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Original Research Article

Profile of Farmers about Utilization of Digital Communication Technologies (DCTs) in Agriculture

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A B S T R A C T

The present study explored profile characteristics of farmers about utilization of Digital and Communication Technologies (DCTs) in agriculture. For the study Parbhani district were randomly selected from Marathwada region of Maharashtra State. Three talukas viz., Parbhani, Gangakhed and Purna from Parbhani district were selected randomly and three villages from each talukas were selected randomly. From each village fifteen respondents were selected randomly. That respondent who are using smart phone with internet facilities is available and engaged in agricultural operations. The constituting total sample size is 135. The Ex-post-facto research design was used for the study. A well structured questionnaire designed for study was used for collecting the data from respondents through personal interview method. The data collections from the respondents were edited tabulated and analyzed using suitable statistical tools like frequency, percentage, mean, standard deviation and Pearsons coefficient of correlation. The study was noticed that, the profile characteristics of farmers concluded from the present study that majorities of respondents were having middle age group (58.52%), education up to secondary school (35.56%). Also clearly observed that majority of farmers belong to marginal land holding (61.48%), medium farming experience (60.74%), medium level of possession of DCT tools (58.52%), farmers belong to medium annual income category (84.44%), no trainings (63.70%), medium extension contact (60.00%) and medium level of innovativeness (61.48%). Further it could observed that majority of respondents belong to medium level of risk orientation (51.11%), medium level of scientific orientation (51.85%), medium level of economic orientation (57.04%) and medium awareness (63.70%).

Keywords

DCT tools, Utilization, Profile characteristics of farmers

Introduction

Information and Communications Technologies are given more emphasis in many countries due to the significant role in socio-economic development of farming community through facilitating agricultural extension and development of farming community through facilitating agricultural extension and development of agriculture. The ICT's now include computer based applications and such communication tools as digital information repositories i.e. online or offline, digital photography and videos, as well as mobile phones (Balaji *et al.*, 2007). In the present era, new avenues in the form of Digital and Communication Technology (DCT) are being used for dissemination of agricultural information. The term Digital and Communication Technologies (DCT) can be defined as electronic and digital technologies for storing, processing,

transferring of information and communication. Digital and Communication Technologies (DCT) are being able to communicate between two or more people at one time, this includes email, SMS, phone calls, social media, MMS, *etc*., (Anonymous, 2016).

The aim of the Digital and Communication Technology (DCT) applications is to deliver the extension services for right information at right time to the right person. It can enable extension functionaries together, store, retrieve and disseminate a broad range of information needed by farming community. India's internet users expected to register double digit growth to reach 627 million in 2019, driven by rapid internet growth in rural areas, by the end of this year. The total user base, 87 per cent or 493 million Indians are defined as regular users, having accessed internet in last 30 days. Nearly 293 million active internet users reside in urban area, while there are 200 million active users in rural area (Anonymous, 2018). The old ICT tools example like radio, television, video, films, slides, pictures, print media, telephone, *etc*., are being used to disseminate the information to the grassroots level users.

The modern Digital and communication Technologies (DCT) tools like agriculture mobile app, mobile SMS service, e-learning, video-conferencing, e-mail, Facebook, Whatsapp, You tube, Twitter, blog, Wikipedia, web portal. Another Kisan Krishideepam, IFFCO Kisan app, e-NAM, *etc*., these tools is wireless communication technology along with powerful software which can process and integrate sound, text, video into electronic media. Apart from these other Digital and Communication Technologies (DCT) tools used, but an above tools are the prominently used by the farmers and general Indian populations.

Materials and Methods

The present study was carried out in Marathwada region of Maharashtra State during the year 2019-20. The present investigation was carried out in Marathwada region for the study one district is selected randomly, i.e. Parbhani. In Parbhani district of three talukas selected randomly i.e. Parbhani, Gangakhed, and Purna. In selected talukas three villages were randomly selected, thus total nine villages were selected for the present investigation. From each selected village, fifteen (15) farmers were selected randomly. That farmer who are using smart phone with internet facilities is available and engaged in agricultural operations was selected as a respondent. Thus, 135 (Total 9 × 15 = 135) total respondents for the present study. An interview schedule was prepared, so as to collect the information in line with the objectives of the study. Personal interview technique was used for data collection. The ex-post-facto research design was used for the present study. The data collected from the selected respondent during the course of investigation was entered and tabulated in the excel worksheet and then appropriate analysis of data was made according to objectives formulated for study. Further, the statically techniques were applied to analyze tabulated data and interpreted it to reach up to the findings. Statistical methods to be used viz. mean, standard deviation, Karl Pearson's correlation coefficient, frequency and percentage.

Results and Discussions

Profile characteristics of farmers

Age

Age was considered as a factor, since it reveals the ability of an individual to take

positive decisions for achieving his needs and it influences the farmers to choose and to adopt a particular new technology. The table 1 revealed that majority 58.52 per cent of the respondents belonged to middle age group, followed by 21.48 per cent were young category and rest 20.00 per cent of the respondents belonged to old age category. This shows that most of the respondents were middle age group. The reason might be that young and middle aged farmers are risk bearer, energetic, enthusiastic, innovator and keen to adopt new technologies as compared to old age farmers. Old age and middle age people living in the villages so that they depend on agriculture. The results were supported by the findings of Giridhar *et al.*, (2019).

Education

The education is the process of the brining about desirable changes in the behaviour. Education is nothing but process of developing knowledge, wisdom and other desirable qualities of mind, character and general competencies, especially by a source of formal instruction. The table 1 revealed that majority 35.56 per cent of the respondents were educated up to secondary school level, followed by 30.37 per cent of the respondents were educated up to primary school level, 15.56 per cent of the respondents were educated up to college level, 14.07 per cent of the respondents were educated up to higher secondary education, 4.44 per cent respondents were illiterates and no respondent is found can read and write only. Generally in the rural areas having the educational facility available up to primary and secondary school level. For getting graduation studies one has to go in city which requires more money. Due to this economical reason the education of the rural people is restricted. This clearly indicated that, the large proportion of the respondent had their education up to secondary school level. The results were supported by the finding of Giridhar *et al.*, (2019).

Land holding

The number of standard acres/hectares of land owned and cultivated by the each respondent family was considered in determination of their size of land holding. The table 1 revealed that majority 61.48 per cent of the respondents belonged to category of marginal land holding, followed by 21.48 per cent of the respondents belonged to small category, 13.33 per cent were belonged to semi-medium category, 3.70 per cent were from medium category and no one can found large category of land holding. The probable reason might be that ancestral transfer of land holding from generation to generation and other reasons that increasing population on land. More the fragmentation of land that is decreases the farm size. Thus, majority of the farmers were marginal land holding. This may be due to farmers are unable to invest and experience latest technology. The results were supported by the finding of Panda *et al.*, (2019).

Farming experience

Experience in farming indicates the level of familiarity of farmers in farming. The experience is important factor that influence the decision making ability, management ability and help the farmer in taking risk. The table 1 revealed that majority 60.74 per cent of the respondents had medium years of farming experience, followed by 23.70 per cent of the respondents had low years of farming experience and rest 15.56 per cent of the respondents had high years of farming experience. The probable reason might be that medium farming experience of majority of the respondents is due to unemployment problem and condition, among them since

they are newly educated rural youths; they are pruned to be gain farming as enterprise. Since they are newly entering in to the farming, they might less experience as compared to traditional profession of old age group of farmers. The results were supported by the finding of Giridhar *et al.,* (2019).

Possession of DCT tools

It refers to DCT tools owned and used by the respondents and their households. The possession of Digital and Communication Technologies (DCT) tools means item like agriculture mobile app, Television, computer, laptop, smart phone, information kiosk machine, Mobile SMS service, e-learning, video-conferencing, e-mail, Facebook, Whatsapp, You tube, Instagram, Twitter, blog, Wikipedia, web portal, *etc.*, owned or used by the respondents for agricultural purpose. The table 1 revealed that majority 58.52 per cent of the respondents belonged to medium possession of DCT tools, followed by 25.93 per cent of the respondents belonged to low possession of DCT tools and rest 15.55 per cent of the respondents belonged to high possession of DCT tools. The probable reason might be that possession of DCTs tools is depends upon the respondent's level of annual income. Majority of the respondents earned medium level of annual income i.e. below Rs. 3 Lakhs, which restricts the possession of DCTs tools. High cost of DCTs tools like computer, laptop, and Smart phone - iphone behind its low possession rate. The farmers earned higher income there possessed more DCTs tools. The results were supported by the finding of Naik (2018).

Annual income

Annual income is refers to the total income in year of all the family members of the respondent from all the sources. Annual income is a major determinant of the economic well-being of an individual. The table 1 revealed that majority of 84.44 per cent respondents belonged to medium level of annual income, followed by 14.07 per cent were high level of annual income and rest 1.48 per cent of the respondents had low level of annual income. This might be due to most of farmers having farming occupation and this is main source of income. Majority of the farmers were possessed marginal land holding whereas the productivity is not high due to one or the other reasons and marketing facilities are also inadequate. The results were supported by the finding of Tomar *et al.,* (2016).

Training undergone

Training is referred to the process, a sequence or experience a series of opportunities to learn in which the farmers is exposed in some more systematic way to certain event. The table 1 revealed that majority of 63.70 per cent of the respondent had not attended training, followed by 22.22 per cent of respondents were attended 1 – 2 training, 11.11 per cent of respondents were attended 3 – 4 training and rest 2.96 per cent of respondents attended more than 4 training. Majority of the respondents had not attended training; this might be due to lack of awareness among the farmers regarding the usefulness of the DCTs training programmes. In the village areas most of the farmers are busy in their farm operations, and that creates lack of interests in spending their time to participate training programme. The results were supported by the finding of Thangjam and Jha (2019).

Extension contact

Extension contact helps respondent to acquire new knowledge, information and technology. To solve the problems on local level good

extension contact is much needs. Extension contact is simply means respondents' visit to the various local level officers. These village level officers help respondents to solve their problems. The table 1 revealed that majority of 60.00 per cent respondents had medium extension contact, followed by similar percentage i.e. 20.00 of the respondents had high and low extension contact. The probable reason might be that majority of farmers belong to medium category of extension contact because they take help of local extension workers or agricultural officers to solve their problems at local levels. Farmers who have significant extension contacts have better chances to be aware of latest new technology used in agriculture. The results were supported by the finding of Tomar *et al.,* (2016).

Innovativeness

Innovativeness is the degree to which the farmer is oriented to adopt the latest farm technology first in the village. The table 1 revealed that majority of 61.48 per cent of the respondents had medium level of innovativeness, followed by 20.74 per cent were high level of innovativeness and rest 17.78 per cent of respondents had low level of innovativeness. Majority of the farmers had medium level of extension contact with local extension workers and agricultural officers for getting the information about new technology. By this reason due to majority of the farmers are quite earlier in adopting the innovations than the other farmers in the social system. Education plays an important role in motivating, creating interest and developing innovativeness. The results were supported by the finding of Naik (2018).

Risk orientation

Risk orientation is referred to the degree to which a respondent is oriented towards risks and uncertainty due to changing conditions and has the courage to face various risks involved in farming and other activities. The table 1 revealed that majority of 51.11 per cent of the respondents had medium level of risk orientation, followed by 25.19 per cent were high level of risk orientation and rest 23.70 per cent of the respondents had low level of risk orientation. The probable reason might be that majority of the farmers possessed marginal i.e. small land holding. The most of farmers belong to this category does not prefer to take higher risk; hence risk orientation of farmers is medium level. The results were supported by the finding of Verma *et al.,* (2016).

Scientific orientation

Scientific orientation is the degree to which a farmer is oriented to use of scientific methods in decision making and farming. It is characterized by a belief in the science and scientific approach to solve problems in farming. The table 1 revealed that majority of 51.85 per cent of the respondents had medium level of scientific orientation, followed by 28.15 per cent were high level of scientific orientation and rest 20.00 per cent of the respondents had low level of scientific orientation. The probable reason for the above result might be due to majority of the farmers; education up to secondary school level, marginal and small land holding and medium level of annual income. The medium scientific orientation has motivated the farmers to adopt only those farming practices, which are of low in cost and in turns less scientific in nature. The results were supported by the finding of Naik (2018).

Economic orientation

Economic orientation is nothing but the extent of orientation of the respondents towards monetary values and economic

returns. The table 1 revealed that majority of 57.04 per cent of the respondents had medium level of economic orientation, followed by 25.19 per cent of the respondents had high level of economic orientation and rest 17.78 per cent of the respondents had low level of economic orientation. The probable reason might be that majority of the farmers had possessed marginal and small land holding with education up to secondary school level, medium level of annual income and are mostly engaged in agriculture for their livelihood. Whereas poor economic condition may be due to low level of economic orientation of farmers and also less exposure to modern agricultural technologies and less extension contact. To have higher economic orientation, the respondents have to be educated and to use the available resources in a better way, which could be effectively carried out through Digital and Communication Technologies (DCTs) tools. The results were supported by the finding of Naik (2018).

Awareness

Awareness is the ability to perceive, to feel, or to be conscious of events, objects or sensory patterns, is one of the important components of access and plays an important role in utilization of Digital and Communication Technology (DCT). The table 1 revealed that majority of 63.70 per cent of the respondents had medium awareness, followed by 18.52 per cent were high awareness and rest 17.78 per cent of the respondents had low awareness. The probable reason for the medium awareness is influencing respondents in respect of interpreting and applying knowledge about agricultural technologies, which gained through various Digital and Communication technologies (DCTs) tools. The higher education with higher level of annual income of farmers; this is more aware about new technology and DCT tools. The results were supported by the finding of Devaraj and Ravichandran (2014).

Table.1 Profile characteristics of the respondents

Sr. No.		Respondents (n=135)	
		Number	Percentage
1	**Age**		
	Young (Below 33 years)	29	21.48
	Middle (34 to 55 years)	79	58.52
	Old (Above 56 years)	27	20.00
2	**Education**		
	Illiterate	6	4.44
	Can read and write only	0	0
	Primary school level	41	30.37
	Secondary school level	48	35.56

	Higher secondary education	19	14.07
	College level	21	15.56
3	**Land holding**		
	Marginal (Below 1.00 ha)	83	61.48
	Small (1.01 to 2.00 ha)	29	21.48
	Semi Medium (2.01 to 4.00 ha)	18	13.33
	Medium (4.01 to 10.00 ha)	5	3.70
	Large (Above 10.00 ha)	0	0
4	**Farming experience**		
	Low (Below 10 years)	32	23.70
	Medium (11 - 32 years)	82	60.74
	High (33 and above)	21	15.56
5	**Possession of DCT tools**		
	Low (Below 8)	35	25.93
	Medium (9 to 12)	79	58.52
	High (Above 13)	21	15.55
6	**Annual income**		
	Low (Below Rs. 12,275)	2	1.48
	Medium (Rs. 12,276 to 2,94,169)	114	84.44
	High (Above Rs. 2,94,170)	19	14.07
7	**Training undergone**		
	No trainings	86	63.70
	1 – 2 trainings	30	22.22
	3 – 4 trainings	15	11.11
	More than 4 training	4	2.96
8	**Extension contact**		
	Low (Below 23)	27	20.00
	Medium (24 - 39)	81	60.00
	High (Above 40)	27	20.00
9	**Innovativeness**		

	Low (Below 8)	24	17.78
	Medium (9 - 11)	83	61.48
	High (Above 24)	28	20.74
10	**Risk orientation**		
	Low (Below 19)	32	23.70
	Medium (20 - 23)	69	51.11
	High (Above 24)	34	25.19
11	**Scientific orientation**		
	Low (Below 21)	27	20
	Medium (22 - 25)	70	51.85
	High (Above 26)	38	28.15
12	**Economic orientation**		
	Low (Below 20)	24	17.78
	Medium (21 – 24)	77	57.04
	High (Above 25)	34	25.19
13	**Awareness**		
	Low (Below 11)	24	17.78
	Medium (12 – 18)	86	63.70
	High (Above 19)	25	18.52

In conclusion, the study provides us profile characteristics of farmers. They were from majority of farmer middle age category, majority of farmer were educated up to secondary school level, majority farmers possessed marginal land holding, majority of farmer were medium farming experience, majority of farmer were medium level of possession of DCT tools, majority of farmer were medium level of annual income, majority of farmer were not attended any training, majority of farmer were medium extension contact, majority of farmer were medium level of innovativeness, majority of farmer were medium level of risk orientation, majority of farmer were medium level of scientific orientation, majority of farmer were medium level of economic orientation, majority of farmer were medium awareness about Digital and Communication Technology (DCT).

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