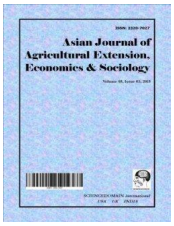

Asian Journal of Agricultural Extension, Economics & Sociology

26(4): 1-8, 2018; Article no.AJAEES.43582
ISSN: 2320-7027

WhatsApp Model for Farmer Led Extension: Linking Actors and Generating Localized Information for Farmers

Devesh Thakur[1*], Mahesh Chander[2] and Viveka Katoch[3]

[1]Department of Veterinary and AH Extension Education, CSKHPKV, Palampur, India.
[2]Division of Extension Education, ICAR-Indian Veterinary Research Institute, Izatnagar, India.
[3]Department of Vegetable Science and Floriculture, CSKHPKV, Palampur, India.

Authors' contributions

This work was carried out in collaboration between all authors. Author DT designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author MC supervised and guided the study. Author VK acted as expert in vegetables and crop related queries. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJAEES/2018/43582
Editor(s):
(1) Roxana Plesa, University of Petrosani, Romania.
Reviewers:
(1) Vilani Sachitra, University of Sri Jayewardenepura, Sri Lanka.
(2) Ezekia Svotwa, Chinhoyi University of Technology, Zimbabwe.
(3) Smita Vashishta, Dev Sanskriti Vishwavidalaya Haridwar, India.
Complete Peer review History: http://www.sciencedomain.org/review-history/25833

Original Research Article

Received 4th June 2018
Accepted 5th August 2018
Published 10th August 2018

ABSTRACT

Aims: This study aimed to explore the potential of using WhatsApp to enhance farm advisory services.
Study Design: Quasi-experimental design.
Place and Duration of the Study: The study was conducted in 8 districts of the State of Himachal Pradesh India, June 2016-December 2016.
Methodology: An experimental WhatsApp group involving 96 farmers was created across eight districts of Himachal Pradesh, India. The posting of messages and queries were examined for six months. Different types of farmer queries were responded with the support of subject matter specialists across various relevant agro enterprises.
Results: Over six month period, 442 posts were shared by farmers in the WhatsApp group. Of

**Corresponding author: E-mail: drdth4@gmail.com;*

these, 34.16 percent of posts pertained to the queries on agricultural problems faced by the respondents. This was followed by real life photos (20.59%), greetings (12.44%), irrelevant posts (7.47%). A total of 61 queries related to problems in crops and vegetables, 62 in animal husbandry, 19 in horticulture and 6 in floriculture were referred for advice through WhatsApp.

Conclusion: WhatsApp is an effective tool for real time farm advice and can serve as an important platform for sharing need based and demand driven farm extension information across the various farming enterprise.

Keywords: WhatsApp model; farmers led extension; agricultural queries; experimental evidence.

1. INTRODUCTION

The agricultural advisory services have largely followed vertical models of information transfer to the farmer clientele. Most of this information has been found to be less relevant and generic [1,2]. The reliance of farmer remains much higher on informal networks consisting of friends and family than the formal institutions. Participatory approaches have been recommended off late to reach out to the farmers. These approaches are more meaningful in capturing the essence of communication and information sharing among rural communities. They emphasize recipient involvement, co-presence, and participation as opposed to the linear vertical paradigms of development communication. There is a need to explore the tools which support such type of approaches. Social media tools such as WhatsApp enable greater user participation and feedback in agricultural extension activities [3]. The popularity of WhatsApp is high even in rural India as it is simple and to use and have low internet data requirements. These tools can emulate the preexisting dynamics of social relationships among rural communities by encouraging peer discussions and learning [4] and can even break down the rigid social and professional hierarchical structures that hinder reform in agricultural extension services [5]. Further, the benefit of such type of ICT tools cannot incur simply by ensuring their access and availability [6]. Often in the past, this approach of focusing on mere technology than community needs led to the failure of several ICT initiatives in the marginalized communities [7]. Socialization of ICT tools depends on the social construction of rural community in terms of their specific, potential and imaginary uses [8]. This involves amalgamation of ICT initiatives with social relationships in solving problems, achieving goals or purposes [9]. Under such situations, the role of rural intermediaries remains vital to facilitate access and use of ICT4D. These intermediaries provide an interface to rural users with low digital literacy skills and facilitate engagement between new information and communication technologies and marginalized community members and groups [10]. However, we do not find any well documented framework empirically tested for use in the farming community. In the present study, the researcher provided an intermediate link in explaining the concept of utilizing these tools among farmer clientele. The potential of this tool was showcased through sharing relevant farm information as well as offering timely advice to them by mobilizing various resource actors through social media. The current study tested a WhatsApp model involving farmers, extensionists and subject matter specialists drawn from relevant disciplines. The group messaging ability of this platform in form of photos, pictures and videos make it one of the cheapest multimedia messaging platforms. Not surprisingly, WhatsApp has become popular among smallholder farmers as well [11]. The following conditions were met:

1. Intermediation by the investigator to the farmers for mobile social media use in agriculture.
2. To ascertain the relevant information needs of target farmer participants.
3. To seek the support of various stakeholders such as relevant subject matter specialists of agriculture, animal husbandry, horticulture, floriculture from two state agricultural and horticultural university, state animal husbandry department, the state department of agriculture and *Krishi Vigyan Kendras*/Farm Science Centres.
4. To utilize the collective wisdom of the researchers and extensionists in responding to farmer's queries.

The experimental study generated sufficient empirical evidence to showcase the potential of this tool for generating farmer-centred information in agricultural advisory services. These pieces of evidence have been discussed in the paper.

2. MATERIALS AND METHODS

This experimental study was undertaken to utilise WhatsApp in the dissemination of agriculture related information among farmers in Himachal Pradesh. The internet usage of 28 percent in rural regions of Himachal Pradesh is one of the highest in India [12]. Eight out of twelve districts of Himachal Pradesh, India were selected, wherein; *Krishi Vigyan Kendras'* (KVKs') of State Agricultural University were located. The initial list of farmers using social media was prepared in consultation with officials of these KVKs. Subsequently, 12 farmers from each district were randomly selected. Thus, a total of 96 farmers across 8 districts were purposively selected. After initial arbitrary selection, extensive field visits to these respondents were conducted between April to June 2016. These visits were held to interview and explain the concept of WhatsApp use in agriculture. Consequently, a WhatsApp group entitled "*Unnat Krishi Avam Pashupalan*" was created in June 2016 [13]. Following group formation, information sharing pattern among group members was recorded and studied for six months.

3. RESULTS AND DISCUSSION

The users shared the substantial amount of content related to agriculture. The farmer members shared a total of 442 posts over six months. Out of these, 151 posts were in the form of questions about agricultural and animal husbandry related problems. This was followed by posts of original photos (91), greetings (51), irrelevant posts (33), pictures of farming (27). Besides, information was also shared as text messages, discussions on a topic, videos and video-links on farming. Queries on agricultural problems formed the most common types of posts shared in the group. Maximum queries pertained to animal husbandry (62), agriculture (61) followed by horticulture (20), floriculture (6) and forests (2). The nature of queries was a reflection of the largely diverse type of farming enterprises followed by farmers in the region. Out of 151 queries, 78 were accompanied by pictures which helped in better clarity and understanding the nature of the problem of the farmer. Queries seeking advice on poor crop growth, vegetable diseases and livestock diseases were accompanied by pictures (Fig. 1). Thus, utilization of WhatsApp in farming was well understood and received by the farmers. It can be concluded that WhatsApp can be successfully used to generate substantial user generated scientific information on agriculture and animal husbandry in a wide variety of formats.

3.1 The Pattern of Agricultural Queries across the Different Enterprise over Different Months

As evident from the Table 2, the maximum percentage of queries was received from animal husbandry (41.06%) followed by crop farming (40.40%), horticulture (13.25%) and floriculture (3.97%). Also, sizeable queries were asked based on the information shared by the investigator on animal husbandry. High proportions of farmers were engaged in vegetable cultivation and this might have been the reason for a large set of queries on vegetable farming (29.14%). One of the great advantages social media offers is the potential for greater

Table 1. Type of posts shared by farmers in WhatsApp group

Type of posts shared		Frequency (%)
i.	Queries on agricultural problems	151(34.16)
ii.	Original photos on farming	91(20.59)
iii.	Greetings/Inspirational messages	55(12.44)
iv.	Irrelevant posts(promotional, jokes, political news etc)	33(7.47)
v.	Pictures of farming	27(6.11)
vi.	Text messages on news notices etc.	27(6.11)
vii.	Text Messages on farming practices.	20(4.52)
viii.	Discussions and chats	15(3.39)
ix.	Videos on farming practices	6(1.36)
x.	Video links on farming	6(1.36)
xi.	Newspaper clippings on farming	4(0.90)
xii.	Selfies on farm fields	3(0.68)
xiii.	Videos on songs/jokes/general	3(0.68)
xiv.	Audio messages on farming	1(0.27)
Total posts		**442**

