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A Study on Farmers' Use of Social Media; Comparative Analysis of Mardin and Hatay Provinces

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ABSTRACT

This study was conducted in Hatay and Mardin provinces to investigate the tendency of farmers to use social media, the difficulties they face during the use of social media and the variables affecting the use of social media by farmers. The research consisted of data obtained from a face-to-face survey of 221 producers using proportional sampling method. Descriptive statistics were used for data analysis, and chi-square analysis was used to examine the relationships between variables. The results showed that the rate of producers using social media was 77.8% in Mardin province and 73.8% in Hatay province. Additionally, farmers mostly use social media for communication with families and access to new news. Also, the most commonly used social media applications in both provinces were WhatsApp and Facebook. As a result of this research, it was determined that farmers don't use social media sufficiently for agricultural activities, and it was suggested that farmers' organizations and related institutions should carry out information activities for farmers to encourage farmers to use social media efficiently.

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Introduction

Social media are mobile-based digital communication channels through which people can discuss, interact, and share information without time and space constraints. There are different definitions of social media; Sayımer (2009) defines social media as a general term for online tools and websites that create mutual interaction by allowing users to share information, thoughts, interests and knowledge, while Suchiradipta and Saravanan (2016) define it as web-based electronic communication tools that allow users to interact, create, share, receive and exchange information and ideas in any form that can be discussed, archived and used by anyone in virtual communities and networks. The most fundamental feature of social media is its high participation level. According to data from 2022, 4.75 billion people worldwide use social media platforms. This is a large number, representing almost 60% of the world's population (Anonymus, 2023).The three social media platforms with the most users in 2022 are reportedly Facebook (2.9 billion users), Youtube (2.5 billion users) and WhatsApp (2 billion users) (Anonymus, 2023). The fact that users have the opportunity to comment, share, and interact with other users in social media on any topic and area of their choice turns the one-way communication model of traditional media into a two-way one, allowing users to chat, discuss, shop, and socialize through social media(Ünür, 2016). Kuria (2014) emphasised that if the geographical and feedback limitations of traditional media are taken into consideration, social media allows people from different geographical regions, both local and international, to exchange ideas in different forums.

Instant and unlimited communication, supported by increasing mobile phones and Internet subscriptions worldwide, is an important opportunity to share information in visual and textual forms that can reach millions of people in seconds through social media. As a tool to support rural development, these information and communication technologies play an important role in reducing poverty by creating equal opportunities to access information and markets, use basic services (health, education, roads, water), and access and use public and financial services (Rad et al., 2013; Singh et al., 2015; Gülter et al., 2018). With the huge increase in the number of smartphone users over the last two decades, social media platforms have also been extensively used by rural people. Social media have the potential to create informed communities that can make better decisions to prepare for emerging challenges in the agricultural sector, such as climate change, global food price instability, unsustainable agricultural activities, and over-dependence on non-renewable energy sources. Social media also helps in

accessing and sharing information and content in rural areas where physical content such as books and libraries are not available. It provides a platform for information sharing to help rural youth access education, engage in economic agricultural activities, and increase youth participation by promoting agricultural entrepreneurship (Saravanan and Bhattacharjee, 2014; Suchiradipta and Raj, 2018). Technological change brings about new production methods and the use of technology in agriculture. In recent years, innovative approaches offered to farmers have spread widely, especially because of the development of information and communication technologies while accelerating the process of global mobility (Kaya, 2022).

This study was conducted in Hatay and Mardin provinces to investigate farmers' tendency to use social media, the difficulties they face during the use phase, and the individual characteristics that affect their use of social media. The study is considered important in terms of determining farmers' ownership of digital tools, sources of information about social media, and rural individuals' perspectives on social media. It is expected that the results of the research, conducted in two different provinces in two different regions, will provide important contributions to the literature in terms of providing data to policy makers, agricultural product marketing companies and public institutions, especially agricultural extension activities.

