Journal of Global Communication
Vol. 11, No. 2, July-December 2018 : 145-151
DOI: 10.5958/0976-2442.2018.00019.8

Research Article

Farmers Attitude and Knowledge in Accessing aAQUA e-Agriservice in Maharashtra: A Critical Analysis

Sagar Kisan Wadkar[1]*, Asif Mohammad[2], Yogesh A. Garde[3] and Shivaji D. Argade[4]

[1]Assistant Professor, Centre for Management Education, Vaikunth Mehta National Institute of Cooperative Management, Pune, Maharashtra, India
[2]Scientist, ICAR-National Dairy Research Institute, Karnal, Haryana, India
[3]Assitant Professor, College of Agriculture, N.A.U., Waghai, Gujarat, India
[4]Scientist, ICAR-Central Institute of Fisheries Education, Mumbai Maharashtra, India

*Corresponding author email id: skwadkar@vamnicom.gov.in

Date of Receipt: 17-05-2018; Date of Acceptance: 13-09-2018

ABSTRACT

Information and Communication Technologies (ICTs) have potential to deliver timely and relevant information to farmers. Several projects integrate ICTs to disseminate the agricultural information to farming community. Almost All Questions Answered (aAQUA) e-Agriservice is one such web portal to address the queries raised by farmers. This study was carried out to find the attitude of farmers towards the aAQUA e-Agriservice and to assess its impact in terms of knowledge gain about Improved Dairy Farming Practices (IDFPs). The ex-post-facto research design was followed. The attitude scale and knowledge test were developed and administered to a sample of 120 each from user and non-user dairy farmers in four districts of Maharashtra state. Cronbach's alpha coefficient (α=0.91) of reliability test was employed for measuring the attitude of farmers. The results indicated that one-third (32.50%) of the users had more favourable attitude towards the e-Agriservice followed by 24.17% of the users with favourable attitude. About 47.50% of users had high level (67.72–78.29) of knowledge about IDFPs, whereas one-third (33.33%) of non-users had medium level (58.86–67.71). One way ANOVA revealed that the level of favourableness of attitude of the users towards e-Agriservice on knowledge levels of users about IDFPs found significant at 0.01% level of significance. The study suggested that the attitude of target clientele plays an important role in acceptance of ICT-based interventions which makes them knowledge empowered.

Keywords: aAQUA e-Agriservice, attitude scale, Cronbach's alpha, Improved dairy farming practices, Knowledge test, One-way ANOVA

INTRODUCTION

The importance of Information and Communication Technology (ICT) grows steadily for delivering knowledge (information) and advice as an input for scientific farming in tune with highly demand driven and knowledge intensive agriculture. With this changed scenario, the existing public extension system, finds difficult to meet the expectations of those involved in agricultural production for better access and use of improved farming practices (Mruthunjaya and Adhiguru, 2005).

A large numbers of initiatives has been made and are being made in rural India, to deploy ICT as a developmental tool for creating awareness among farming community for their betterment. Both public and private sectors have initiated many projects for enhancing the rural livelihoods and improving the status of agriculture in the country. Further to tackle the effects of climate change, ICT applications are imperative to disseminate context-specific knowledge at the right time (Mandal and Jirli, 2016). In this process few organisations succeeded and other have failed in

achieving the targeted outputs. Among these interventions that have made significant progress in taking message to the farming community-Almost All Questions Answered (aAQUA) e-Agriservice is one such ICT-based project has made history and considerable impact in different states of India among the farming community. It is the problem-solving system, where registered users can raise query by accessing the aAQUA web-portal and also can see the question-answer raised by the other farmers as well (Ramamritham *et al*., 2011).

