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Effectiveness of Agricultural Information Disseminated Through Mobile Apps and Social Media

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ABSTRACT

The present investigation was conducted during June, 2021 to February, 2022 in twelve villages under DAATTC, six each in Bhuvanagiri and Jangaon districts, Telangana, India on the use of social media as a source of agricultural information, use pattern, preference, purpose, ranking of different social media used, information processing and its effectiveness among farmers. Social media emerged as highly powerful tools in facilitating online social interactions and has shown tremendous potential in facilitating information exchange among individuals. These tools are meant for digital communication helping in interaction among a group of people. The data were collected from farmers of Bhuvanagiri and Jangaon districts, with a sample size of 120 respondents through a structured interview schedule. 84.16% of the farmers used social media platforms for getting agriculture related information, the most preferred social media were WhatsApp, Youtube and Facebook. Garrett ranking analysis revealed that information seeking was the most preferred purpose of social media use among farmers followed by chatting/connecting with peers and watching agricultural videos. 54.17% of the farmers preserved this information obtained from social media for future use. 45.00% of them discussed this information with progressive farmers and 42.50% of them discussed with friends. 72.50% of the respondents had enhanced knowledge about pest and diseases. The personal variable of the respondents' such as education, farm-size, scientific orientation, social participation, income, innovativeness and information seeking behaviour were significant and positively correlated (at 0.01% level of probability) with social media use.

KEYWORDS: Agricultural information, dissemination, effectiveness, social media

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1. INTRODUCTION

The emergence of social media platforms at the beginning of 21st century has an immense impact on global communications systems as stated by Bakare et al. (2015), social media tools have paved way for millions of people across the world to locate, connect, make friends, share ideas, solicit support, and mobilize people with similar interest (Kaur et al., 2022). Social media tools are cost effective and flexible to use because of this reason it is reaching more number of stakeholders (Jaya et al., 2021) and catering the needs of farmers like information on latest varieties, weather patterns, crop production techniques to name a few (Narendra et al., 2022).

Social media are web-based tools of electronic communication that allow users to personally interact with others individually or in groups for the purposes of exchanging information, sharing thoughts, opinions, influencing and facilitating decision-making by creating, storing, retrieving and exchanging information in any form (text, pictures, video etc.) by anyone in the virtual world (Anonymous, 2016; Anonymous, 2013). Social media also helps farmer to connect with extension agents, specialists, facilitates mass-personal communication (Carr and Hayes, 2015) and to get real time solution to their specific problems (Kerlinger and Katz, 1976; Joshi and Dhaliwal, 2019). Social media is a collection of internet-based communities that allow users to interact with each other online. It is used for information, entertainment, online marketing, communication and transfer of technology (Ansari and Pandey, 2013).

Social media has now become, a mainstream form of communication across the globe and its influence is increasing with the rise in the number of smart phone users (Lathiya et al., 2015) although television, radio, agriculture officers, progressive farmers and other personal sources still dominate into strong group of information sources, usefulness and overall agricultural information system (Ravikumar et al., 2015; Nain et al., 2015). They are mostly used to get benefit of general communication, entertainment purpose (Panda et al., 2019) and assists to connect with peers through maintaining a continuous connection with technology (Boppana et al., 2019; Cabral, 2011). The acceptance of social media has increased among all sections of the society (Meera et al., 2018). Thus, various applications, tools, platforms, functions and features have been evaluated (Sandeep et al., 2022b) as such developing awareness and skill of the farmers to use ICT tools for their farming benefits is required (Parmar and Kumar, 2020; James et al., 2020). Social media has been the fastest adopted media technology in the world as it took around 38 years for radio, 13 years for television, 4 years for iPod, 3 years for internet but one year for Facebook and 9 months for twitter to reach 50 million users (Anonymous, 2012; Sandeep et al., 2022a). The most popular social media used among the farming community is WhatsApp (Owiny et al., 2014), followed by Facebook, YouTube, Twitter and LinkedIn (Balkrishna and Deshmukh, 2017). The usage of social media is constantly increasing as they serve the purpose of larger sections of the community (Patra and Gogoi, 2021). A majority of farmers were using social media for receiving and sharing agricultural information (Panda et al., 2019; and Singh et al., 2017). Social media platforms are not only confined to transfer and sharing of agricultural information but also provide farmers with holistic knowledge about ongoing developments in their surroundings (Shanmuka et al., 2022). The extension mechanism for purposeful farmer to farmer learning exchange is also created which may lead to innovative farmer led extension delivery mechanism (Nain et al., 2019). Keeping these observations in view, this study aims to get an insight on the use of social media by farmers, use pattern and preferred social media platforms.

2. MATERIALS AND METHODS

The study was conducted during June, 2021 to February, 2022 in Bhuvanagiri and Jangaon districts of Telangana state, India that lies between 17.4533°N latitude, 78.9288°E Longitude with main focus on the use of social media as a source of agricultural information, use pattern, preference, purpose and ranking of different social media used, information processing and its effectiveness among farmers . The study was designed and responses were collected from farmers using social media. In line with the objectives of the study, ex-post facto research design was employed. The employed research design is a systematic experimental inquiry in which the researcher does not directly control on independent variables (Kerlinger and Katz, 1976). Sample was drawn by adopting purposive and random sampling techniques. Three (3) mandals from each district and two (2) villages from each mandal thus a total of twelve (12) villages were selected from six (6) mandals by simple random sampling technique. From each village ten farmers were selected purposively those farmers who were using smart mobiles, making 120 respondents for the study. The data were collected through personal interview technique with the help of structured interview schedule and analysed. A list of variables to be dealt with was prepared based on literature review related to the subject. Further, experts were consulted and finally, the variables that were found to be most relevant to the present study were selected. Ten profile characteristics i.e., age, education, farming experience, farm size, family size, social participation, innovativeness, scientific orientation, annual income, information seeking behaviour were selected for the study. In order to measure social-media use, the respondents were asked different questions, scores for these questions were added to get

overall score of the respondent and they were categorized into low, medium and high based on his/her total score using mean and standard deviation. Also, to get more clarity on the use of social media, respondents were asked to rank in order of preference, the purpose for which they use social media, most preferred social media etc and the ranking done by all the respondents were analysed using Henry Garret ranking technique.

Categorical variables were analysed through frequency and percentage whereas continuous variables were analysed and categorized into low, medium and high based on mean and standard deviation. To find the relationship of independent variables on effectiveness of social media, correlational analysis for continuous variables were done.

2.1. Correlation analysis

Pearson's correlation coefficient when applied to a sample is commonly represented by the letter "r" and may be referred as the sample correlation coefficient or the sample Pearson correlation coefficient. It is used with two variables (independent and dependent) to determine a relationship/ association.

3. RESULTS AND DISCUSSION

3.1. Socio-economic characteristics of respondents

It can be inferred from the study that nearly 47.50% of the farmers were in the middle age group with 80.00% of the farmers had upper school and above educational levels.

Nearly three quarters (67.50%) of the farmers had 2.5 acres or above farm size with 59.17% of the respondents had more than 10 years of experience in farming. The family size was restricted up to 4 members in 52.50% of the farm families, 42.50% of the respondents had membership in more than one organization, 43.33% of the farmers had high scientific orientation and 45.83% of the them had high innovativeness with more than 50.83% of the farmers having medium annual income, 52.50% of the farmers had medium information seeking behaviour. The results are in tune with the findings of Madhushekar et al. (2021) reported that most of the paddy farmers were middle aged and more than three quarters of the farmers had education above 7th class, Meena et al. (2013), Dhola and Pandya (2019) who reported similar findings with regard to farm size, farming experience and information seeking behaviour whereas Jat et al. (2021), Kumar et al. (2022), Madhushekar et al. (2022a) reported that nearly 50.00% of the farmers had nuclear families restricting to 4 members and nearly one fourth of Chilli and Groundnut farmers had membership in more than one organization (Table 1).

3.2. Different sources used by farmers for getting agriculture related information

It is evident from Table 2 that 84.16% of the farmers

Table 1: Socio-economic characteristics of respondents (n=120)

Sl. No.	Variables	Category	Frequency	Percentage
1.	Age	Young (24–39)	46	38.33
		Middle (40–54)	57	47.50
		Old (55–69)	17	14.17
2.	Education	Illiterate	09	7.50
		Primary school	15	12.50
		Upper school	22	18.34
		High school	29	24.16
		Above matriculation	45	37.50
3.	Farm size (in acres)	Marginal (0–2.5)	39	32.50
		Small (2.5–5)	58	48.33
		Large (5 and above)	23	19.17
4.	Farming experience (in years)	<10 years (less than 10years)	49	40.83
		11–20 years	53	44.17
		>20years (more than 20years)	18	15.00
5.	Family size	1–4 members	63	52.50
		5–8 members	43	35.83
		More than 8 members	14	11.67
6.	Social participation	No participation	17	14.17
		Membership in one organization	34	28.33
		Membership in more than one organization	51	42.50
		Membership with office bearer	18	15.00
7.	Scientific orientation	Low (1–9)	25	20.83
		Medium (10–18)	43	35.83
		High (19–27)	52	43.33
8.	Innovativeness	Low (1–8)	20	16.67
		Medium (9–16)	45	37.50
		High (17–24)	55	45.83
9.	Annual income	Low (up to ₹ 25000)	21	17.50
		Medium (₹ 25,000 to ₹ 50,000)	61	50.83

Table 1: Continue...

Sl. No.	Variables	Category	Frequency	Percentage
		High (More than ₹ 50,000)	38	31.67
10.	Information seeking behaviour	Low (<27.13)	17	14.17
		Medium (27.14–43.13)	63	52.50
		High (>43.13)	40	33.33

1US$=75.32 INR, February, 2022

Table 2: Distribution of respondents according to media used for getting information (n=120)

Sl. No.	Media	Response	percentage	Ranks
1.	Mobile phone/social media	101	84.16	I
2.	Newspaper/print media	81	67.50	II
3.	Television	75	62.50	III
4.	Neighbouring farmers	65	54.17	IV
5.	Public extension system (MAO's/ AEO's/Scientists)	58	48.33	V
6.	Radio	54	45.00	VI
7.	Computer	43	35.83	VII

used mobile phones or social media platforms for getting agriculture related information followed by Newspaper or Print media by 67.50% of the farmers and third preference was given to television by 62.50% of the farmers. The results are in unity with the findings of Sandhu et al., 2012, Singh et al., 2017 and Sethy and Mukhopadhyay, 2020 who reported that farmers used smart phones for getting agricultural information. Due to ease of receiving, retrieving and sharing, social media was the most preferred source of agricultural information among farmers.

3.3. Social media use

The data in Table 3 revealed that nearly 59.17% of the respondents belonged to medium category with respect to overall social media use followed by high category (30.83%). It can be concluded from the data that vast majority of farmers were actively using social media although their extent of use differs.

Affordable smart phones, improved connectivity in villages, cheaper data plans and increasing awareness about ICT might be the reasons for these results. The findings were also supported by Jat et al. (2021), Nirmalkar et al. (2022) and Singh et al. (2021) who revealed that majority of farmers (59.70%) were in medium group of ICT use and ease in usage is the primary reason for increase in usage of social networking platforms.

Table 3: Distribution of respondents based on overall use of social media (n=120)

Sl. No.	Category	Response	percentage
1.	Low (< 43)	12	10.00
2.	Medium (43–67)	71	59.17
3.	High (>67)	37	30.83

3.4. Preference, ranking and purpose of social media use

It can be inferred from Table 4 that getting agriculture related information (Rank 1st) was the most preferred option when it comes to purpose of social media use by the respondents (72.50%), followed by chatting/connecting with friends, peers and relatives (Rank 2nd) and watching

Table 4: Distribution of respondents based on purpose of social media (n=120)