Materials and Methods

The main material of the research consisted of data obtained from face-to-face interviews with farmers in the Mardin and Hatay provinces. The research was conducted in Artuklu and Kızıltepe districts of Mardin province and Kırıkhan and Reyhanlı districts of Hatay province. The population size was based on the number of farmers registered in the farmer registration system in Hatay and Mardin provinces in 2021, and a proportional sample size was used to calculate the number of surveys (Newbold, 1995).

$$n = \frac{N \times p(1-p)}{(N-1)\sigma_p^2 + p \times (1-p)} \quad (1)$$

In the formula, n= sample size, N= population size, p= estimation rate (for a maximum sample size of 0.5), σp2 = variance of the rate (with 95% confidence interval and 5% margin of error). As a result of the calculation, the sample size was determined as 221 and the distribution of the number of questionnaires to the provinces was determined proportionally based on the number of farmers in each province. Interviews were conducted with 120 producers in Mardin province and 101 farmers in Hatay province. The data obtained from the survey were loaded into the SPSS package and analyzed using statistical methods appropriate for the purpose of the research. In this context, descriptive statistics (frequency, percentage, mean, etc.) related to farmers and companies are expressed as values. Chi-square analysis, a non-parametric test, was used to examine the relationships between the variables. The Chi-square test is used to test whether there is a difference between two or more groups and the main purpose is to determine whether the difference between the observed and expected frequencies is significant.

Results and Discussion

Findings on Farmers and Farms

Of the farmers participating in the study, 94.1% were male, 74.1% were aged 35-64 and the average age was 46.5 years. Among the farmers, 76.9% had social insurance. This rate was 65.6% in Mardin Province and 90.9% in Hatay province. In their study conducted in Hatay province, Kaya and Bostan Budak (2022) reported that 96.0% of farmers had social security. The average household size was 5.35±2.05 and this figure was found to be 6.15±2.11 in Mardin province and 4.35±1.42 in Hatay province. Acıbuca (2021), in a study conducted in Mardin province, reported the average number of households to be 6.6 persons. The proportion of producers with high school and higher education levels was found to be 53.4%, and it was found that there was a difference between the provinces investigated in terms of education level ($P<0.01$), and this rate was 42.6% in Mardin province and 66.6% in Hatay province. In the analyzed farms, 64.7 % of the producers were engaged in crop production only, 3.2 % were engaged in animal production only, and 32.1 % were engaged in both crop and animal production. In terms of agricultural activities, it was found that farmers in both provinces showed similar behaviours in terms of agricultural activities, and the proportion of farmers engaged in both crop and animal production activities was 31.1% in Mardin province and 33.3% in Hatay province. Therefore, it can be said that farmers with different levels of education, family size, and social security show similar behaviors in agricultural activities. It was found that 37.1% of the farmers surveyed were also engaged in non-agricultural activities, and this rate was 34.4% in Mardin province and 40.4% in Hatay province.

Among farmers engaged in non-agricultural activities, 48.8% were self-employed, 34.1% were employed in public institutions, and 17.1% were employed in the private sector. The average land size of the enterprises was 194.7 da in Mardin province and 150.1 da in Hatay province (Table 1). Among the farmers in the investigated holdings, 18.9 % produced horticultural crops, 70.2 % produced field crops, 3.2 % produced vegetable crops, and 7.7 % produced both fields and horticultural crops. 29.9% of the farmers participating in the study indicated that they had previously participated in farmers training activities, this percentage was 27.9% in Mardin province and 32.3% in Hatay province. The results of the Chi-square analysis showed that there was no significant difference ($p>0.05$) in the level of participation in farmer training activities between the provinces. Gülter et al., (2018) reported that as the educational level of farmers increases, the use of internet also increases. Kaya (2022) reported that many factors affect the adoption of innovations in agriculture, and the approach to using new technologies varies according to the age, gender, education level, income, and experience of individuals.

Farmers' Social Media Usage Habits

It was found that 96.8% of the farmers participating in the study used a mobile phone, 34.8% had a computer, and 25.0% had a tablet. The proportion of those who used e-mails was 31.2%, and the proportion of those who had social media accounts was 74.2% (Table 2).

Table 1. Some demographic characteristics of the farmers in the analysed provinces

Variable	Definition	N	%	Variable	Definition	N	%
Gender	Female	13	5.9	Social security	Yes	170	76.9
	Male	208	94.1		No	51	3.1
Age	21-34	38	17.3	Family size	1-3	37	16.7
	35-64	163	74.1		4-7	149	67.4
	65 +	19	8.6		7 +	35	15.8
Agricultural activity type	Crop	143	64.7	Education	Non-literate	2	0.9
	Animal	7	3.2		Primary school	75	33.9
	Both of them	71	32.1		Middle school	26	11.8
Other work	Public	28	34.1		High school	69	31.2
	Private sector	14	17.1		High school above	17	7.7
	Own enterprises	40	48.8		Graduate and over+	32	14.5
Non-agricultural work	Yes	82	37.1	Average land size (da)	Mardin	194.7	
	No	139	62.9		Hatay	150.1	