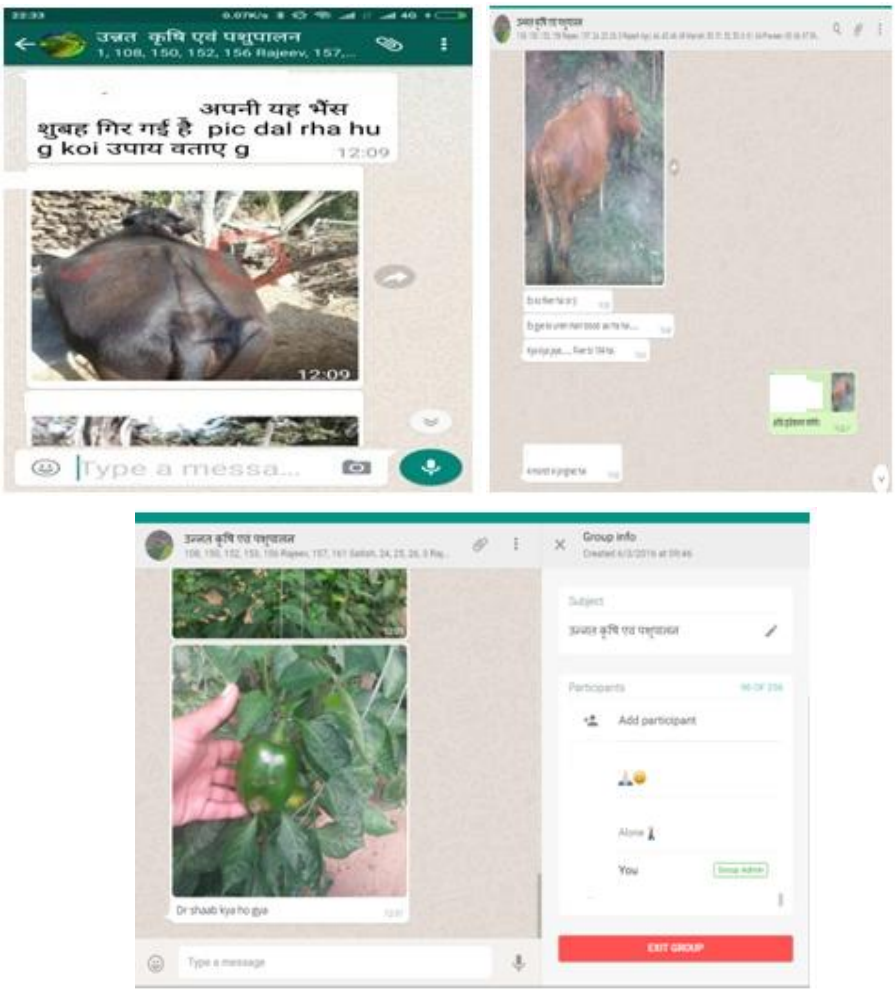

Fig. 1. A WhatsApp screenshot showing different types of communication and a potential for offering timely advice to the farmer

engagement because recipients can easily and immediately ask questions, share experiences, and provide feedback using the same social media technologies on which they received educational messages [14].

Overall, the group received a diverse set of queries in various fields of agriculture. This could be attributed to two important reasons. The first is that the group members were explained that the WhatsApp platform was meant to offer and receive holistic information in diverse fields. The second probable reason was that the farmers were engaged in different agriculture based enterprise.

Over six months, maximum queries were received in the months of July and August. This was more pronounced for vegetables. This might be due to a couple of reasons. The first may be due to prevalent vegetable season accompanied by rainy season which causes an increased incidence of crop problems in the region. The second reason may be the initial enthusiasm for using this platform for seeking agricultural advice.

3.2 The pattern of Queries on Subthemes of Agriculture and Allied Enterprises

As evident from Table 3, in animal husbandry, the maximum set of queries received pertained to animal feeding/breeding followed by animal health. This was an interesting finding and can be explained by a couple of factors. The first reason might be due to the fact that information delivery in animal feeding/ breeding is currently not well addressed by field veterinary personnel.

Most of them work as clinicians and cover animal health aspects paying less attention to animal feeding/breeding area. The farmers have limited opportunities to interact on breed suitability to their region and feeding of animals etc. The respondents might have explored WhatsApp to receive this uncatered area of animal production information. Another factor was that a good number of queries (6) were generated following some post on information sharing on animal feeding/breeding by the group administrator/ student researcher. Seeking advice and information on animal health has always been a priority for farmers. So, it was not surprising that it also received sizeable queries in animal health.