Sl. No.	Category	Response	Percentage	Rank
1.	To get agriculture related information/ Information seeking	87	72.50	I
2.	Enquiring about new innovations and techniques/ Source of Knowledge	71	59.17	IV
3.	Link with agricultural institutions and Govt. agencies	55	45.83	VI
4.	Chatting/ connecting with friends, peers and relatives	83	69.17	II
5.	Watching agricultural Videos of successful farmers	77	64.17	III
6.	Marketing of agricultural products/ Interacting with buyers and sellers	51	42.50	VII
7.	Leisure activities, casual browsing and searching, group and video calls	67	55.84	V

agricultural Videos of successful farmers (Rank 3rd) with 69.17% and 64.17% of the farmers preferring them respectively. Marketing of agricultural products/Interacting with buyers and sellers (Rank 7th) and connecting with agricultural institutions and government agencies (rank 6th) were the least preferred options for 42.50% and 45.83% of the respondents respectively, who were asked to rank the purpose of their social media use. It can be concluded here that farmers used social media more for agriculture information and personal use than for professional purposes like building a network of potential buyers and sellers or connecting with govt. departments, agencies and agricultural institutions. Although, some progressive farmers were using social media for the purpose of learning about new innovations and techniques developed in the field of agriculture but usage among older farmers is low. The findings are in line with Jaya et al. (2021) and Kaur (2014) who stated that, online chatting, entertainment, news, networking and browsing were the main social media activities in which farmers were engaged in. Further, they concluded that most farmers lack proper knowledge of social media use in agriculture.

3.5. Ranking of different social media used by the farmers

It can be concluded from Table 5 that WhatsApp (rank 1st) was the most preferred choice of social media among the respondents (84.17%) followed by YouTube (Rank 2nd) and Facebook (rank 3rd) with 74.16% and 72.50% preferring it respectively. The results are in line with the findings of Balkrishna and Deshmukh (2017), who observed that YouTube, WhatsApp and Facebook were the most popular social media applications. Also, Instagram was ranked 4th (62.50%) while Pinterest (Rank 7th) was the least preferred social media among the farmers. Moreover, while Facebook, WhatsApp and YouTube were preferred by respondents across all categories, Instagram was generally preferred more by young farmers as compared to middle and old farmers whereas only a small group of well-educated farmers preferred Twitter. The findings are similar to Joshi and Dhaliwal (2019) who revealed that more than half of the farmers were regularly using Facebook while 82.00% and 78.00% farmers were using WhatsApp and YouTube respectively. Further, they revealed that more than 80.00% farmers never used Twitter while 78.00% farmers never used Instagram. The results were also supported by the study of Khou and Suresh (2018) which stated that YouTube was the most popular social media followed by Facebook and WhatsApp.

Table 5: Distribution of respondents according to ranking of different social media (n=120)

Sl. No.	Category	Response	Percentage	Rank
1.	Facebook	87	72.50	III
2.	Whatsapp	101	84.17	I
3.	You Tube	89	74.16	II
4.	Twitter	71	59.17	VI
5.	Telegram	73	60.83	V
6.	Instagram	75	62.50	IV
7.	Pinterest	34	28.34	VII

3.6. Information processing

It is observed from Table 6 that more than 54.17% of the farmers preserved the agricultural information obtained from social media for future use where as 47.50% of them made a note in dairy and 37.50% of the farmers had a cursory look. Some of the farmers memorize the information from social media (23.33%) and 17.50% of the respondents maintained separate files. Out of these 45.00% of them discussed this information with progressive farmers and 42.50% of them discussed with friends followed by discussion with agriculture experts of SAU/ state department/Input dealers (30.83%), discuss with family (28.33) and discussion with relatives (28.33). From table 6, it can also be summarized that farmers were preserving the agricultural information received through social media for future use, some noted in dairy, adopted a cursory look, memorizing information at times and evaluating this information by discussing it with progressive farmers, friends, experts and family members. The results are in conformity with the results of Sandeep et al. (2022a) who reported that cursory look ranked top in information processing among farmers using social media followed by note in dairy, memorize it, preserve literature and use when needed and maintain subject matter file.