Table 2. Some demographic characteristics of the farmers in the analysed provinces

Variable	Province	N	%	χ^2	P
Mobile phone users	Mardin	120	98.3	1.222	0.411
	Hatay	94	94.9		
	Mean	214	96.8		
Those who have a computer	Mardin	21	17.2	38.087	0.000
	Hatay	56	56.5		
	Mean	77	34.8		
Those who have a tablet	Mardin	10	8.2	41.916	0.000
	Hatay	45	45.9		
	Mean	55	25.0		
Those who use e-mail	Mardin	42	34.4	1.302	0.307
	Hatay	27	27.3		
	Mean	69	31.2		
Social media users	Mardin	95	77.8	0.512	0.528
	Hatay	73	73.8		
	Mean	168	74.2		

The proportion of farmers who used social media was 77.8% in Mardin province and 73.8% in Hatay province. There was a statistically significant difference ($P<0.01$) between provinces in terms of having a computer and tablet. Altıntaş (2019) reported that 96.7% of farmers owned smartphones, 59.0% computers, and 40.0% tablets in a study conducted in İzmir province. Altın and Demiryürek (2021) reported that 18.6% of farmers owned desktop computers, 11.4% owned tablets, and 68.2% owned mobile phones in their study in Tokat province. Therefore, it can be said that the technological devices owned by farmers in different regions are not similar. In a study conducted by Kaya and Bostan Budak (2023) in Hatay Province, it was found that the level of education of the farmers affected the use of computers and the internet; about half of the farmers had a computer and about 70% of them could access the internet.

Farmers who didn't use social media were asked why they don't use social media and it was stated that they could tick more than one option and the following results were obtained: those who do not know how to use social media 75.8%; those who think that social media is harmful 54.0%; those who say that they do not know what social media is 46.8%; those whose mobile phones are not compatible 36.7%; those with insufficient budget 26.1%; those with insufficient internet service where they live 8.7%. In terms of provinces, the percentage of individuals who reported not using social media due to a lack of knowledge was 91.6% in Mardin and 65.8% in Hatay. Gülter et al., (2018) found that 65.8% of farmers had an e-mail address and 85.1% had a Facebook account.

The social media platforms used by farmers in the analyzed provinces are presented in Table 3. It was found that in both provinces, farmers mainly used WhatsApp (98.8%) and Facebook (87.3%). It was found that there was a statistically significant difference between the provinces at the 0.05 level for the use of Instagram and Facebook, and at the 0.01 level for the use of Twitter and Youtube, which was attributed to the higher average of users in Mardin province. In the study by Gülter et al., (2018) in Menderes district, 65.8% of farmers had an e-mail address and 85.1% of them were Facebook users. Among the farmers who used social media, 86.5% used it daily, 12.4% used it a few times a week and 1.1% used it monthly. The results showed no difference in the frequency of using social media among the provinces surveyed ($P>0.05$), indicating similar habits across regions.

Farmers involved in the study utilize smartphones, computers, and tablets to access social media platforms. In both provinces, nearly all of them use mobile phones to access social media. Furthermore, the percentage of farmers using a computer (57.1%) and a tablet (46.4%) to access social media is higher in Hatay province than in Mardin province (Figure 1). It was found that a statistically significant difference existed between the tools used to access social media in different provinces. While there was

a significant difference in the tools used between the provinces for computers ($\chi2$=25.360; P<0.01) and tablets ($\chi2$=23.735; P<0.01), the difference was not significant for mobile phones ($\chi2$=4.293; P>0.05). Kaya and Bostan Budak (2022) suggest that farmers use social media to obtain meteorological information.

The purpose of social media use of farmers is similar in both provinces, although the level of importance varies. In Mardin province, communication with friends and family (2.72±0.495), obtaining new news (2.54±0.501), being informed about agricultural innovations (2.43±0.593), following product prices (2.30±0.724), general culture (2.14±0.707) and following technological developments (2.13±0. 671); whereas in Hatay province, it was determined that it was used for obtaining new news (2.79±0.442), communication with friends and family (2.79±0.502), general culture (2.72±0.610), following technological developments (2.71±0.592), agricultural innovations (2.64±0.589) and following product prices (2.56±0.690) (Table 4). However, it was understood that social media wasn't preferred in e-commerce activities such as buying and selling products/inputs for both regions. In addition, Cronbach's Alpha coefficient of the scale used shows that it is a highly reliable scale for both provinces (Table 4). Furthermore, the difference between the provinces in terms of the purpose of farmers' use of social media was found statistically significant. While there is a statistically significant difference between provinces for following agricultural innovations ($\chi2$= 9.382; P<0.01), learning product prices ($\chi2$=8.537; P<0.05), selling products ($\chi2$= 25.936; P<0.01), finding markets ($\chi2$=14.153; P<0.01), learning input prices ($\chi2$=16.771; P<0.01) and disease-pest control ($\chi2$=12.593; P<0.01), while the difference between provinces for the purpose of purchasing products ($\chi2$=2.624; P>0.05) and sharing agricultural experience ($\chi2$=4.859; P>0.05) was found to be insignificant. In their study in Adana, Eseryel and Bahşi (2022) state that 57.58% of farmers say the most important source of information about agricultural innovations is the internet. In their study, Kumlu et al. (2019) stated that the use of social media and marketing method dimensions creates a competitive advantage in terms of awareness and attractiveness. In his research, Avcı (2023) also reported that production-cultivation methods, tool-equipment construction and use, and product purchase-sale recommendations can be made through the aforementioned content in agriculture and animal husbandry. Kara (2018) analysed the content of websites, social media pages and mobile applications of agricultural product sellers and stated that marketing activities are available in new communication environments. Mishra et al., (2022) reported that in India watching videos was the most preferred purpose of social media use among farmers followed by chatting/ connecting with peers.

It has been concluded that there are obstacles and certain problems with farmers' usage of social media in the provinces studied. The large amount of adverts on social media platforms has been identified as a significant issue for farmers in both provinces.

Table 3. Social media applications used by farmers

Social Media	Province	%	χ^2	P	Social Media	Province	%	χ^2	P
Instagram	Mardin	73.2	8.257	0.034	Youtube	Mardin	76.2	14.660	0.001
	Hatay	68.8				Hatay	59.2		
	Mean	71.2				Mean	68.7		
Facebook	Mardin	92.8	5.845	0.021	Whatsapp	Mardin	98.0	1.466	0.510
	Hatay	80.5				Hatay	100.0		
	Mean	87.3				Mean	98.8		
Messenger	Mardin	56.7	3.721	0.156	Twitter	Mardin	31.9	13.049	0.001
	Hatay	68.8				Hatay	45.4		
	Mean	62.1				Mean	37.9		

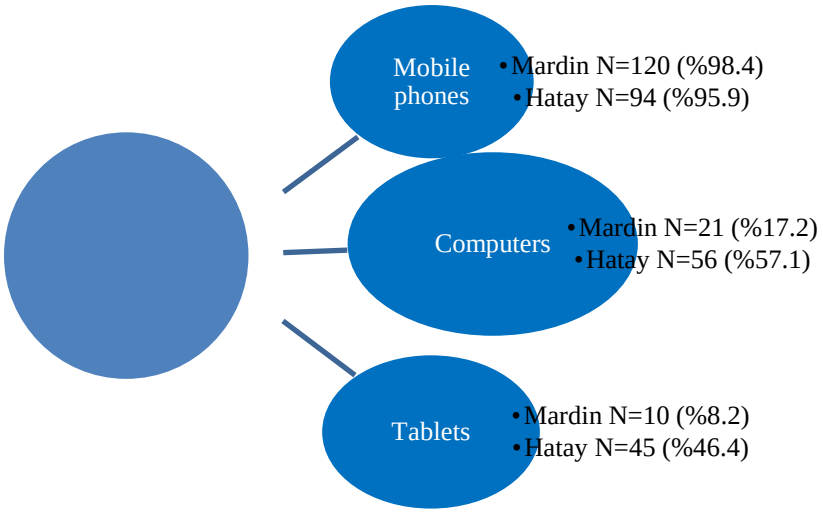

Figure 1. Tools used by farmers for social media outreach (Mardin-Hatay)

