

# Extent of Use of Information and Communication Technology to Farmers Livelihood Assets: A Special Reference to Social Capital

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**Abstract** - Information and Communication Technology (ICT) is a fast-moving technology which influences the social capital leading to betterment of the farmer's livelihood assets. In the present investigation, the print and mobile media played a key role in information dissemination thus promoting various dimensions to the livelihood of farming community. This leads to widening of the asymmetry in the perception on usefulness of information among respondents. Farmers also found that the extent of usefulness of information from Low Skill Required (LSR) media is significantly higher than that of High Skill Required (HSR) media. The utilization of the information from ICT media for promotion of all types of livelihood assets for farmers is influenced by their socio-economic conditions and Impact Accelerating Factors (IAF). It was found that relatively young, highly educated and economically superior farmers are able to utilize this information very effectively. However, no significant difference was observed in the region wise distribution of information provided by various media for the promotion of livelihood assets, except that of mass media and Agri.portal. The farmers with higher IAF status were able to utilize the information more effectively for the promotion of livelihood assets.

**Keywords:** farmer, Information and Communication Technology (ICT), livelihood assets, paddy, social capital

## I. INTRODUCTION

Knowledge is the critical factor which differentiates the status of an individual in a community from others. The content, the application and speed of the use of the acquired knowledge greatly depends on the technology and media through which the relevant information are provided. The application of modern information and communication technology (ICT) in information dissemination process revolutionized the speed, efficiency, content and application of knowledge generation mechanism which transforms the livelihood asset of the farmers.

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 (Warren, 2002). It provides new approaches and areas for communicating and sharing the information (Herselman, 2003), thus reducing the distance among different communities. ICT also plays an effective role in the agriculture development especially in the decision-making aspect of the livelihood assets of farming communities in rural areas (Taragola and Van Lierde, 2010). Significant changes in the rural community through Information and Communication Technology (Poonam, 2012) resulted in an increased production, information and knowledge (Arunachalam, 1999; Yadav, 2015). Information sharing on new production processes with farmers was prominent in the sixties which was the key to the success of the Green revolution (Farmer, 1986). Rural economies can be benefitted from ICT by focusing on production, consumption and social services in rural areas (Malhotra, 2001). However, Sen (1999) argued persuasively that the development is not just about macroeconomic growth, but an increase in the overall number and quality of choices available to the individuals in pursuing their lives and livelihoods.

The dissemination of ICTs extensively to the rural communities can facilitate the adoption of traditional and modern scientific knowledge, best practices for adoption of agricultural inputs, farm practices, decision making on markets, etc., which transforms the rural economy. 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.

The present investigation was conducted to analyze the extent of use of various ICT media for the promotion of social capital in the livelihood assets status of farmers based on socio-economic conditions and to examine the effects of



Impact Accelerating Factors (IAF) on dissemination of information by various media.

## II. DATA SOURCES AND METHODOLOGY

The district Thiruvananthapuram, capital city of Kerala has been selected for the study. For sample purpose, one block from each geographical region were selected randomly. The randomly selected Blocks are Chirayinkeezhu, Parassala and Vamanapuram, representing low land (or coastal plain), mid land and high land regions respectively. It is found that of the total cultivators, approximately ten percent of cultivators are engaged in paddy cultivation and hence the total number of paddy cultivators for all selected Blocks is 1075. The sample size from selected Blocks is decided based on precision rule and confidence interval. The formula used for selecting sample size is as follows:

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

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.

The primary data was collected from the selected field with structured interview schedule. The rationale for selecting paddy farmers for studying the extent of the use of various ICT media and their impact is as follows: There has been a continuous decline of cultivation areas under paddy in the State. There are various farm management practices in crop cultivation where intensive care is required to produce maximum output. These are the areas where information communication had a vital role which is catered by technology kiosks and portals for the cultivation of paddy. Thus, among the various crops, the scope and extent of use of information technology is high for the paddy cultivation.

