Information Seeking Behaviour of Farmers through Mobile: An Innovative ICT Tool

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ABSTRACT: In the present era of information centricity, mobile phones (ICT tools) might be pretty helpful for farmers to fetch real-time need-based information. An ex-post-facto study, conducted in the purposively selected Sitapur district of Uttar Pradesh, explores the relationship between farmers' socio-personal characteristics and ISB through mobile. Two blocks from the district, three villages from each block and 15 respondents from each village (total of 90 respondents) were selected randomly. Data were collected by personally interviewing the respondents with the help of a semi-structured interview schedule. Multivariate linear regression analysis method was used. Most of the respondents found medium level of ISB through mobile. Regression analysis found significant for variables like education, social participation and annual family income at 1%, mass media exposure and extension contact at 5% and sources of credit at 10%. Standardised beta value explores the size of effect over dependent variable.

Keywords: Innovation, Information seeking behaviour, ICT, mass media exposure, mobile phone.

INTRODUCTION

Information is the collection, storage, processing, and dissemination of data, required to understand and react accurately to personal, environmental, national, and international conditions and be in a position to make appropriate decisions. Professor Kolawole Adebayo quoted information as the fifth factor of production during a three-day Capacity Building Workshop on Agricultural Information System Development organised by "World Bank Africa Centre of Excellence in Agricultural Development and Sustainable Environment" (CEADESE). Currently, "Information is considered a factor of production like others (Rao, 2007). If agricultural information is coupled with other factors of production, may lead to enhanced production and marketing of produce in this sector (Dralega, 2007). Such definitions tell the vitality of information in agriculture. Focus on the value of agricultural information should not be ignored as information has been described that the cumulative knowledge of individuals in all topics, ways from across all sources that could enable people of such information in creating batters and improving their practices intellectually. There is no wonder that information has significance across all aspects of agricultural advancement, including an enterprise's planning to market its products. Tadesse (2008) defined agricultural information as the "various sets of information and messages relevant to farmers' agricultural production

activities such as crop production and protection, animal production and management, and natural resource production and conservation". Accordingly, for this study, agricultural information refers to data relating to agriculture which are processed into substantive and meaningful forms for successful decision-making in agriculture. "Information seeking behaviour is a broad term which includes a set of actions that an individual take to express information needs, seek information, evaluate and select information, and finally, use this information to satisfy his/her information needs" (Majid and Kassim 2000). "Information-seeking behaviour is purposive in nature and is a consequence of a need to satisfy some goal" (Tadesse, 2008). Farmers are eager to seek out and use information that might help them in up scaling their productivity and revenue. Mostly farmers prefer an interpersonal medium of communicating and disseminating information on relevant topics (Owolade & Kayode 2012). Information and Communication Technology is a combination of computer technology, communication technology and information management technology. It helps in making efficient communication process due to their ability to process both texts and pictorial representations in true form. Such technologies can overcome temporal and spatial obstacles in communication and, more so, in completing the feedback pathway to the source. The application of ICTs in farming has revolutionised different agricultural production and productivity

facets. Mobile phones, one of the vibrant and reliable ICT gadgets, promises to bridge the information gap among the farming community. One recent testimony is the development of "Mobile Masterjee" by IIT Kanpur for virtual classroom teaching during the COVID-19 pandemic (Singh, 2020). In a nutshell, "information and communication technologies (ICTs) usage and applications, the mobile phone has been regarded as a more accessible and less expensive means to close the digital divide" (Wade, 2002). Cell phones turn many users' lifestyles and are highly accepted as a significant forum for today's and future technologies. Mobile technologies are considered valuable for advancement, as they give owners advantages such as mobility and security (Donner, 2006). Due to their specific radio spectrum operational features, they do not need to depend on physical infrastructure such as highways and telephone lines, and base stations can indeed be driven through their own generators in areas with no electric grid. Mobile phones use the radio spectrum, so they hardly require any physical facilities like highways, telephone cables, etc. (Anon., 2008). Cell phones need mainly simple knowledge and thus are available to a substantial part of the population. In addition to vocal communication, mobile phones enable data transmission that could be used in applications for health, education, market and governance purposes. Consequently, mobile phones experience many technological advantages that enable their greater potential and significance for agricultural and rural development. In present era information centricity, social media is perceived as innovative platform became popular among adolecents for convey information among mass of population by overlooking time and distance constraints (Patra & Gogoi, 2021). Mobile phones are emerging as a vital tool for agricultural extension. Its attractive features such as wire-lessness, portability, affordability, accessibility, instant and transparent, linguistic feasibility etc make this unique. Mobile phones give owners benefits such as connectivity and security (Donner, 2006). These gadgets need reading comprehension and are thus functionally literate people may operate the device smoothly. They enable data transmission and can be applied for several purposes like health, education, trade or governance purposes. Due to the increasing contest in the private sector and advanced payment methods (ex. prepaid method), mobile phones are readily accessible and affordable among the lower strata of society. A quite few investigations have been done in respect of mobile phone usage, typically in agriculture and its allied sector development (Agarwal, 2010; Rashid and Elder, 2009). Mobile phone technology can boost the information-seeking behaviour of farmers in the right direction. The right information in the right time at the right place is vital for successful farming by farmers.