Table 4. Farmers' purposes of using social media platforms

Purposes (Mardin)	Mean	SD	Purposes (Hatay)	Mean	SD
Communication with friends and family	2.72	0.495	To learn new news	2.79	0.442
To learn new news	2.54	0.501	Communication with friends and family	2.79	0.502
Agricultural innovations	2.43	0.593	General culture	2.72	0.610
Product prices	2.30	0.724	Technological information	2.71	0.592
General culture	2.14	0.707	Agricultural innovations	2.64	0.589
Technological information	2.13	0.671	Product prices	2.56	0.690
Product purchase	2.07	0.794	Knowledge in irrigation systems	2.42	0.783
Sharing experiences	2.06	0.761	Getting information about product types	2.40	0.744
Obtaining information about subsidies	2.05	0.683	Input price learning	2.26	0.822
Getting information about product types	2.04	0.763	Control of diseases and pests	2.25	0.801
Information about irrigation systems	1.99	0.872	Obtaining information about subsidies	2.22	0.791
Input price learning	1.94	0.689	Sharing experiences	2.10	0.858
Buying seeds/seedlings	1.94	0.733	Finding a market	2.08	0.900
Control of diseases and pests	1.88	0.740	Product purchase	2.04	0.863
Selling products	1.85	0.768	Buying seeds/seedlings	1.97	0.919
Finding a market	1.76	0.747	Selling seeds/seedlings	1.82	0.909
Selling seeds/seedlings	1.76	0.704	Selling products	1.81	0.959
N		97	N		72
Cronbach's Alpha		0.873	Cronbach's Alpha		0.926

Scale 1=Never 2=Sometimes 3=Always SD: Standart deviation

Table 5. The difficulties faced by farmers when using social media

Difficulties (Mardin)	Mean	SD	Difficulties (Hatay)	Mean	SD
Too many adverts	2.40	0.640	Too many adverts	2.60	0.623
Lack of foreign language	2.40	0.702	Smartphones are expensive	2.39	0.822
Inadequate internet access	2.22	0.696	Computers are expensive	2.37	0.871
Internet is expensive	2.21	0.735	Insufficient internet quota	2.30	0.840
Computers are expensive	2.16	0.850	Internet is expensive	2.30	0.857
Smartphones are expensive	2.08	0.850	Security problems (virus, etc.)	2.26	0.811
The information is not secure	2.07	0.633	Information is not secure	2.21	0.740
Insufficient internet quota	1.99	0.757	Lack of foreign language	2.19	0.822
I cannot use the media effectively	1.86	0.736	Inadequate internet access	2.10	0.705
Security problems (virus etc.)	1.84	0.702	Insufficient time	1.86	0.708
Internet use is complex	1.80	0.716	Internet use is complex	1.83	0.884
Insufficient time	1.80	0.656	I cannot use the media effectively	1.77	0.802
I cannot use a computer/phone	1.75	0.722	I cannot use a computer/phone	1.40	0.710
N		97	N		70
Cronbach's Alpha		0.814	Cronbach's Alpha		0.865

Scale 1=Never 2=Sometimes 3=Always SD: Standart deviation

Lack of foreign language skills (2.40±0.702), inadequate internet connection (2.22±0.696), expensive internet (2.21±0.735), computers (2.16±0.850) and mobile phones (0.08±0.850) were identified as the main challenges faced by farmers in Mardin. In Hatay province, after the excess of advertisements (2.60±0.623), the cost of smart phones (2.39±0.822) and computers (2.37±0.871), insufficient internet quota (2.30±0.840), the cost of internet (2.30±0.857) and security problems (2.26±0.811) were found to be important. In addition, the scale used for the difficulties encountered by the farmers in the use of social media was found to be highly reliable for Mardin (Cronbach's Alpha: 0.814) and Hatay (Cronbach's Alpha: 0.865) provinces (Table 5). In addition, it was determined that there was a statistically significant difference between the provinces in terms of the difficulties encountered by the producers in the use of social media. While it was determined that there was a significant difference between the provinces in terms of insufficient internet quota ($\chi2$=12.261; P<0.01), excessive advertisements ($\chi2$=6.433; P<0.05), expensive internet ($\chi2$=9.811; P<0.01), complex internet use ($\chi2$=13.018; P<0.01) and not trusting the information on the internet ($\chi2$=6.809; P<0.05), while there was no statistically significant difference between the provinces in terms of insufficient internet access ($\chi2$=0.956; P>0.05), not knowing how to use social media effectively ($\chi2$=3.419; P>0.05) and lack of foreign language ($\chi2$=5.423; P>0.05). In their research in the UK, Burbi and Rose (2016) found that limitations in the use of social media still include access to fast and reliable interconnections and the availability of spare time to browse through the mass of Twitter feeds, Facebook updates and forum feeds.