3.7. Effect of use of social media on knowledge and agricultural practices followed by farmers

It is clear from Table 7 that 72.50% of the respondents had enhanced knowledge about pest and diseases because of exposure to social media followed by 70.83% had decreased use of insecticides. The use of social media has significant impact on knowledge and recommended practices of farmers (70.00%) followed by judicious or balanced use of fertilizers (67.50%) and knowledge about market prices (61.67%). The results are in unity with the findings of Tambade et al., 2019 who reported that knowledge on pests and diseases among farmers increased on exposure to social media apps.

3.7. Relationship between profile characteristics of respondents with social media use

It can be concluded from Table 8 that profile characteristics of the respondents' such as education, farm size, social participation, scientific orientation, innovativeness, annual

Table 6: Distribution of respondents according to information processing (n=120)

Sl. No.	Preservation of information	Response	Percentage	Method of evaluation	Response	Percentage
1.	Cursory look	45	37.50 (III)	Discuss with family	34	28.33 (IV)
2.	Note in dairy	57	47.50 (II)	Discuss with friends	51	42.50 (II)
3.	Memorize it	28	23.33 (IV)	Discuss with relatives	24	20.00 (V)
4.	Preserve and use in future	65	54.17 (I)	Discuss with progressive farmers	54	45.00 (I)
5.	Maintain separate files	21	17.50 (V)	Discuss with Agril experts	37	30.83 (III)

Table 7: Distribution of respondents according to effect of use of social media on knowledge (n=120)

Sl. No.	Field	Re-sponse	Per-centage	Rank
1.	Enhanced knowledge about pest and diseases	87	72.50	I
2.	Increased knowledge about recommended practices	84	70.00	III
3.	Balanced use of fertilizers	81	67.50	IV
4.	Knowledge about market prices	74	61.67	V
5.	Decrease in excessive use of insecticides	85	70.83	II

Table 8: Pearson correlation analysis on the socio-economic characteristics and yield attributes of cotton

Sl. No.	Socio economic characteristics	Pearson correlation	Significance
1.	Age	-0.206**	S
2.	Education	0.315**	S
3.	Farm size	0.359**	S
4.	Farming experience	-0.489**	S
5.	Family size	-0.248	NS
6.	Social participation	0.472**	S
7.	Scientific orientation	0.543**	S
8.	Innovativeness	0.675**	S
9.	Annual income	0.246**	S
10.	Information seeking behaviour	0.592**	S

NS: Non significant, *: Significant at (p=0.05) level of significance, **: Significant at (p=0.01) level of significance

income, information seeking behaviour were significant and positively correlated with social media use while age and farming experience had significant but negative relationship with social media use. This might be due to the fact that young farmers use great number of social media apps for multiple purposes as compared to old farmers who use lesser number of social media and for limited purposes. Further old aged and high farming experienced farmers have poor skills to revive information on social media and choose direct contact with experts rather than connecting digitally. This is supported by the study of Kaur and Singh (2021) and Kale et al. (2016) which revealed that social media use varied between different age groups and young generation spend greater time on social media than the older generation as expressed by Patra and Gogoi, 2021. Also, as social participation, contacts with extension functionaries, participation in extension activities increases use of social media, as farmers tend to make use of social media to build relationship, make connections and interact with peers and experts. Similarly, education makes farmer more capable of understanding the benefits of ICTs like social media and make their better utilization. The findings are like Joshi and Dhaliwal (2019) who revealed that age had negative relation with social media utilization while education has positive relationship. Further, Annual income also showed significant relationship as higher incomes means greater affordability which in turn affects availability and accessibility of modern ICT tools such as smartphones, desktops and laptops. The results are also supported by the Madhushekar et al. (2022c), Sandeep et al. (2022a), Raghuprasad et al. (2012), Madhushekar et al. (2022b) who found that education, farm size and annual income had positive and significant relationship with utilization of ICT tools.

4. CONCLUSION

Majority of farmers were in medium category of social media use and used smart phones for getting agricultural information and delivering content through social media platforms like YouTube, WhatsApp and Facebook in different formats for dissemination of information with technological advancement. For holistic development in agriculture, social media can be used as common platform to have enhanced knowledge, effectiveness and increase interaction with unreached, marginalized farmers.

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