The participation of private agencies and the use of ICT have substantially increased to meet the informational requirements of farming communities (Carney, 1995; Farrington, 1995; Rivera, 1996; Umali-Deininger, 1997). Hence, favourable attitude of farmers towards ICT-based services can be used as a component for effective and efficient extension programme planning and implementation to change agri-rural environment. Farmers' attitude, knowledge and competency have been identified as a vital indicators for the adoption of any technology (Chilonda and Van Huylenbroeck, 2001; Burton and Trevor *et al*, 2003; Barham *et al*., 2004), whereas its perceived utility, users satisfaction (Kumar *et al*., 2017) and willingness to pay (Mohammad *et al*., 2017) are deciding factors for its sustenance. Thus keeping above things in view, a study was conducted to analyse the reaction of the farmers towards the aAQUA e-Agriservice as a source of reliable and timely information about agricultural practices, especially dairy farming and knowledge gain of user group about Improved Dairy Farming Practices (IDFPs) due to utilisation of the aAQUA e-Agriservice.

MATERIAL AND METHODS

aAQUA e-Agriservice Project

aAQUA is the ICT intervention available in open access mode and has been used by different registered users across the country and its global visibility is increasing steadily. It was initiated in the Developmental Informatics Laboratory (DIL) at IIT-Mumbai during 2003 as a problem-solving system dedicated to finding solutions to problems posed by Indian farmers-small and large. It has the partners like Vigyan Ashram, Pabal; Krishi Vigyan Kendra, Baramati; ICRISAT, Patancheru, Hyderabad; University of Agri Sciences, Dharwad and its KVKs at Dharwad and Gulbarga; University of Pant Nagar and its KVKs at Kashipur and Dhakrani and University of Raichur and its KVKs. After completion of the project period from 2003 to 2006, all rights of the e-Agriservice are reserved with the *Agrocom Software Technologies Pvt Ltd,* Mumbai. The KVK-Baramati is providing the subject knowledge and solves the queries raised by the registered users by accessing web portal at common service centres (CSCs), cyber cafes or by using personal desktop. The *Agrocom* provides the technical backstopping to the web-portal.

Area Description

The Maharashtra state was purposively selected for the study as the aAQUA e-Agriservice was initially launched in this state during 2003 and has covered a maximum number of registered users of aAQUA. The study was conducted in randomly selected four districts (*Pune, Nasik, Jalna and Amravati*) out of eight pilot districts of Maharashtra, India. The one block with registered users and one without registered users were selected randomly. The factors like, socio-economic characteristics and infrastructure availability was kept in mind while selecting the block for non-users group category. This way the study was covered total eight blocks. The block-wise list of registered users was obtained from the service provider (*Agrocom Software Technologies Pvt. Ltd.*). The non-user dairy farmers list was obtained from concerned block level department of agriculture. Block-wise 30 each from users and non-users group, respondents were selected randomly giving a total of 60 respondents from each district for the purpose of research. Thus, total 240 (120 each from user and non-user group) respondents were selected randomly from four districts.

Techniques

In this study, two data collection tools were developed. Firstly, to measure the attitude of the users towards the e-Agriservice, the attitude scale was developed using a *Likert's* summated rating scaling technique. One benefit of the summated scale is its ability to represent the multiple aspects of a concept in a single measure (Hair *et al*., 2006). It consists of 22-items (12 positive and 10 negative items) and responses were taken based on 5-point continuum

scale. Cronbach's alpha coefficient (α=0.91) of reliability test was measured, which indicates a good internal consistency among set of items. Secondly, to assess the impact of the aAQUA e-Agriservice, the knowledge test about IDFPs was developed by using the procedure described by Lindquist (1951). It consists of 29-questions/ items covering the breeding, feed-fodder, health care and management aspects of the IDFPs. Difference in knowledge gain about the IDFPs among the users and non-users group was used as an indicator of impact of the aAQUA e-Agriservice. The individual farmer score ranged from 29 to 87. Data were solicited through personal interview method by using developed tools. The data thus generated were computed and analysed by appropriate statistical method.

RESULT AND DISCUSSION

Attitude of the Dairy Farmers towards the e-Agriservice

Users' attitude was operationalized as 'a predisposition to respond favourably or unfavourably to the aAQUA e-Agriservice, especially its application, service provider or a process related in utilisation of the system'. The response of the farmers on 22 items summed up to get cumulative attitude score of individual user farmer. The users' score were classified under five categories viz., *Very Less Favourable, Less Favourable, Favourable, More Favourable and Most Favourable* attitude using Cumulative Square Root Frequency (CSRF) method (Dalenius and Hodges, 1959). Table 1 depicts the results of the users' attitude towards the e-Agriservice.