Table 2. Pattern of agricultural queries across the different enterprise over different months

Enterprise	June	July	August	September	October	November	Total F	Percentage
1. Animal husbandry	9	15	16	7	9	6	62	41.06
Dairy	8	13	13	7	7	4	52	34.44
Goat	1	1	3	0	0	0	5	3.31
Poultry	0	1	0	0	0	0	1	0.66
Dog	0	0	0	0	2	1	3	1.99
Pig	0	0	0	0	0	1	1	0.66
2. Crop farming	14	19	16	6	1	5	61	40.40
Crops	6	3	2	1	1	1	14	9.27
Vegetables	8	16	13	5	0	2	44	29.14
Mushroom	0	0	0	0	0	3	3	1.99
3. Horticulture	2	6	5	2	4	1	20	13.25
4. Floriculture	0	1	4	1	0	0	6	3.97
5. Miscellaneous	0	1	0	0	0	1	2	1.32
Total	**25**	**42**	**40**	**16**	**14**	**14**	**151**	

Table 3. Pattern of queries on subthemes of agriculture and allied enterprises

	June	July	August	September	October	November	Total
1. Animal Husbandry							
i. Animal feeding and breeding	3	8	6	2	4	3	26
ii. Animal health	5	5	4	3	5	2	24
iii. Government schemes and marketing of livestock	1	0	3	2	0	1	7
iv. Dairy processing and value addition	0	2	3	0	0	0	5
Sub Total	***9***	***15***	***16***	***7***	***9***	***6***	***62***
2. Agriculture							
i. Plant protection(Plant Pathology, Entomology, Nematology)	10	13	13	6	0	1	43
ii. Crop production(Seed science, Plant breeding, Soil health)	3	6	3	0	0	4	16
iii. Government schemes and marketing	1	0	0	0	1	0	2
Sub Total	***14***	***19***	***16***	***6***	***1***	***5***	***61***
3. Horticulture							
i. Fruit production	0	6	3	2	3	1	15
ii. Government schemes and marketing	2	0	1	0	1	0	4
Sub Total	**2**	**6**	**4**	**2**	**4**	**1**	**19**
4. Floriculture							
i. Floriculture	0	1	2	1	0	0	4
ii. Post harvest technology	0	0	2	0	0	0	2
Sub Total	**0**	**1**	**4**	**1**	**0**	**0**	**6**
5. Miscellenous							
i. Silviculture	0	0	0	0	0	1	1
ii. Contact details of SAU sale centre	0	1	0	0	0	0	1
Sub Total	**0**	**1**	**0**	**0**	**0**	**1**	**2**

In queries that referred livestock and crop diagnostic support, the queries were accompanied by pictures of diseased animals or plants. In other types of queries such as seeking information on input availability and information about government schemes, only text messages were sent. Thus, it can be concluded that the concept of WhatsApp as an ICT tool in agricultural extension was understood well by the majority of the respondents. The advantage of social media tools than other web based ICT tools is that acquiring basic skills in them are particularly easy to acquire for anyone with regular use of these tools [15].

Majority of the queries were posted in the group through a few members send them as individual messages to the administrator. These queries were then sent by the group administrator (investigator) to concerned experts who gave the solution through WhatsApp. Most of these advices helped farmers to choose suitable insecticides, herbicides, fertilizers and manuring practices to mitigate crop losses due to disease and poor growth. Similarly, need based advisories based on queries on the decision to whether use an available pesticide for a particular crop, decision about feeding practice for sick animals, immediate first aid medication during livestock diseases was helpful for the farmers. In a similar study, on the basis of messages received through WhatsApp, farmers in the majority of cases do follow advice on the selection of pesticides, insecticides, seed treatment etc [11].

Queries formed the bulk of posts shared by members through social media platform. These queries ranged from diverse subjects such as crop farming, vegetables and livestock health. Maximum percentage of queries was received on animal husbandry. Similarly, queries on plant protection were the highest. This indicates the strong potential of WhatsApp in addressing problems in these areas. Nevertheless, WhatsApp also emerged as a useful platform to queries that extended beyond disease management to feeding, management, input procurement (breed availability, plant material, rootstocks etc.).

