



## **ROLE OF WHATSAPP IN TRANSFER OF AGRICULTURAL TECHNOLOGY**

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### **Abstract:**

**Aims:** To study the role of WhatsApp in transfer of agricultural technology, to study the constraints faced by farmers while using WhatsApp, to obtain suggestions from the farmers to overcome the constraints.

**Study Design:** Ex-post facto research design was used for the study

**Place and Duration of Study:** Department of Agricultural Extension and Communication, MPKV, Rahuri, between August 2020 and July 2021.

**Methodology:** The present study was conducted under jurisdiction of two KVKs i.e. KVK, Bhabhleshwar and KVK, Dahigaon, Ahmednagar district of Maharashtra with sample size of 120 respondents from 12 WhatsApp groups. The data was collected on role of WhatsApp in transfer of agricultural technology, constraints and suggestions given by the farmers.

**Results:** As regards role of WhatsApp in transfer of agricultural technology it was observed that Out of total 120 respondents more than half of the respondents (50.83 %) had reported moderately important role of WhatsApp in transfer of agricultural technology, followed by highly important (33.34 %) and less important (15.83 %) role of WhatsApp in transfer of agricultural technology. The important constraints reported by majority of respondents regarding use of WhatsApp were farmers faced constraint of poor internet connectivity, messages authenticity, language problem, lack of time to check messages, Suggestions given by the farmers about constraints regarding use of WhatsApp were poor network problem should be resolved, while the other suggestions were, training must be arranged for proper use of smart phone and WhatsApp.

**Conclusion:** Farmers viewed WhatsApp as a 'easy' communication app that solved problems using audio-visuals and provided an on-time response during a crisis in their agriculture activities, according to the findings. Distractions and exposure to uncontrolled communications or material were two of the most serious problems that resulted from the use of WhatsApp. Regardless of its drawbacks, social media has proven to be a significant tool for pluralistic extension, bringing all participants in the Agriculture Information System together and making them shareholders in development.

**Key Words:** WhatsApp, Social Media, Agricultural Extension, Technology Dissemination; Digital Farming; mobile technology

### **1. Introduction:**

Since independence, India has witnessed significant rise in food grain production (green revolution), oilseeds (yellow revolution), milk (white revolution), fish (blue revolution), and fruits and vegetables (golden revolution). Now, India is approaching towards ICT revolution in agriculture. Most of the earlier revolutions were with the single objective of increasing production. The extension activity was limited to providing physical inputs such as fertilizers, seed, pesticides, etc. However, all this is undergoing a change. The extension efforts are now directed towards providing farmers with the familiarity with the market situations, so as to enable them to decide what to produce, in how and what way, at what time and wherever to sell. (India year book, 2012).

In developing countries like India ICT has played a significant role in transmission of technology. The policy framework for agricultural extension (Ministry of Agricultural and Farmers Welfare, Government of India, 2000) highlights the opportunity for Information and Communication Technologies (ICTs) to improve the quality and accelerate the transfer and exchange of information to farmers, and ICTs are given a high priority. History of ICT in Indian agriculture transformed through various phases. At first, farmers were introduced to the use of telegraphs and telephones through the simple expansion of early ICT. They provided reasonable methods for the widely dispersed farms to communicate with each other and with the nearest towns at a moment's notice if required. Then radio and television transformed the information sharing from one to one towards one to many. It became more suitable to the farmers to collect information about various agricultural technologies through various programmes on radio and television. Government started Kisan Vani on radio and DD Kisan on Television to transfer information about agricultural sector for reaching the unreached. In the beginning of 21st century, revolutionized innovation introduced which was called as mobile phones. Mobiles phones helped to

connect the farmers to the extension personals through SMS and Calling features. They truly transformed the ICT revolution. Then eventually internet came into action. Now internet became the fourth important need of humans after food, shelter and clothing. In the last decade connectivity had developed from 2G to 3G, 3G to 4G, 4G to 5G and now 5G to 6G. This development led to the birth of smart phones. Smart phones acted as boon to human community. It has changed everything. It helped to transform the extension services into more simple, realistic and innovative era. Audio, Video, Pdf, Text, Internet calling, etc. channelized the transfer of agricultural technology in more reliable way. These smart phones brought the social media into action. Now, social media apps and digital websites ruling the world of extension services. This ICT revolution brought Public-Private extension services in agricultural sectors.