The significance of information sources for the participating farmers differs according to the provinces. For Mardin and Hatay, agricultural engineers are regarded as the foremost source of information. However, the study reveals that in Mardin province, dealers (2.10±0.757), independent and private consultants (2.01±0.784), cooperatives (1.80±0.874) and traders (1.78±0.767) are the most significant information sources.

Table 6. Farmers' sources of information on social media

Sources of information (Mardin)	Mean	SD	Sources of information (Hatay)	Mean	SD
Agricultural engineers	2.27	0.685	Agricultural engineers	2.22	0.692
Dealers	2.10	0.757	Factories	1.93	0.805
Freelance/private consultants	2.01	0.784	Consumers	1.93	0.822
Cooperatives	1.80	0.874	Dealers	1.90	0.802
Traders	1.78	0.767	Traders	1.89	0.774
Input producing companies	1.65	0.596	Freelance/private consultants	1.85	0.681
Public institutions	1.49	0.614	Exporters	1.85	0.828
Factories	1.28	0.535	Input producing companies	1.81	0.793
Consumers	1.25	0.501	Cooperatives	1.66	0.786
Exporters	1.10	0.338	Public institutions	1.63	0.808
N		97	N		73
Cronbach's Alpha		0.810	Cronbach's Alpha		0.935

Whereas in Hatay province, factories (1.93±0.805), consumers (1.93±0.822), dealers (1.90±0.802) and traders (1.89±0.774) were deemed the primary sources of information. Furthermore, the Cronbach's alpha coefficient for both provinces shows that the scale used is highly reliable (Table 6). It was found that there is a statistically significant difference between the provinces in terms of the sources of information used by farmers. There is a significant difference between the provinces for public institutions ($\chi2$=11.074; P<0.01) and factories ($\chi2$=32.006; P<0.01). There is no significant difference between the provinces for agricultural engineers ($\chi2$=0.215; P>0.05), agricultural advisors ($\chi2$=5.424; P>0.05), pesticide/fertiliser dealers ($\chi2$=3.810; P>0.05) and traders ($\chi2$=0.660; P>0.05). Caffaro et al., (2020) reported in their study in Italy that the most important sources of information for farmers were consultants and farmer organizations.

Conclusion

Hatay and Mardin provinces served as the research sites for this study, which looked into how often farmers use social media, the challenges they encounter when using it, and the personal traits that influence that use. As a result of the research, it was found that producers in Hatay province have a higher level of education and are more likely to use technological tools. Additionally, farmers in both provinces show similar patterns of behaviour in terms of agricultural activities, with similar rates of crop and animal production. However, the participation rate in agricultural training activities is low. The percentage of farmers using social media was 77.8% in Mardin province and 73.8% in Hatay province. The most commonly used social media platforms in both provinces are WhatsApp and Facebook. Moreover, it has been found that farmers participating in the study access social media through instruments such as mobile phones, computers, and tablets, and the percentage of those who access social media via mobile phones is about 100% in both provinces. Although the amount of relevance varies, farmers' aims for using social media in both regions are similar. Furthermore, farmers primarily use social media to communicate with friends/families and to learn about new events. Learning technological information and receiving information about agricultural developments are among the primary objectives of using social media for agricultural activities. While farmers stated that they were mostly disturbed by advertisements while using social media, farmers in Mardin province stated that lack of foreign language and farmers in Hatay province stated that the cost of smart phones as the difficulty of using social media. Also, agricultural engineers are regarded as the first source of knowledge regarding agricultural activities in both provinces.

As a result of the research, it was concluded that the use of social media by farmers for agricultural activities is still insufficient. Given that all agricultural institutions in our country utilise social media, it is crucial for farmer organisations and associated institutions to conduct informative activities promoting the efficient use of social media in rural areas for agricultural purposes. In addition, social media platforms providing content for farmers should be mindful of the literacy levels of rural communities, and restrictions on advertising on such sites are also recommended. Developing simplified and farmer-friendly tools and technologies can make it easier for farmers to navigate social media platforms. This could include user-friendly apps or online platforms designed specifically for farmers, which simplify the process of creating and sharing content. Public institutions in particular should use their social media accounts actively and in a way that farmers can understand. While social media provides a conduit for knowledge exchange, more research needs to be undertaken to show the effect these exchanges have for farmer learning and on-farm management practices.

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The Declaration of Conflict of Interest

The authors declare that there are no competing financial and non-financial interest.

The Declaration of Ethics Committee Approval

Ethics committee approval for the study was obtained with the approval of Mardin Artuklu University on 16.05.2021/12929.

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