

A Study on Farmers Awareness and Attitude towards Agri-Mobile Apps in the Rayalaseema Region

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Abstract:

Agriculture, being the cornerstone of food production, is critical to life's survival. In 2015, India established the Digital India and smart agricultural systems to capitalize on the promise of digital technology. Since then, