



Research Article

ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGY MEDIA BY FARMERS: SOCIO-ECONOMIC PERSPECTIVE

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Abstract: Information and Communication Technology (ICT) forms a real source of information and knowledge for people, particularly farmers, since it cater solution for their different problems through the access to agriculture information. In the present study, the role of media has been examined in rural development with focus on farming activities among paddy cultivators in Kerala. Thus, the access of farmers to various media based on their socio-economic conditions and the effects of various impact accelerating factors on the information dissemination of various media were also assessed. Study was conducted in the Thiruvananthapuram district of Kerala state: Chirayinkeezhu, Parassala, and Vamanapuram, representing low land (or coastal plain), mid land and high land regions respectively. Among the various media, farmers have high access to print (46.50 %), mass media (45.00 %), extension services (56.00 %) and mobile (34.00 %). Significant difference was observed in the access to media by farmers across various socio-economic groups and also in the type of media through which information is provided. Within the impact accelerating factors, the digital literacy and possession status are found to be prominent factors. Results on the access to information and type of media implicates that farmers are more prominent towards accessing less skill required media as compared to high skill required media. Thus, only by improving the skill status of farmers, it is possible to improve the access status of media by farmers.

Keywords: ICT, IAF Paddy, Agriculture, Farmers

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Introduction

Information and communication technology (ICT) plays a tremendous opportunity to encourage farming activities which transforms the rural economy. ICT comprises of a range of elements viz., computer hardware and software, television, radio, mobile phones, personal computers, kiosks and the policies that govern these media and devices [1]. It provides new approaches and areas for communicating and sharing the information. ICT forms a real source of information and knowledge for people particularly farmers, since it cater solution for their different problems through the access to agriculture information [2]. ICTs can also improve farmers' access to production inputs, market information, consumer trends, which absolutely has great impact on the quality and quantity of the agriculture production [3]. Studies conducted by [4] on the impact of mobile phones in Indian Agriculture revealed the impact of mobile phones on the crop sector and particularly on small farmers. [5] focused on the extent of the use of mobile phones by farmers where he found out that more than half (54 percent) of the farmers had medium use of mobile phones in receiving agricultural information while 14 and 32 per cent of them had low and high use of mobile phones, respectively.

There are many problems like feasibility and connectivity in rural areas, awareness and use of the technology, literacy and need for basic computer literacy which hinders the fast development of information and communication technology. The reach of the advanced information communication technology is not symmetric and large chunk of farmers are still ignorant about such advanced technologies which leads to an asymmetric distribution of technologies throughout the country. Thus, asymmetric information regarding the use of technology leads to further prospering of rich farmers who own information technology infrastructure services provided by various agencies and institutions.

The farmers with low literacy rate and minimum knowledge are forced to depend on others to use the technological information which results in information distortion; this will in turn affect the livelihood asset of the farmers. Therefore, the research should focus on the information asymmetry of knowledge in the socio-economic conditions, awareness and practice of the farming communities and the use of communication infrastructure in rural development.

In the present study, media which play a major role in sharing and exchanging the information to farmer viz., print media, mass media, extension, mobile, internet, and agri.-portal have been examined in rural development with focus on farming activities among paddy cultivators in Kerala. Thus, the present study was conducted to analyse the access of farmers to various media based on their socio-economic conditions and to examine the effects of various impact accelerating factors on the information dissemination of various media.

Materials and Methods

Selection of study area and sampling

Study was conducted in the Thiruvananthapuram district of Kerala state, sampling was done from three geographical regions - highlands, midlands and lowlands. One block each was randomly selected from each geographical; Chirayinkeezhu, Parassala, and Vamanapuram, representing low land (or coastal plain), mid land and high land regions respectively. The total numbers of cultivators [6] are 5966, 2559, and 2229 respectively for Vamanapuram, Parassala and Chirayinkeezhu Blocks.

The sample size from the selected blocks is decided based on precision rule and confidence interval. The formula used for selecting sample size is as follows:

Table-1 Percentage Distribution of Respondents for the Access to ICT Media

Scale	LSR Media			HSR Media		
	Print Media	Mass Media	Extension	Mobile	Internet	Agri Portal
Very low	2.00	1.50	3.50	2.50	5.00	9.50
Low access	5.50	6.00	6.50	15.50	28.00	23.50
Neutral	6.50	7.00	8.50	14.00	18.00	26.50
High access	46.50	45.00	56.00	34.00	26.50	23.00
Very high access	39.50	40.50	25.50	34.00	22.50	17.50
Total	100.00	100.00	100.00	100.00	100.00	100.00

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2(N-1) + z^2 \cdot p \cdot q}$$

Here, 'p' represents the proportion of variability, $q = (1-p)$. The value of 'z' represents the standardized normal value for the given level of confidence interval, 'e' is the percentage of expected error and N is equal to the total number of populations. Here, the value of 'p' is assumed as ten percent, Z is 1.96 which is equal to the standardized value for 95 percent confidence interval and 'e' or percentage error which is assumed to be 4 percent. Thus, the arrived sample size is 179 and while considering the non-response on the part of the respondents, a total sample size of 200 is decided.