WhatsApp was founded by Jan Koum and Brian Acton. More than 1 billion people in over 180 countries use WhatsApp in free and offers simple, secure, reliable messaging and calling, available on mobile phones all over the world. WhatsApp platform provides many services to users such as sharing images, audio and video media messages in addition to text messaging. It provides zero cost communication facility. Over 55 billion messages are sent by over 1 billion users every day on WhatsApp (WhatsApp.com). That is more than any other social networking site by order of several magnitudes. The advantage of using WhatsApp messenger is that it works on almost every smart phone.

According to the report of Ministry of Electronics and Information Technology (2021), in India WhatsApp have 530 million users which is the highest among all social media apps. These users include farming community too. Communication using WhatsApp Messenger can be done without any extra cost except the cost of getting internet connectivity. Even through its free calling, video call facility, the farmers can call and text to researchers and consumers to communicate with them. Using WhatsApp does not require learning about any new technology. It offers a simple and instantaneous way to communicate with other users. Moreover, the voice messaging feature allows people to communicate without having the knowledge of English. This can help rural people avail the benefits of social networking and internet. WhatsApp can be used in keeping ourselves informed about latest happenings around the world; current updates in the farming sector; latest government policies, schemes and subsidies; weather forecast; market value of farm produce; latest farm machines and technologies etc. By using WhatsApp, you can share information by just one click and send to many people using group chatting feature for some discussions related to any problems faced by the farmers related to farming. (Ghatore, 2019).

The current study generated much needed empirical data on the WhatsApp use by farmers for getting information related to farming. It will help in studying the information needs of the farmers through use of WhatsApp. This study would be helpful in developing future understanding and application of such technologies in agricultural extension system. By completing this research, an adequate assessment of constraints faced by farmer while using WhatsApp as an agricultural technology transfer tool will be supported to get suggestions. This study generated empirical data on the role of WhatsApp in transfer of agricultural technology to reach out the farming community, thus, narrowed the data gap in this area. The study is carried out with following objectives:

- To study the role of WhatsApp in transfer of agricultural technology,
- To study the constraints faced by farmers while using WhatsApp,
- To study suggestions given by the farmers to overcome the constraints.

## **2. Material and Methods:**

The present study was conducted in Rahata and Shevgaon tehsils of Ahmed nagar district of Maharashtra state. As 49 KVKs are in Maharashtra working under different extension agencies (Vikaspedia.in). Out of it, 17 KVKs are in operation in western Maharashtra. Out of the 17 KVKs, 4 are directly under administrative control of the MPKV, Rahuri. All this KVKs have active WhatsApp groups. Hence, this area was purposively selected for the study as maximum number of WhatsApp groups transferring agricultural technology were observed by the KVK Babhaleshwar and KVK Dahigaon. Both these KVKs using WhatsApp as an important ICT tool for transfer of agricultural technology. At present 10 WhatsApp Groups of farmers are functioning under KVK, Babhleshwar and 12 WhatsApp Groups of farmers are functioning under KVK Dahigaon. More than 1500 farmers are the members of these WhatsApp Groups in Rahata and Shevgaon tehsils of Ahmednagar district. Out of this, 5 WhatsApp Groups from KVK Babhaleshwar and 5 WhatsApp Groups from KVK, Dahigaon were selected for the study. To study the role of whatsapp an interview schedule was developed and responses were recorded on various continuum scale for each aspect and assigned scores. The farmers were personally interviewed and responses were collected on

- Member of WhatsApp groups
- WhatsApp usage duration
- Reading time of WhatsApp usage
- Daily usage of WhatsApp
- Form of WhatsApp messages
- Extent of Dissemination

- Timeliness of WhatsApp messages
- Applicability, Reliability and Creditability of WhatsApp messages
- Types of Agricultural technology transfer through WhatsApp
- Constraints and suggestions

The data thus collected was organized and tabulated using simple statistical method, tables and percentage.