3.3 Formation of Social Capital

The online interactions and discussions in the WhatsApp group enable farmers to form sound decisions and seek additional information and support from relevant actors. One of the discussions in the WhatsApp group led to an offline contact and discussion meeting among the farmers in the nearest KVK. This demonstrates the ability of WhatsApp to build a farmer extension interface through which there are greater farmer feedback and participation in the determination of research and extension priorities at the regional level. Such tools enable farmers in information exchange with other community members, pursuance of mutual interests (networking), seeking access to expert networks [16] and enables social empowerment [17].

Fig. 2. The potential of WhatsApp to support networking among the farmers

4. CONCLUSION

WhatsApp can be used to deliver demand based information to the farmers by solving their problems. Also, through photos, it is possible to know about the farming operations in the regions. This can keep the extensionists as well as researchers updated about agricultural developments at farmers' level. Thus, broadly such types of queries are likely to be expected from the farmers while managing a WhatsApp group for the farmers especially, in this region. Strategic and systematic social media (WhatsApp/Facebook) application can connect anyone with a smartphone with agricultural expertise and knowledge in real-time. It can also escalate networking among the farmers as well as with several actors across the agricultural value chain. This was observed as advice offered through specific queries through WhatsApp guided and encouraged owners to seek required institutional support.

ACKNOWLEDGEMENTS

The authors are thankful to Director, Indian Veterinary Research Institute for permission to conduct the doctoral study as well as Director Extension, CSKHPKV Palampur for providing necessary support to conduct the study. Also, support of all the resource persons of IVRI Izatnagar, CSKHPKV, Palampur and officers of State line departments of agriculture and animal husbandry of the State of Himachal Pradesh is also duly acknowledged.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Cole SA, Fernando AN. The value of advice: Evidence from mobile phone-based agricultural extension. Working Paper, Harvard Business School. 2012;13-47.
2. Glendenning CJ, Babu S, Asenso-Okyere K. Review of agricultural extension in India. Are Farmers Information Needs Being Met? 2010.
3. Andres D, Woodard J. Social media handbook for agricultural development practitioners, USAID Washington D.C. United States; 2013. Available:http://ictforag.org/toolkits/social/index.html#.Vrmq-1SF5dg ISBN: 0-89492-918-6.
4. Pimmer C, Tulenko K. The convergence of mobile and social media: Affordances and constraints of mobile networked communication for health workers in low and middle income countries. Mobile Media & Communication. 2015;4(2):252-269.
5. Abdul SS, Lin CW, Scholl J, Fernandez L L, Jian WS, Hsu MH, Li, YC. Facebook use leads to health-care reform in Taiwan. The Lancet. 2011;377(9783):2083-2084.
6. Watkins J, Tacchi J, Kiran MS. The role of intermediaries in the development of asynchronous rural access. In International Conference on Universal Access in Human-Computer Interaction. Springer, Berlin, Heidelberg. 2009;451-459.
7. Heeks R. Failure, success and improvisation of information systems projects in developing countries. Manchester: Institute for Development Policy and Management, University of Manchester; 2002.
8. Avilés JM, Larghi SB, Aguayo MAM. The informational life of the poor: A study of digital access in three Mexican towns. Telecommunications Policy. 2016;40(7): 661-672.
9. Thomas M, Narayan P. The role of participatory communication in tracking unreported reproductive tract issues in marginalized communities. Information Technology for Development. 2016;22(1): 117-133.
10. Watkins JJ, Tacchi JA. Participatory content creation for development: Principles and practices. UNESCO; 2008.
11. Naruka PS, Verma S, Sarangdevot SS, Pachauri CP, Kerketta S, Singh JP. Study on role of WhatsApp in agriculture value chains. Asian Journal of Agricultural Extension, Economics & Sociology. 2017; 20(1):1-11.
12. Jain N, Sanghi K. The rising connected consumer in Rural India. The Boston Consulting Group; 2016.
13. Thakur D. An expert backed WhatsApp group that works for farmers. Guest Blog, September 12, Global Forum on Agricultural Research, Rome; 2016.
14. Gualtieri L. The potential for social media to educate farm families about

health and safety for children. Journal of Agromedicine. 2012;17(2):232-239.
15. Bhattacharjee S, Saravanan R. Social media for agricultural extension. Extension Next, Bulletin No. 1, MANAGE, Hyderabad, India; 2017.
16. Stratigea A. ICTs for rural development: potential applications and barriers involved. Netcom. Réseaux, Communication Etterritoires. 2011;25**(**3-4):179-204.
17. Wallace C, Vincent K, Luguzan C, Townsend L, Beel D. Information technology and social cohesion: A tale of two villages. Journal of Rural Studies; 2016. In press.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history/25833