Level of Access to ICT media

The access status to ICTM by respondents is represented by an access score. The options for access are: very low, low access, neutral, high access and very high access and these options are assigned values of zero, one, two, three and four respectively. By aggregating the values assigned to various options for access, an access score is prepared for each media and combining these individual media access score, an aggregate access score is also derived.

Access to ICT Media and Socio-economic Status

The distribution of access score of various media across various age, education and land holding size groups were analysed in this aspect.

Access to ICT Media and Impact Accelerating Factors

The access to ICT media is greatly influenced by the status position of farmers with respect to various impact accelerating factors (IAF) such as awareness, digital literacy, use and possession status of media devices. A combined score is calculated for all digital media used by farmers, which represents the digital literacy score. Digital literacy score is the sum of the Likert scale values assigned to various options for the seven digital media viz., smart phone, computer, internet, web portal, e-mail, social media and online government service.

All information media which provides service to farmers are categorized into print media, mass media, mobile, information technology and extension services. The print media includes pamphlet/leaflet, newspaper and magazines; mass media includes radio, television, and video; information technology includes internet, web sites, agri portal and information kiosks; and extension services includes the extension services provided by Kerala Agriculture University, Krishi Vigyan Kendra, Farm Information Bureau and Krishi Bhavan. Each respondent gets a score of awareness for different ICT media. The awareness scores of all ICT media devices are aggregated together to arrive at an aggregate awareness score. The term possession implies the ICT media devices possessed by the farmers which help in the process of information dissemination. The possession of various information devices by farmers such as mobile phone, smart phone, computer, laptop, internet, radio and TV. Sum total of values received for all ICT media devices are aggregated together for each farmer.

Access to Information and Type of Media

For the present study, information communication media which provide information about agricultural practices to farmers are divided into print media, mass media, extension services, mobile, internet and Agri. Portal. These ICT media are combined into less skill required (LSR) media and high skill required (HSR) media. The LSR media includes the print, mass media and extension services while HSR media consists of mobile, internet and agri. portals. The access of farmers to the LSR and HSR media is assessed.

Statistics

The important statistical techniques used in addition to the descriptive statistics are ANOVA, F-statistics, t-test and Chi-square statistics.

Results

Level of Access to ICT media

The percentage of respondents who access the various ICT media are summarized in [Table-1]. Among the various media, farmers have high access to print (46.50 %), mass media (45.00), extension services (56.00) and mobile (34.00). However, their access to internet and agri portal services is very low.

Access to Various ICT Media and Socio-economic Status

[Table-2] shows the distribution of access score of various media across various age, education and land holding size groups. As shown in the table, the access level is greater for print, mass media and extension services. The access to internet and agri portal services is very less.

Access to ICT Media and Impact Accelerating Factors

[Table-3] summarizes the variation of impact accelerating factors in accessing media. It shows that the access score is greater among the groups having higher status in awareness, digital literacy, use and possession status. Also, the difference in access score between lower and higher groups of above-mentioned impact accelerating factors are statistically very significant.

Access to Information and Type of Media

[Table-4] reveals that the access score of farmers is greater with respect to LSR media as compared to HSR media. The mean access score from LSR media and HSR media are statistically different and independent.

Discussion

The level of access to ICT media reveals its real impact on the life of farming community and for overall agricultural development. Thus, the access to information media is a prerequisite for channelizing the positive impacts of ICT media on rural development. Studies are in concurrence with that of [7, 8] where they indicated the use of mobile phones for coordinating access to market information, agricultural inputs, monitoring financial transactions, and consulting with agricultural experts. It was revealed from the research findings that mobile phones, radio and television are the most important tools of communication which can be accessed by farmers for agricultural related information and knowledge [9, 11].