MATERIALS AND METHODS

Exploratory research was conducted in the purposively selected area, i.e., the Sitapur district of Uttar Pradesh.

A simple random sampling method was applied to select blocks, villages, and respondents to eliminate bias and get precision in results. Based on the lottery method, two blocks were selected randomly, *viz.* Bisawan and Maholi. A list of villages was prepared from each selected block, assuming maximum mobile phone users in villages. Three villages from each selected block and fifteen farmers from each selected village were chosen randomly. So, in six villages, a sum of 90 respondents was selected for the study.

A scale developed by Yadav (2019) was used with appropriate modifications to measure the information-seeking behaviour through mobile. The ISB through mobile measuring scale comprised four different components *viz.* extent of availability, frequency of use, the extent of importance and extent of satisfaction. The procedure for measuring each component of information-seeking behaviour through mobile had been briefly explained as a three continua Likert based scale used to categories as low, medium and high levels by following the scoring procedures 1, 2 and 3 respectively with the help of mean and standard deviation. Each component of the scale consists of 14 statements. This means the minimum and maximum scores could range between 14 to 42 for each component. The total score for each continuum was obtained by multiplying its respective score with the sum of scores given by respondents for each statement. The final score for the extent of availability was obtained by adding the total score calculated from all three continua. The same procedure was followed to compute the final score of remaining components like the extent of importance, frequency of use and level of satisfaction. The final score for information seeking behaviour through mobile was obtained by taking an average of all four components scores, which was considered for regression analysis.

A range of predictor variables were also collected that might act as explanatory variables for ISB through mobile of the respondents. These explanatory variables include 13 variables viz., Age, Family size, Category (caste), Education, Family Education Status, Experience in Farming, Social participation, Occupation, Annual family income, Land-holding, Source of credit, Mass media exposure and Extension contact. Thus, thirteen variables were initially selected to explore the degree of association between these independent and dependent variables, but only nine were fitted in the multivariate regression model. Before applying the SMRA model, the importance of unstandardised regression coefficient (B) and standardised regression coefficient, Beta ( ), were explored. The standardised regression coefficient, Beta ( ), is more appropriate to use (Nardi, 2006). So, the standardised beta coefficients were used to compare the importance of each variable in predicting ISB. value communicates the direction (whether positive or inverse) and the weighting of the independent variable relative to the other independent variables in explaining the variation of the dependent variable (Lal *et al.,* 2016).

RESULTS AND DISCUSSION

The Information Seeking Behaviour of Farmers Through Mobile

Information seeking behaviour of farmers through mobile was measured on four different dimensions. The results obtained by comprehensive analysis of answers mentioned by respondents in a structured schedule were distinctly figured in succeeding tables and explanations.

Extent of availability: From Table 1, the extent of availability refers to the availability of various applications related to agriculture and its allied aspects in respondents' mobile phones. Table 1 revelled that over 60% of respondents' mobile phones were found an average availability of such features. On the other hand, 22.22% of respondents' devices found maximum availability; however, only 13.33 per cent found little or non-availability of such applications. It can be concluded from the above table that more than 86% of cellular devices were installed in abundant mobile applications.

Frequency of use: Although only availability and importance are insufficient, frequent use is also required. So, the frequency of usage of these applications was measured and found that 71.11 per cent of the respondents occasional. On the other hand, 16.67 per cent of respondents have regular use and keep updated themselves on an almost daily basis with the latest information in relevant subjects. Only 12.22 per cent of respondents hardly use the available features (Table 1).

Extent of importance: This refers to the degree of importance of various applications and features providing information related to agriculture and allied perceived by the respondents. It is noteworthy from the above table that more than two-thirds (66.67%) of selected respondents were given fair importance to access the information from various sources, while 12.22% of respondents were perceived least important. Rest 21.11% of identified respondents remarked mobile phones would be most important in gathering real-time information (Table 1).