## III. CONCEPTS AND TOOLS FOR THE ANALYSIS

For the present study, ICT media which provide information about agricultural practices to farmers are divided into print

media, mass media, extension services, mobile, internet and Agri. portal. 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. 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 impact of ICT on the promotion of social capital in the livelihood assets of farmers is evaluated in the study. The extent to which the farmers are benefitted with the media information about the social capital viz., network of farmers, farm group, social media, community involvement and political participation were assessed based on the socio-economic conditions such as age, education, landholdings and region (block). The extent of use of ICT for the promotion of this social capital is assessed with the help of respective usefulness score. The important impact accelerating factors (IAF) identified are the awareness, digital literacy, use and possession of various media devices and the corresponding scores which represent the status of each impact accelerating factors are estimated.

## IV. RESULTS AND DISCUSSION

### A. ICT Media for Social Capital Promotion

Of the different media, maximum percentage of farmers got information about network of farmers, farm group, social media and community involvement from mobile while in the political participation, print media was useful. The Agri.portal is least useful media for augmenting social capital among farmers in the study area. Farmers access to assets or livelihood capitals enable them to escape poverty (FAO, 2015). The social capital is strongly linked to the availability and accessibility to the rice production technologies and rate of adoption by the farmers. Social networks may indirectly affect agricultural productivity by influencing farm practices and the household's predisposition to adopt newer technologies through information from these networks (Liverpool and Winter, 2010).

**Table 1. Percentage Distribution of Social Capital of the Respondents by various ICT media**

ICT media	Scale	Social Capital				
		Network of farmers	Farm group	Social media	Community involvement	Political participation
Print media	Not at all useful	24.00	23.50	23.50	22.00	30.00
	Not useful	27.50	23.50	29.00	22.00	21.00
	Neutral	17.50	20.50	23.00	14.00	16.50
	Useful	30.00	31.50	23.00	40.00	30.00
	Very Useful	1.00	1.00	1.50	1.50	2.50
	Total	100.00	100.00	100.00	100.00	100.00
Mass media	Not at all useful	24.50	24.00	21.00	22.00	24.50
	Not useful	31.0	28.50	32.50	32.00	28.50
	Neutral	15.00	20.00	22.00	15.00	15.50
	Useful	27.50	26.00	22.50	29.50	29.50
	Very Useful	2.00	1.50	2.00	1.50	2.00
	Total	100.00	100.00	100.00	100.00	100.00
Extension	Not at all useful	20.50	17.50	18.50	19.50	32.50
	Not useful	33.00	29.00	36.50	37.50	37.00
	Neutral	10.500	11.00	16.00	14.50	16.50
	Useful	31.50	36.50	27.00	26.00	13.00
	Very useful	4.50	6.00	2.00	2.50	1.00
	Total	100.00	100.00	100.00	100.00	100.00
Mobile	Not at all useful	19.00	19.50	20.00	19.50	27.50
	Not useful	24.00	22.00	22.00	22.00	28.00
	Neutral	10.00	11.50	11.50	11.50	15.00
	Useful	40.50	40.50	39.50	41.50	28.00
	Very Useful	6.50	6.50	7.00	5.50	1.50
	Total	100.00	100.00	100.00	100.00	100.00
Internet	Not at all useful	23.50	23.50	23.00	23.00	32.50
	Not useful	30.00	32.00	30.50	34.50	32.50
	Neutral	12.00	13.00	16.50	18.50	18.50
	Useful	29.00	26.50	25.50	21.00	15.00
	Very Useful	5.50	5.00	4.50	3.00	1.50
Agri.portal	Total	100.00	100.00	100.00	100.00	100.00
	Not at all useful	26.50	24.00	26.50	26.50	26.00
	Not useful	41.00	42.50	40.00	41.00	42.50
	Neutral	20.50	22.00	22.50	22.50	21.50
	Useful	10.00	9.50	9.00	8.50	9.00
	Very Useful	2.00	2.00	2.00	1.50	1.00
	Total	100.00	100.00	100.00	100.00	100.00

Source: Primary Survey

**B. Usefulness of Information for Social Capital from ICT Media and Socio-economic Conditions**

The socio-economic factors such as age, education and landholding size and their relationship with the perception on usefulness of information on social capital promotion is given in Table 2. The perception on extent of usefulness of mobile media (14.12) is highest as compared to other media followed by print media (12.99) and extension services (12.76).

The socio-economic factors greatly influence the perception on usefulness information provided by various media. It is observed that a negative relationship exists between the age and usefulness score. The usefulness score of higher age groups is significantly lower than higher age group. This trend is applicable for all media. Within the media, the younger farmers were much benefitted with the information from the internet and mobile media.