About one-third (32.50%) of the users had more favourable attitude (86.61–95.03) towards the e-Agriservice followed by 24.17% of the users with favourable attitude (Table 1). Only 10.00% of the users had very less favourable attitude towards the e-Agriservice. One of the reasons for the favourable attitude was timely delivery of information on agriculture and allied sector, especially on dairy farming. It was perceived by the users that information related to breeding, feeding, fodder production, health care and management in general and queries like feed recommendation to increase milk production, construction and maintenance of cattle shed, clean milk production and intensive fodder cultivation and varieties in particular were handled well by the e-Agriservice.

Table 1: Distribution of Users Based on Level of Attitude towards the e-Agriservice (n=120)

Category	Range	Frequency	Percentage
Very Less Favourable	<59.89	12	10.00
Less Favourable	59.90–76.36	23	19.16
Favourable	76.37–86.60	29	24.17
More Favourable	86.61–95.03	39	32.50
Most Favourable	> 95.04	17	14.17

The users also reported that the e-Agriservice is capable to solve farmers query within time limit as compared with other sources, which empowered them and made self-independent. Further it was reported that, the users got the current market prices and weather report through this web portal, which helped them for proper farm planning. These could be the possible reasons for their positive attitude towards the e-Agriservice. The only 29.17% users had very less to less favourable attitude (below 76.36), were due to lack of accessibility of Internet, slow Internet connectivity and unrelated answers/solutions to their queries.

The perusal of Table 1 also indicated that about 46.67% of the users belonged to more to most favourable attitude (above 86.61) towards the e-Agriservice. It made the farming so convenient due to easy accessibility of information. Therefore, the users possessed strong positive attitude towards the aAQUA e-Agriservice. The young generation also reported that, they used to get information on starting any agro-venture with its related services. Another reason might be, the query raised by any user can be viewable to other farmers as well, which broadens the horizon of users. This could be the possible reasons for strong preference of the aAQUA e-Agriservice in the study area. The aAQUA e-Agriservice is the project that solves problems of farmers literally at the click of a mouse. Thus, it could be justified from the overall result that, the aAQUA e-Agriservice had created a good impact on the registered users.

The above findings were in line with the findings of Jain *et al*. (2011) revealed that 85% men and 54.4% women had favourable attitude towards e-Choupal and Dhaka and

Chayal (2010) showed that majority of the farmers had favourable attitude towards the Information Technology.

Knowledge Level of Respondents about IDFPs

Knowledge is the fact or condition of being aware of something or familiarity gained through experience or association. The response of the respondents on 23 items summed up to get cumulative knowledge score of individual respondent. The respondents' knowledge scores were classified in five categories viz., *Very* Low*, Low, Medium, High and Very High* knowledge level using Cumulative Square Root Frequency (CSRF) method.

Table 2 revealed that about 47.50% of users had high level (67.72–78.29) of knowledge about IDFPs followed by the medium level (27.50%). More than one-third (33.34%) of non-users had medium level (58.86–67.71) followed by 30.83% belonged to high level of knowledge about IDFPs. This may be due to users frequently visiting to the aAQUA web-portal. The users also get month-wise package of practices from web portal and thereby increases the knowledge level of the user group. The non-users also had better contact with extension workers, private extension agencies and good mass media exposure. Also the user group get relevant information to solve their queries immediately, which leads to high level of knowledge as compared to non-users group.

It was further observed that only 9.17% of users were found in low level of knowledge as compared with the non-users (15.83%). The users get timely and relevant information as and when it needed, instead of depend on different sources as in the case of non-users. These findings were in consonance with the findings of Kumar *et al*. (2011), who revealed that majority of dairy farmers had medium to high knowledge on different component of scientific dairy farming practices and Singh *et al*. (1979), who reported that most of the dairy farmers had high level of knowledge on scientific dairy farming practices. The findings are also in line with Biswas *et al*. (2012), who revealed that the overall knowledge gain of SHG farmers in IDFPs is quite better than that of Non-SHG farmers due to their efficient training orientation, raised literacy level, Market orientation and Farm Power.