In the case of access to ICT media and socioeconomic conditions, significant difference was observed in access score across various age groups, education and landholding size. It was found that a negative relationship exists between age and access to media. This decrease in access status as age increases was very much visible in the case of internet and agri portal services. While education has a positive relationship with access status where the access score of highly educated respondents is greater than lower educated group. Similarly, the landholding size also exhibited a positive relationship; as the landholding size increases, the access of respondents to various media also increases. Though access status of media is different across various socio-economic groups, such differences could not be found in the regional context. However, the difference in access score between selected Blocks is not very significant. It again implies that asymmetry in access of information is more prominent across various age, education and landholding classes as compared to regional level.

Table-2 Distribution of Access of ICT Media by Socio-economic Condition

	Classification of age	ICT media						Aggregate access score
		Print media	Mass media	Extension	Mobile	Internet	Agri. portal	
Age	up to 45 years	4.69	4.76	4.52	4.48	4.21	3.93	26.59
	46-55 years	4.68	4.56	4.27	4.44	3.76	3.56	25.27
	56-65 years	3.92	4.08	3.89	3.59	3.12	2.97	21.58
	above 65 years	3.31	3.17	2.94	2.63	2.31	2.17	16.54
	Average	4.16	4.17	3.94	3.82	3.34	3.16	22.57
	Test statistics	F=31.313 df =3and 196 Sig =0.000	F=33.065 df =3and 196 Sig =0.000	F=25.790 df =3and 196 Sig =0.000	F=34.767 df =3and 196 Sig =0.000	F=20.412 df =3and 196 Sig =0.000	F=17.468 df =3and 196 Sig =0.000	F=47.85 df =3and 196 Sig =0.000
Education	Read and Write	3.13	2.87	3.20	2.67	2.33	2.33	16.53
	Primary Level	3.27	3.19	2.96	2.50	2.27	2.19	16.38
	Upper Primary	3.91	4.00	3.69	3.22	2.87	2.87	20.57
	High School	4.17	4.21	4.03	3.97	3.24	3.13	22.75
	Higher Secondary	4.64	4.60	4.08	4.12	3.16	2.64	23.24
	Degree/Diploma	4.78	4.87	4.50	4.75	4.56	4.19	27.66
	Professional Degree / PG	4.88	5.00	4.81	4.94	4.87	4.75	29.25
	Average	4.1600	4.17	3.94	3.82	3.34	3.16	22.57
	Test statistics	F=20.085 df =6 and 193 Sig =0.000	F=32.577 df =6 and 193 Sig =0.000	F=14.917 df =6 and 193 Sig =0.000	F=30.147 df =6 and 193 Sig =0.000	F=26.019 df =6 and 193 Sig =0.000	F=20.271 df =6 and 193 Sig =0.000	F=47.30 df =6 and 193 Sig =0.000
Landholdings (Cents)	Below 100	3.64	3.58	3.58	3.02	2.58	2.56	19.00
	100 and 160	4.28	4.28	4.04	4.06	3.46	3.38	23.50
	160 and 240	4.24	4.39	3.90	3.88	3.34	2.93	22.68
	Above 240	4.35	4.35	4.13	4.13	3.83	3.56	24.35
	Average	4.1600	4.1700	3.9350	3.8150	3.3350	3.1550	22.5700
	Test statistics	F=5.615 df =3and 196 Sig =0.001	F=8.715 df =3and 196 Sig =0.000	F=2.986 df =3and 196 Sig =0.032	F=10.510 df =3and 196 Sig =0.000	F=9.061 df =3and 196 Sig =0.000	F=6.869 df =3and 196 Sig =0.000	F=10.804 df =3and 196 Sig =0.000
Block	Parassala	4.20	4.37	3.92	4.1429	3.31	3.04	22.98
	Vamanapuram	4.06	4.03	3.88	3.6972	3.34	3.16	22.17
	Chirayinkeezhu	4.36	4.27	4.09	3.7381	3.36	3.29	23.12
	Average	4.1600	4.17	3.94	3.8150	3.34	3.16	22.57
	Test statistics	F=1.637 df =2 and 197 Sig =0.0197	F=2.717 df =2 and 197 Sig =0.069	F=0.770 df =2 and 197 Sig =0.464	F=2.756 df =2 and 197 Sig =0.066	F=0.020 df =2 and 197 Sig =0.980	F=0.441 df =2 and 197 Sig =0.664	F=0.703 df =2 and 197 Sig =0.496