### 3. Results and Discussion:

#### 3.1 Member of WhatsApp Groups:

The data represented in table 1 revealed that more than half i.e., 55.83 per cent of the farmers were the members of up to 2 WhatsApp Groups, followed by 29.17 per cent and 15.00 per cent of the farmers were the members of 3 to 5 and 6 & above WhatsApp Groups respectively. From this study it can be concluded that more than half of the total farmers were members of up to 2 WhatsApp Groups. The possible reason for this is farmers believed that rather than having many irrelevant WhatsApp Groups, less and relevant one helps to receive more information about agricultural technology. Hence, they kept only few relevant WhatsApp Groups for obtaining information.

Table 1: Member of WhatsApp Groups

S.No	Member of WhatsApp Groups	Frequency	Percent
1	Up to 2	67	55.83
2	3 to 5	35	29.17
3	6 & above	18	15
	Total	120	100

#### 3.2 WhatsApp Usage Duration:

The data represented in table 3.2 revealed the more than one third i.e., 37.50 per cent of the farmers are using WhatsApp since 1.1 to 2.0 years, 22.50 per cent of the farmers using WhatsApp for 6.1 months to 1.0 year, 17.50 per cent of the farmers were using WhatsApp for 2.1 years to 4.0 years, however, 15.00 per cent and 7.50 per cent of the farmers using WhatsApp since less than 6 months and more than 4.0 years respectively. The possible reason for this finding could be that most of the farmers started using WhatsApp for getting information about agricultural technology since last 1 to 2 years probably due to spread of affordable handsets, network connectivity to rural areas and COVID 19 situation.

Table 2: WhatsApp Usage Duration

S.No	WhatsApp Usage Duration	Frequency	Percent
1	Less than 6.0 months	18	15
2	6.1 months to 1.0 year	27	22.5
3	1.1 years to 2.0 years	45	37.5
4	2.1 years to 4.0 years	21	17.5
5	More than 4.0 years	9	7.5
	Total	120	100

#### 3.3 Reading Time of WhatsApp Messages:

Farmers read WhatsApp messages during different period of the day. The data represented in table 3 revealed that more than one third i.e., 40.00 per cent of the farmers read WhatsApp messages at their leisure time, however 29.17 per cent of the farmers read WhatsApp messages in the evening after coming from farm. 19.16 per cent of the farmers read WhatsApp regularly, as they feel it is important and 11.67 per cent of the farmers read WhatsApp in the morning before going to farm. This study helped to understand the convenience of farmer about reading WhatsApp messages.

Table 3: Reading Time of WhatsApp Messages

S.No	Statements	Frequency	Percent
1	In the morning before going to farm	14	11.67
2	At leisure time	48	40
3	In the evening after returning from farm	35	29.17
4	Regularly, as it is important	23	19.16
	Total	120	100

#### 3.4 Daily Usage of WhatsApp:

Daily Usage of WhatsApp is the total time spent by the respondents in a day. The data represented in table 4.14 revealed that more than half (59.17 per cent) of the farmer's Daily Usage of WhatsApp is from 16 minutes to 30 minutes, however 20.83 per cent of the farmer's daily usage of WhatsApp is up to 15 minutes. 15.83 per cent and 4.17 per cent of the farmer's daily usage of WhatsApp is from 31 minutes to 60 minutes and 61 & above respectively. This study helped to know the daily usage of WhatsApp usage of the farmers.