Education and usefulness score are positively related. The perception of usefulness of information for social capital is significantly higher among higher education

groups as compared to lower educated groups. Compared to other media, the higher educated peoples' perception on useful of information is high from mobile and print media. With land holding size also, the perception on useful score has a positive relationship. In general, as the landholding size increases, the respondents find that media are more useful in providing information for promoting social capital. Also, the difference in perception on usefulness among various landholding size groups is statistically very significant.

In the case of blocks, except in the case of print media, the perception of usefulness of information is high among respondents from Parassala Block while the respondents from Vamanapuram Block received highest

usefulness from print media. The difference in perception between selected Blocks is statistically significant only with respect to mass media and Agri. portal.

**Table 2. Distribution of Useful Score of ICT Media for Social Capital and Socio-economic Condition**

category	Distribution of category	Print media	Mass media	Extension	Mobile	Internet	Agri. portal	aggregate usefulness score
Age	Below 45 years	16.38	15.97	14.13	18.28	17.00	13.83	95.59
	46-55 years	14.00	13.35	14.43	16.68	14.47	12.23	85.16
	56-65 years	13.26	12.74	12.77	12.72	11.06	10.09	72.71
	above 65 years	7.8571	8.4286	8.6286	9.11	8.05	8.14	50.22
	Total	12.9950	12.6650	12.7600	14.12	12.45	10.95	75.95
	Test statistics	F=20.042 df=3and 196 Sig = 0.000	F=14.294 df=3and 196 Sig = 0.000	F=13.107 df=3and 196 Sig = 0.000	F=27.093 df=3and 196 Sig = 0.000	F=25.076 df=3and 196 Sig = 0.000	F=13.166 df=3and 196 Sig = 0.000	F=24.718 df=3and 196 Sig =0.000
Education	Read and write	8.53	9.00	8.73	9.46	9.13	8.33	53.20
	Primary level	9.26	9.85	9.88	10.03	9.42	8.85	57.31
	Upper primary	10.08	9.78	9.52	9.43	8.61	9.35	56.78
	High school	12.41	12.71	12.73	14.44	11.67	10.46	74.43
	Higher Secondary	14.92	13.44	14.96	15.24	12.40	10.80	81.76
	degree/diploma	16.90	15.88	15.78	19.06	18.03	14.25	99.90
	Professional degree/PG	18.87	17.00	16.50	19.00	18.06	14.75	104.18
Average	12.99	12.67	12.76	14.12	12.45	10.9550	75.95	
	Test statistics	F=17.826 df=6 and 193 Sig = 0.000	F=9.565 df=6 and 193 Sig = 0.000	F=11.907 df=6 and 193 Sig = 0.000	F=19.289 df=6 and 193 Sig = 0.000	F=19.641 df=6 and 193 Sig = 0.000	F=8.966 df=6 and 193 Sig = 0.000	F=20.565 df=6 and 193 Sig =0.000
Landholdin gs	Below 100	9.6279	9.3256	9.69	10.51	8.9535	8.23	56.35
	100 and 160	13.79	13.66	13.28	15.35	13.76	12.13	81.98
	160 and 240	13.29	13.00	13.71	14.71	13.32	11.29	79.32
	Above 240	14.63	13.96	13.96	15.13	13.00	11.44	82.11
	Average	12.99	12.67	12.76	14.13	12.45	10.95	75.96

	Test statistics	F=8.692 df=3 and 196 Sig = 0.000	F=8.604 df=3 and 196 Sig = 0.000	F=7.796 df=3 and 196 Sig = 0.000	F=8.112 df=3 and 196 Sig = 0.000	F=8.439 df=3 and 196 Sig = 0.000	F=7.844 df=3 and 196 Sig = 0.000	F=11.052 df=3 and 196 Sig =0.000
Block	Parassala	12.41	12.90	14.12	15.41	13.88	12.40	81.12
	Vamanapuram	13.17	12.81	12.19	13.49	11.79	10.21	73.66
	Chirayinkeezhu	13.21	12.02	12.64	14.26	12.52	11.19	75.85
	Average	12.99	12.66	12.76	14.13	12.45	10.95	75.95
	Test statistics	F=0.393 df=3 and 196 Sig = 0.676	F=0.403 df=3 and 196 Sig = 0.000	F=2.588 df=3 and 196 Sig = 0.078	F=1.905 df=3 and 196 Sig = 0.152	F=2.478 df=3 and 196 Sig = 0.087	F=4.268 df=3 and 196 Sig = 0.015	F=1.274 df=3 and 196 Sig =0.282

Source: Primary Survey

**C. Usefulness of information on Social Capital and IAF**

The variation in perception on usefulness score between lower and higher IAF such as awareness, digital literacy,

use and possession status of media devices are given in Table 3.