Table 2: Distribution of the Users and Non-Users of the e-Agriservice According to Their Knowledge Level about IDFPs

Knowledge level	Knowledge Index	Users (n=120)	Non-users (n=120)
Very Low	< 52.23	11(9.17)	19(15.83)
Low	52.24–58.85	13(10.83)	21(17.50)
Medium	58.86–67.71	33(27.50)	40(33.34)
High	67.72–78.29	57(47.50)	37(30.83)
Very High	> 78.30	6(5.00)	3(2.50)

Note: Figures in parenthesis shows the percentage

One-Way Knowledge Scores by Levels of Attitude of Users towards the e-Agriservice

A one-way analysis of variance was conducted to explore the impact of levels of attitude of the users towards e-Agriservice on knowledge levels of users about IDFPs. The attitude score of the users (n=120) was used as subject and divided into five groups according to their level of favourable attitude (Group 1: Very Less Favourable; Group 2: Less Favourable; Group 3: Favourable; Group 4: More Favourable; Group 5: Most Favourable). Means and standard deviations comparing users' attitude levels are shown at Table 3.

Table 3: Means and Standard Deviations Comparing Users' Attitude

Attitude	Users KI		
	N	Mean	SD
Very Less Favourable	12	54.98	9.56
Less Favourable	23	59.77	6.13
Favourable	29	64.37	7.37
More Favourable	39	72.06	3.89
Most Favourable	17	72.48	8.92
Total	120	66.20	9.06

Table 3 indicates that at five different levels of attitude continuum, how the number of users (n=120) fell in with the mean knowledge index score and the standard deviation in the mean score varies. It was observed that most favourable user's attitude having 72.48 mean with 8.92 SD. More favourable user's attitude having very low SD, that is, 3.89. Further comparison of users mean score was done by using ANOVA table. The results of ANOVA analysis is presented in Table 4.

From Table 4, it was observed that between groups 'effect' found significant at 1% level of significance. This indicated

Table 4: Comparisons of Users Mean Scores According to Their Attitude towards the aAQUA e-Agriservice

Users KI	df	Sum of Squares	Mean Square	F
Between groups	4	4567.939	1141.985	25.24**
Within groups	115	5203.121	45.245	
Total	119	9771.060		

**Significant at 1% level of significance

Table 5: Post Hoc Test

Multiple Comparisons							
Dependent Variable: Users KI							
	(I) Attitude	(J) Attitude	Mean differences (I-J)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Tukey HSD	1	2	-4.78960	2.39531	.273	-11.4283	1.8491
		3	-9.38813*	2.30879	.001	-15.7870	-2.9892
		4	-17.07840*	2.22047	.000	-23.2325	-10.9243
		5	-17.49975*	2.53610	.000	-24.5287	-10.4709
	2	1	4.78960	2.39531	.273	-1.8491	11.4283
		3	-4.59853	1.87811	.110	-9.8038	.6067
		4	-12.28880*	1.76841	.000	-17.1900	-7.3876
		5	-12.71015*	2.15142	.000	-18.6729	-6.7474
	3	1	9.38813*	2.30879	.001	2.9892	15.7870
		2	4.59853	1.87811	.110	-.6067	9.8038
		4	-7.69027*	1.64932	.000	-12.2614	-3.1191
		5	-8.11162*	2.05465	.001	-13.8062	-2.4171
	4	1	17.07840*	2.22047	.000	10.9243	23.2325
		2	12.28880*	1.76841	.000	7.3876	17.1900
		3	7.69027*	1.64932	.000	3.1191	12.2614
		5	-.42136	1.95488	1.000	-5.8394	4.9967
	5	1	17.49975*	2.53610	.000	10.4709	24.5287
		2	12.71015*	2.15142	.000	6.7474	18.6729
		3	8.11162*	2.05465	.001	2.4171	13.8062
		4	.42136	1.95488	1.000	-4.9967	5.8394

that at the five levels of attitude the knowledge level of users differ significantly. Post-hoc comparisons using the Tukey HSD test was done for finding most significant users attitude towards the e-Agriservice the knowledge level of the user about IDFPs varies substantially. Tukey HSD test observed that Most Favourable and More Favourable user's attitude found significant over Very Less Favourable, Less Favourable and Favourable user's attitude. It was also observed through the calculation of Many author reported that, information use has increasingly become important for effective decision-making by the farming community (Cash, 2001; Galloway and Mochrie, 2005; Opara, 2008; Taragola and Van Lierde, 2010). In this context, farmers' attitude, knowledge and experience are especially important for effective usage of ICT for farming purpose. Because, generative learning begins at the knowledge stage of diffusion, which is the first stage (Rogers, 2003). In this study, the aAQUA e-Agriservice did create significant difference in the knowledge level of the users about the IDFPs. More inclination towards ICT by the farmers shows the effectiveness of the ICT in upbringing of knowledge of the farmers. Hence, study suggested the integration of ICT in extension system for readily and timely supply of information to make farming

community knowledge intensive. Ajayi (2013) also found the same result in his study that farmers' attitude on ICT-based farming are most likely to be positive if their level of knowledge are found satisfactory and relevant to their need.

CONCLUSION

The study conducted to understand the attitude of the users towards the aAQUA e-Agriservice and assess its impact in terms of knowledge gain among the users and non-users group. The users had more favourable attitude towards the aAQUA e-Agriservice. This process also resulted in a significant difference in the knowledge level of users and non-users group indicating that favourable attitude towards the aAQUA e-Agriservice increases the knowledge level of users. Thus, the government should focus on ICT-based technological interventions for speedy and location-driven dissemination of information and knowledge. The study suggested that the favourable attitude of farmers towards any technological intervention is the crucial behavioural component in accepting or rejecting any technology and making it sustainable.

ACKNOWLEDGEMENT

The author acknowledges the University Grant Commission (UGC), Government of India for financial support to carry out research work. The Award letter number and date: F.15-6 (DEC., 2011)/2012(NET) and 30th July, 2012.

REFERENCES

Ajayi AO, Alabi OS and Akinsola TO, 2013. Knowledge and perception of extension agents on Information and Communication Technologies (ICTs) use in extension service delivery in Ondo state, Nigeria. *African Journal of Agricultural Research*, Vol. 8, No. 48, pp. 6226–6233.

Barham BL, Foltz JD, Smith DJ and Moon S, 2004. The dynamics of agricultural biotechnology adoption: Lessons from rBST use in Wisconsin, 1994–2001. *American Agricultural Economics Association*, Vol. 86, pp. 61–72.

Biswas S, Sikdar DP and Goswami A, 2012. Study on comparative knowledge level about improved dairy farming practices of SHG & Non-SHG members in West Bengal. *Indian Research Journal Extension Education*, Vol. 12, No. 1, pp. 104–109.

Burton MR and Trevor Y, 2003. Modelling the adoption of organic horticultural technology in the UK using Duration Analysis. *The Australian Journal of Agricultural and Resource Economics*, Vol. 47, pp. 29–54.

Carney D, 1995. The changing public role in services to agriculture: a framework for analysis. *Food Policy*, Vol. 20, pp. 521–528.

Cash DW, 2001. In order to aid in diffusing useful and practical information: agricultural extension and boundary organizations. *Science Technology and Human Values*, Vol. 26, pp. 431–453.

Chilonda P and Van Huylenbroecj G, 2001. Attitude towards and uptake of veterinary services by small-scale cattle farmers in Eastern Province Zambia. *Outlook on Agricultural*, Vol. 30, pp. 231–218.

Dalenius T and Hodges JL Jr, 1959. Minimum variance stratification. *Journal of the American Statistical Association*, Vol. 54, pp. 88–101.