Table 4: Daily usage of WhatsApp

S.No	Daily Usage (in minutes)	Frequency	Percent
1	Up to 15	25	20.83
2	16 to 30	71	59.17
3	31 to 60	19	15.83
4	61 & above	5	4.17
	Total	120	100

### 3.5 Form of WhatsApp Messages:

Form of WhatsApp messages studied that in which form (PDF, image, audio, video, calls, etc.) do respondents get WhatsApp messages? Form of WhatsApp messages influences the role of WhatsApp in transfer of agricultural technology as farmers understand some form of messages very well. The data represented in table 5 reported that more than three-fourth i.e., 85.83 per cent of the farmers got text messages regularly, 35.00 per cent of the farmers got audio messages regularly, more than half (50.83 per cent) of the farmers got WhatsApp messages in the form of images regularly, more than one third (37.50 per cent) of the farmers got video messages regularly. 6.67 per cent of the farmers got WhatsApp calls regularly, 19.16 per cent of the farmers got WhatsApp calls occasionally. Nearly three-fourth (74.16 per cent) of the farmers never got information from WhatsApp calls. This study helped to know that major information is transferred to farmers through text messages, images, videos mostly. Nowadays videos are also shared on a large scale which are easier to understand. Such forms of WhatsApp messages should be promoted more. The possible reason behind these findings could be that earlier text messages were highly shared, by the farmers also. But nowadays, other forms such as audio, videos, pdfs, images, etc. are also sent by them to increase the applicability and understanding.

Table 5: Form of WhatsApp messages

S.No	Form of WhatsApp messages	Regular	Occasional	Never
1	Text	103	17	0
		-85.83	-14.17	0
2	Audio	42	23	55
		-35	-19.67	-45.83
3	Images	61	42	17
		-50.83	-35	-14.17
4	Video	45	52	23
		-37.5	-43.33	-19.17
5	Pdf, docx, etc.	19	37	64
		-15.84	-30.83	-53.33
6	WhatsApp Calls	8	23	89
		-6.67	-19.16	-74.16

(Figure in parentheses indicate the percentage)

### 3.6 Extent of Dissemination of WhatsApp Messages:

Farmers disseminate received information about agricultural technology to others farmers. The data in table 6 revealed that data represented in table 6 reported that nearly half (46.67 per cent) farmers sometimes shared the information with others farmers, nearly half (48.33 per cent) farmers never forwarded the information to other farmers through WhatsApp. The possible reason behind these results could be although mobile phone can help in disseminating agricultural information to improve the farm productivity and rural incomes, trustworthiness of information is one of the important aspects that need to be considered while delivering information to farmers to meet their needs and expectations.

Table 6: Extent of dissemination of WhatsApp messages

S.No	Statements	Always	Sometimes	Never
1	Sharing the information with others farmers	49	56	15
		-40.83	-46.67	-12.5
2	Forwarding the information to other farmers through WhatsApp	23	39	58
		-19.17	-32.5	-48.33

(Figure in parentheses indicate the percentage)

### 3.7 Timeliness of WhatsApp Messages:

Timeliness of agricultural information is very crucial to farmer's success. Farmers need to be provided with the information at the right time so as to apply that information in their farming activities for better farm productivity. The data represented in table 7 reported that three-fourth (75.00 per cent) of the farmers always get messages regarding solution of problems/curiosity on time, Nearly three-fourth (72.50 per cent) of the farmers always get messages regarding agriculture related information on time. More than half (56.67 per cent) of the farmers always get messages regarding experiences of experts shared on time. Nearly half (49.66 per cent) of the farmers always get messages regarding experiences of other farmers shared on time. More than half (53.33

per cent) of the farmers always discuss with experts from time to time. Farmers required information which will cater their needs on time. Hence timeliness of information shared is very important.

Table 7: Timeliness of WhatsApp messages

S.No	Statements	Always	Sometimes	Never
1	Timely problem solving/addressing	75	31	14
		-62.5	-25.83	-11.67
2	Timely sharing agriculture related information	87	29	4
		-72.5	-24.17	-3.33
3	Timely sharing of expert experiences	68	37	15
		-56.67	-30.83	-12.5
4	Timely sharing experiences of other farmers	59	42	19
		-49.66	-35	-15.83
5	Time to time discussion with experts	64	46	10
		-53.33	-38.33	-8.33

(Figure in parentheses indicate the percentage)

### 3.8 Applicability, Reliability and Creditability of WhatsApp Messages:

Relevant information is one of the key requirements for increased productivity and increased income to reduce poverty among food producers in underprivileged communities. The study addresses the relevance of information provided to farmers using WhatsApp. The data represented in table 8. reported that nearly three-fourth (74.17 percent) farmers thought content of messages was accurate always, more than half (51.67 per cent) farmers thought messages were timely available always, While, nearly three-fourth (71.67 per cent) of the farmers responded that messages were in easy and accurate language always,. More than half (52.50 per cent) of the farmers responded that messages were always easily understandable, more than one-third (43.33 per cent) of the farmers responded that they sometimes change agricultural practices according to the message received.