Table-3 Distributions of Access Score of ICT Media by IAF

IAF	Classification of IAF	ICT media						Aggregate access score
		PrintMedia	Mass media	Extension	Mobile	Internet	Agri. portal	
Awareness score	Below average	3.51	3.44	3.37	2.93	2.49	2.39	18.13
	Above average	4.55	4.6	4.27	4.34	3.84	3.62	25.23
	Difference	1.04	1.16	0.9	1.41	1.35	1.23	7.1
	Test statistics	F=87.688 df =1 Sig =0.000	F=126.27 df =1 Sig =0.000	F=51.945 df =1 Sig =0.000	F=112.02 df =1 Sig =0.000	F=75.973 df =1 Sig =0.000	F=60.108 df =1 Sig =0.000	F=156.16 df =1 Sig =0.000
Use score	Below average	3.81	3.76	3.56	3.27	2.71	2.63	19.74
	Above average	4.62	4.70	4.43	4.53	4.13	3.84	26.24
	Difference	0.81	0.94	0.87	1.26	1.42	1.21	6.5
	Test statistics	F=48.217 df =1and 198 Sig =0.000	F=71.216 df =1and 198 Sig =0.000	F=50.495 df =1and 198 Sig =0.000	F=86.423 df =1and 198 Sig =0.000	F=90.893 df =1and 198 Sig =0.000	F=61.462 df =1and 198 Sig =0.000	F=125.234 df =1and 198 Sig =0.000
Digital literacy score	Below average	3.83	3.83	3.62	3.34	2.76	2.66	20.04
	Above average	4.75	4.78	4.50	4.65	4.36	4.03	27.07
	Difference	0.92	0.95	0.88	1.31	1.6	1.37	7.03
	Test statistics	F=60.711 df =1and 198 Sig =0.000	F=67.08 df =1and 198 Sig =0.000	F=48.62 df =1and 198 Sig =0.000	F=87.24 df =1and 198 Sig =0.000	F=124.6 df =1and 198 Sig =0.000	F=77.65 df =1and 198 Sig =0.000	F=146.44 df =1and 198 Sig =0.000
Possession score	Below average	3.86	3.83	3.62	3.34	2.68	2.62	19.95
	Above average	4.65	4.73	4.45	4.61	4.43	4.05	26.93
	Difference	0.79	0.9	0.83	1.27	1.75	1.43	6.98
	Test statistics	F=42.002 df =1and 198 Sig =0.000	F=59.776 df =1and 198 Sig =0.000	F=42.581 df =1and 198 Sig =0.000	F=83.353 df =1and 198 Sig =0.000	F=173.13 df =1and 198 Sig =0.000	F=92.47 df =1and 198 Sig =0.000	F=147.23 df =1and 198 Sig =0.000

The Information and communication technology media are more or less symmetrically distributed across various regions of Kerala. But its access is determined by the status in education, land holding size etc.

With regard to the Impact Accelerating Factors (IAF), the aggregate access score of higher groups with respect to digital literacy is greater than other factors, the variation in digital literacy creates a greater impact on access to media. Next to digital literacy, the impact of possession of media devices has a greater impact.

Thus, within the impact accelerating factors, the digital literacy and possession status are prominent factors relatively.

Results on the access to information and type of media implicates that farmers are more prominent towards accessing less skill required media as compared to high skill required media at present. Only by improving the skill status of farmers, it is possible to improve the access status of media by farmers.

Table-4 Aggregate Access Score of Farm Information LSR and HSR Media

Category	Type of media	Mean score	Dependent- t test
Aggregate access score of farm information	LSR media	12.26	t-value= 11.63 Df= 199
	HSR media	10.3	Sig =0 .000

Conclusion

The foregoing analysis explored the impact of various Information communication technology media on the life and living conditions of farmers in the study area. The intrusion of information communication technology into the life of farming is greatly influenced by their status on impact accelerating factors such as awareness, digital literacy, use and possession of media devices. Though a large proportion of farmers use this information provided by various media, the issue on asymmetry in the use of these information media is still an unaddressed issue. Farming community is yet to tap the potential of high skill required media in their agriculture practices. The interaction of farming community with those organized institutions which are entitled to provide farming related information is yet to take off.

Application of research: The extent of use of these information communication technology media for the overall development of rural areas cannot be ensured unless the access of information media is guaranteed. However, there exists a significant difference in the access of farmers across various socio-economic groups and type of media through which information is provided. The farmers' access to high skill required media in its fullest potential is still a dream.

Research Category: Extent of access to ICT media by farmers in agriculture

Abbreviations: ICT-Information and Communication Technology

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Author agree to submit ethical clearance certificate from the concerned ethical committee or institutional biosafety committee, if the project involves field trails/experiments/exchange of specimens, human & animal materials etc.

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