Extent of satisfaction: Satisfaction level respondents with mobile services can be recognised from the table; more than half (78.89%) of the selected farmers were getting moderate satisfaction. Further, just 7.78% of selected farmers in the research locale were hugely satisfied with such characteristic features of mobile phones; however, 13.33% of farmers were not pleased with affairs to seek any agricultural information through mobile phone devices. By keeping these findings in mind, it can be concluded that many respondent farmers admitted that such a digital mode of information seeking is quite helpful and reasonable satisfaction (Table 1).

It is evident from the above findings and discussion that most of the respondents were admitted that smartphone devices could play a paramount role and lead to optimistic changes in their style of information seeking. They are also convinced that such technological devices may prove cost-effective and provide tailor-made, instant, and unbiased information. Yet, despite it, few respondents were not professed with them.

Robustness of the regression model. The significant F-value (22.974), meagre standard error of the estimate, and high R^2 value show that the model's overall fit was satisfactory (Table 2 and 3). Furthermore, table 2 revealed that multiple correlations (R) are 0.849 and the coefficient of determination (R^2) is 0.721, which is 72.1 per cent of the variation in ISB through mobile among the sample of 90 respondents is explained by these nine variables working together (Lal *et al.,* 2021).

Table 1: Information Seeking Behaviour of Farmers Through Mobile (N= 90).

Extent of availability	Frequency	Percentage	
Least Available (< 21.91)	12	13.33	Mean = 25.27 SD = 3.35
Available (21.91 – 28.62)	58	64.44	
Most Available (> 28.62)	20	22.22	
Frequency of use	**Frequency**	**Percentage**	
Rarely (< 19.88)	11	12.22	Mean = 23.80 SD = 3.92
Occasionally (19.88 – 27.72)	64	71.11	
Regularly (> 27.72)	15	16.67	
Extent of importance	**Frequency**	**Percentage**	
Least Important (< 20.22)	11	12.22	Mean = 23.87 SD = 3.64
Important (20.22 – 27.51)	60	66.67	
Most Important (> 27.51)	19	21.11	
Extent of satisfaction	**Frequency**	**Percentage**	
Unsatisfied (< 17.61)	12	13.33	Mean = 22.09 SD = 4.48
Moderately Satisfied (17.61 – 26.57)	71	78.89	
Full satisfied (> 26.57)	07	7.78	
*The minimum and maximum possible score were 14 and 42 for the respondents.			

Table 2: Model Summary of information-seeking behaviour through mobile (dependent variable) of the respondents.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.849	.721	.690	7.078
a. Predictors: (Constant), Extension contact, Age, Family size, Source of credit, Annual family income, social participation, Education, Mass media exposure, Experience in farming. b. Dependent Variable: Information seeking behaviour through mobile.				

Table 3: ANOVA value representing the suitability of regression model.

Sr. No.	Model	Sum of Squares	df	Mean Square	F
1.	Regression	10359.641	9	1151.071	22.974***
2.	Residual	4008.315	80	50.104	
	Total	14367.956	89		

Relational analysis of ISB through mobile and selected independent variables

The regression analysis fitted to the data to analyse the ISB through mobile gave interesting findings (Table 4). In contrary to a priori expectation; Age, Family size, experience in farming were not found to have a significant influence on ISB through mobile. The variables which had a significant influence on ISB through mobile are explained in detail:

Education: From Table 4, education helps build logical thoughts that lead to rational decision-making in individuals. Education was statistically significant at p<0.01, with 't' statistics value of positive 3.954. Therefore, the probability of ISB through mobile was likely to increase by a factor of 0.282 (-value) with a unit increase in education, which is in line with the expectation because educated respondents were very much interested in adopting such technologies for satisfying their purpose. Moreover, such respondents can comprehend the technical features of mobile phones and can efficiently utilise their extraordinary services.

Social participation: It was statistically significant at p<0.05, with the 't' statistics value of 3.009. The probability of ISB through mobile was likely to increase by a factor of 0.210 (-value) with a unit increase in social participation. This revealed that respondents have active involvement in social organisations like NGOs, FPOs, FPCs, etcetera and the more significant number of contacts with their progressive society members increasingly trying and learning such digital platform of information seeking (Table 4).