Table 8: Applicability, Reliability and Creditability of WhatsApp Messages

S.No	Statements	Always	Sometimes	Never
1	Accuracy of the content	89	23	8
		-74.17	-19.17	-6.67
2	Timely Availability	62	33	25
		-51.67	(27.50))	-20.83
3	Easy and accurate language	86	28	6
		-71.67	-23.33	-5
4	Fully understandable	63	34	23
		-52.5	-28.33	-19.67
5	Change in agricultural practices according to the message received	48	52	20
		-40	-43.33	-16.67

(Figure in parentheses indicate the percentage)

### 3.9 Type of Agricultural Technology Received by Farmer through WhatsApp Messages:

With the help of WhatsApp diverse information on agricultural technology is transferred to farmers. It includes different types of agricultural technologies. According to the need, season, problem information is shared. This study helped to know different types of agricultural technologies transferred to farmers. The data in table 9 represented the responses given by farmers for WhatsApp messages received.

Table 9: Type of Agricultural Technology Received by Farmer through WhatsApp messages

S.No	Types of Agricultural Technology	Response	
		Received	Not received
1	Weather information	96	24
		-80	-20
2	Seed and Sowing	80	40
		-66.67	-33.33
3	Integrated Nutrient Management	86	34
		-71.67	-28.33
4	Integrated Disease Management	77	43
		-64.17	-35.83
5	Integrated Pest Management	85	35
		-70.83	-29.17
6	Irrigation	94	26
		-78.33	-21.67
7	Integrated Weed Management	85	35

		-70.83	-29.17
8	Harvesting and Threshing	75	45
		-62.5	-37.5
9	Storage	87	33
		-72.5	-27.5
10	Marketing	90	30
		-75	-25
11	Animal Husbandry and Dairy	84	36
		-70	-30
12	Latest farm implements/machinery	78	42
		-65	-35
13	University developed innovations	68	52
		-56.67	-43.33
14	Water Conservation techniques	53	67
		-44.17	-55.83
15	Nursery Management	52	68
		-43.33	-56.67
16	Protected Cultivation	48	72
		-40	-60
17	Organic farming	32	88
		-26.67	-73.33
18	Precision farming	26	94
		-21.67	-78.33
19	Zero Budget Natural Farming	21	99
		-17.5	-82.5

(Figure in parentheses indicate the percentage)

### 3.10 Constraints and Suggestions:

#### 3.10.1 Constraints Faced by Farmers While Using WhatsApp:

Constraints in usage of novel technology never ends. However, they can be minimized. The data represented in table 10.1 showed that more than three-fourth (81.67 per cent) of the farmers faced constraint of poor internet connectivity. 73.33 per cent faced constraint of Messages Authenticity, More than two third (70.00 per cent) of the farmers reported that repetition of messages affects uses of WhatsApp for gathering agricultural information. The other constraints faced by farmers while using WhatsApp are Language problem (65.00), lack of time to check messages (59.17 per cent), lack of training skills for WhatsApp use (53.33 per cent), health issues such as headache, eyesight problem, etc (45.00 per cent), high cost of mobile phones (39.17 per cent), electricity problem for charging smart phone (35.00 per cent), difficulty in understanding new features of WhatsApp (29.17 per cent).