Dhaka BL and Chayal K, 2010. Farmers' experience with ICTs on transfer of technology in changing Agri-rural environment. *Indian Research Journal of Extension Education*, Vol. 10, No. 3, pp. 114–118.

Farrington J, 1995. The changing public role in agricultural extension. *Food Policy*, Vol. 20, No. 6, pp. 537–544.

Galloway L and Mochrie R, 2005. The use of ICT in rural firms: a policy-orientated literature review, *Journal of Policy, Regulation and Strategy for Telecommunications*, Vol. 7, pp. 33–46.

Hair JF Jr, Black WC, Babin BJ, Anderson RE and Tatham RL, 2006. *Multivariate data analysis*, 6th edn. Upper Saddle River, NJ: Pearson Education, Inc.

Jain S, Solanki D and Gupta M, 2011. Attitude of rural people towards E-Choupal. *Rajasthan Journal of Extension Education*, Vol. 19, pp. 30–33.

Kumar S, Kumar B, Hindustani S and Sankhala G, 2011. Knowledge level of dairy farmers in operational area of Krishi Vigyan Kendra about improved dairy farming practices. *Research Journal of Agricultural Sciences*, Vol. 2, No. 1, pp. 122–124.

Kumar S, Sangeetha V, Singh P, Burman R and Bhowmik A, 2017. Perceived utility and users' satisfaction about information provided by Rice Knowledge Management Portal (RKMP). *Journal of Global Communication*, Vol. 10, No. 2, pp. 122–127.

Lindquist EF, 1951. *Educational measurements*, Part-II. Washington, DC: American Council of Education.

Mandal PK and Jirli KB, 2016. Role of Information and Communication Technologies in rural development. *Journal of Global Communication*, Vol. 9, pp. 129–133.

Mohammad A, Chatterjee A, Bhakat C, Dutta S, Dutta TK, 2017. Deciphering the status of willingness to pay for mobile SMS by different categories of farmers: a dairy farming perspective. *Journal of Global Communication*, Vol. 10, No. 2, pp. 79–83.

Mruthunjaya and Adhiguru A, 2005. ICT for livelihood security: a reality check. *Mainstreaming Information and Communication Technologies*, Vol. II, No. 2, pp. 14–18.

Opara UN, 2008. Agricultural information sources used by farmers in Imo State, Nigeria. *Information Development*, Vol. 24, No. 4, pp. 289–295.

Ramamritham K, Bahuman C and Bahuman A, 2011. aAQUA: ICT-enabled knowledge services to farmers in India. In: Hazelman M and Attaluri S, editor. *Success stories on ICT/ICM in AR4D in Asia and the Pacific Region*. FAO and APAARI, Bangkok, Thailand. Pp. 1 – 22.

Rivera WM, 1996. Agricultural extension in transition worldwide: structural, financial and managerial strategies for improving agricultural extension. *Public Administration and Development*, Vol. 16, pp. 151–161.

Rogers EM, 2003. *Diffusion of innovations*, 5th edn. New York, London: Free Press.

Singh JN, Sinha BP and Verma AK, 1979. Factors affecting adoption of artificial insemination. *Indian Journal of Extension Education*, Vol. 15, No. 1&2, pp. 55–62.

Taragola NM and Van Lierde DF, 2010. Factors affecting the internet behaviour of horticultural growers in Flanders, Belgium. *Computers and Electronics in Agriculture*, Vol. 70, No. 2, pp. 369–379.

Umali-Deininger D, 1997. Public and private agricultural extension: partners or rivals? *The World Bank Research Observer*, Vol. 12, pp. 203–224.

https://aaqua.persistent.co.in/aaqua/forum/index

http://www.agrocom.co.in

How to cite this article: Sagar Kisan Wadkar, Asif Mohammad, Yogesh A. Garde and Shivaji D. Argade, 2018. Farmers Attitude and Knowledge in Accessing aAQUA e-Agriservice in Maharashtra: A Critical Analysis. *Journal of Global Communication.* Vol. 11, No. 2, pp. 145-151.