**Table 3. Distribution of Usefulness Score of ICT Media by IAF**

IAF	Classification of IAF	Print media	Mass media	Extension	Mobile	Internet	Agri. Portal	Aggregate usefulness score
Awareness Score	Below average	9.24	9.14	9.80	9.86	8.68	8.31	55.04
	Above average	15.25	14.78	14.53	16.68	14.72	12.54	88.50
	Difference	6.01	5.64	4.73	6.82	6.04	4.23	33.46
	Test statistics	F=84.879 df=1and 198 Sig = 0.000	F=74.552 df=1and 198 Sig = 0.000	F=53.446 df=1and 198 Sig = 0.000	F=98.012 df=1and 198 Sig = 0.000	F=78.569 df=1and 198 Sig = 0.000	F=52.753 df=1and 198 Sig = 0.000	F=109.879 df=1and 198 Sig = 0.000
Use Score	Below average	10.46	10.06	10.68	11.14	9.47	8.823	60.64
	Above average	16.28	16.04	15.45	18.00	16.32	13.72	95.83
	Difference	5.82	5.98	4.77	6.86	6.85	4.897	35.19
	Test statistics	F=83.248 df=1and 198 Sig = 0.000	F=94.953 df=1and 198 Sig = 0.000	F=58.111 df=1and 198 Sig = 0.000	F=107.472 df=1and 198 Sig = 0.000	F=122.641 df=1and 198 Sig = 0.000	F=82.909 df=1and 198 Sig = 0.000	F=139.84 df=1and 198 Sig =0.000
Digital literacy score	Below average	11.04	10.83	11.16	11.60	9.75	9.28	63.68
	Above average	16.4583	15.9167	15.5972	18.5972	17.2639	13.9306	97.7639
	Difference	5.42	5.09	4.44	7.00	7.51	4.65	34.08
	Test statistics	F=62.286 df=1and 198 Sig = 0.000	F=55.534 df=1and 198 Sig = 0.000	F=44.374 df=1and 198 Sig = 0.000	F=103.08 df=1and 198 Sig = 0.000	F=150.70 df=1and 198 Sig = 0.000	F=65.641 df=1and 198 Sig = 0.000	F=113.22 df=1and 198 Sig = 0.000
Possession Score	Below average	10.85	11.00	11.20	11.66	9.91	9.45	64.10
	Above average	16.56	15.42	15.34	18.22	16.69	13.44	95.70
	Difference	5.71	4.42	4.14	6.56	6.78	3.99	31.6
	Test statistics	F=73.40 df=1and 198 Sig = 0.000	F=40.13 df=1and 198 Sig = 0.000	F=38.36 df=1and 198 Sig = 0.000	F=87.794 df=1and 198 Sig = 0.000	F=110.45 df=1and 198 Sig = 0.000	F=45.60 df=1and 198 Sig = 0.000	F=92.447 df=1and 198 Sig = 0.000

Source: Primary Survey

It shows that the usefulness score is higher among higher groups of the above-mentioned impact accelerating factors. It implies that as the level of these factors increases, the peoples' perception on usefulness of media in promoting social capital also increases. The differences between lower

and higher groups of all impact accelerating factors with respect to usefulness score for all media are statistically significant. Among the various media, the difference in perception of usefulness between lower and higher groups of IAF is lowest for extension and Agri.portal.

## V. CONCLUSIONS

The livelihood assets, social capital, plays an important role in determining the socio-economic status of farmers. The foregoing analysis highlights that the information and communication technology media plays a critical role in sustaining and promoting all the dimensions of the livelihood assets of farming community in the study area. Among the

various media, the print and mobile media dominates for providing the critical inputs for fostering these types of assets to farmers. Also, the impact accelerating factors positively affect the perception on usefulness of information for livelihood assets, provided by various media.

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