Annual family income: It was statistically significant at p<0.01, with the 't' statistics value of 3.913. The probability of ISB through mobile was likely to increase by a factor of 0.264 (-value) with a unit increase in family income. If one earns sufficiently, can afford an android mobile phone and significantly benefitted even from chargeable services. Farmers with assured income can recharge their phones with a data pack and access the information available on the cloud (Table 4).

Source of credit: On season credit financially assist the farmers and help with the requirement of quality inputs. It was found to be statistically significant at p<0.10, with the 't' statistics value of 1.690. The probability of ISB was likely to increase by a factor of 0.107 (-value) with a unit increase in the selected variable. Many banks facilitate online access to credit. Progressive and technically competent respondents are utilising such services (Table 4).

Mass media exposure: MME was statistically significant at p<0.05, with the 't' statistics value of 2.505. The probability of ISB through mobile was likely to increase by 0.235 (-value) with a unit increase in MME. Many mass media and ICT platforms are available, but their exposure to the beneficiaries is quite limited. Respondents who have greater exposure to such platforms progressively increase the ISB of respondents (Table 4).

Extension contacts: It was statistically significant at p<0.05, with the 't' statistics value of 2.045. The probability of ISB through mobile was likely to increase by a factor of 0.188 (-value) with a unit increase in Extension contacts. A wide variety of information is available on the internet. This creates difficulties for farmers to search the relevant information. Frequent contact of the farmers with extension agents and subject matter specialists can be helpful to get relevant information from authentic sources (Table 4).

Table 4: Multivariate regression analysis of independent variables with ISB of the respondents through mobile.

	Model	Correlation Coefficients (r)	Unstandardized Coefficients		Standardized Coefficients β-value	t-value	p-value
			B	SE			
1.	(Constant)		59.072	4.786		12.341	.000
2.	Age	0.069	.118	.130	.106	.907	.367
3.	Family size	-0.043	-.444	.427	-.065	-1.040	.301
4.	Education	0.639**	2.345	.593	.282	3.954	.000***
5.	Experience in farming	0.101	-.207	.151	-.166	-1.369	.175
6.	Social participation	0.562**	2.362	.785	.210	3.009	.004***
7.	Annual family income	0.520**	.000	.000	.264	3.913	.000***
8.	Source of credit	0.363**	1.581	.936	.107	1.690	.095*
9.	Mass media exposure	0.598**	.423	.169	.235	2.505	.014**
10.	Extension contacts	0.600**	.434	.212	.188	2.045	.044**
a. Dependent Variable: Information seeking behaviour.							
***, ** & *, depict value is significant at 1, 5 & 10% levels respectively (2-tailed).							

CONCLUSION

Farmers admitted that the android cell phone could be a landmark in filling the information gap among the stakeholders. Features like portability wireless connectivity make this very special. In this study, farmers' information-seeking behaviour through mobile was measured and found that the majority (57.58%) of the respondents' mobile phones were installed an average number of mobile features and applications in their cell phones. More than half (64.66%) of the respondents occasionally used accessible applications on their mobile phones. The present study observed that more than two-thirds (68.89%) of respondents perceived significant importance of such information sources. This investigation also found that 57.78% of respondents were moderately satisfied with the information obtained by these sources. In a nutshell, 71.11% of farmers had a medium level of information-seeking behaviour. The remaining 16.67% had a higher level, and 12.22% of farmers came under low information-seeking behaviour. SMRA model reinforced that explanatory variable viz., education, social participation, annual family income, source of credit, mass media exposure and extension contact should be given due emphasis if the ISB of the respondents has to be increased in all the four sub-components. The presented study concludes that education, social participation and annual family income are positively significant at a 1% significance level. These factors have a powerful effect on improving farmers' ISB in agriculture. Mass media exposure and extension contact are also significant at 5% per cent level of significance. It explains that those farmers exposed to sufficient mass media and more contacts with extension agents and experts can smoothly operate the mobile phone. These farmers can know the relevance and authenticity of the information. Credit sources are also significantly associated but have comparatively less impact because farmers are very conservative in the online banking system. In a nutshell, the above-explained variables need the policymaker's attention to improve the information-seeking behaviour of farmers through mobile and strengthen their decision-making power.

FUTURE SCOPE

With the advancement of ICT tools and multimedia, the study has much broader scope. In the 21st century most of the individuals are digital natives who are much interested in operating ICT gadgets and comfortable in seeking information through these media. These ICT tools provide platform to gather all sort of information at one place in a fraction of second. Digital natives can bring a radical technological advancement in forward looking society. Greater use of ICT tools will also be quite applicable in precision agriculture.

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