Table 10.1: Constraints faced by farmers while using WhatsApp

S.No	Statements	Frequency	Rank
1	Poor internet connectivity	98	I
		-81.67	
2	Messages authenticity	88	II
		-73.33	
3	Repetition of messages	84	III
		-70	
4	Language problem	78	IV
		-65	
5	Lack of time to check messages	71	V
		-59.17	
6	Lack of training for WhatsApp use	64	VI
		-53.33	
7	Health issues	54	VII
		-45	
8	High cost of mobile phones	47	VIII
		-39.17	
9	Electricity problem for charging smart phone	42	IX
		-35	
10	Difficulty in understanding new features of	35	X

	WhatsApp	-29.17	
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### 3.10.2 Suggestions Given by Farmers to Overcome the Constraints:

The respondents were requested to propose their valuable suggestions against constraints faced by them for making modifications to the WhatsApp use. The information regarding suggestions made by the respondents were collected and the findings are presented in Table. 10.2 More than 79.17 per cent farmers suggested to network problem should be solved, while the other suggestions were training must be arranged for proper use of smart phone and WhatsApp (69.17 per cent), information must be shared in local language (65.83 per cent), information must be shared on time (51.67 per cent), only relevant messages must be shared (43.33 per cent) and WhatsApp should be made more user friendly (40.00 per cent). WhatsApp can act as a game changer in transfer of agricultural technology in the field of extension and communication. Therefore, it is important to act on the basis of suggestions given by farmers.

Table 10.2: Suggestions given by farmers to overcome the constraints

S.No	Statements	Frequency	Rank
1	Network problem should be solved	95 -79.17	I
2	Training must be arranged for proper use of smart phone and WhatsApp	83 -69.17	II
3	Information must be shared in local language	79 -65.83	III
4	Information must be shared on time	62 -51.67	IV
5	Only relevant messages must be shared	52 -43.33	V
6	WhatsApp should be made more user friendly	48 -40	VI

### 4. Conclusion:

WhatsApp groups across India are not just linking farmers to their virtual market customers they're also developing a network of resources and support for the country's most vulnerable farmers. Farmers can also use WhatsApp to obtain information on farm operations, explain their uncertainties about plant/livestock disease signs, and get rapid access to market relevant information, according to the study. Farmers think that the WhatsApp messages utilised in the study were clear and suitable for them, indicating that the social media-enabled WhatsApp is helping them address farming-related difficulties more efficiently by making them digitally literate. WhatsApp isn't just a marketing tool for farmers; it's also turned into a kind of support network. The WhatsApp groups are helpful at offering a sounding board for support and inspiring farmers on a daily basis.

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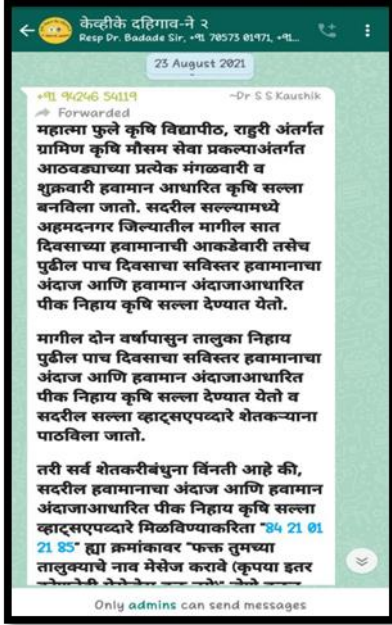
#### **6. Definitions, Acronyms, Abbreviations:**

%	:	per cent
Agril.	:	Agriculture
et al	:	Etalia (and other)
etc.	:	et cetra
Fig.	:	Figure
GDP	:	Gross Domestic Product
ha.	:	Hectare
i.e.	:	That is
ICT	:	Information and Communication Technology
IDM	:	Integrated Disease Management
IPM	:	Integrated Pest Management
IWM	:	Integrated Weed Management
J	:	Journal
KVK	:	Krishi Vigyan Kendra
n	:	frequency
No.	:	Number
PGI	:	Post Graduate Institute



Rs. : Rupees  
 SMS : Short Message Service  
 Sr. No. : Serial number  
 Unpub. : Unpublished  
 viz. : Videlicet (Namely)

**7. Appendix:**



Information regarding agricultural technology shared on WhatsApp Groups



Information regarding agricultural technology shared on WhatsApp Groups