
7. Shikuku KM. Information exchange links, knowledge exposure, and adoption of agricultural technologies in northern Uganda. *World Dev*. 2019;115:94-106. <https://doi.org/10.1016/j.worlddev.2018.11.012>.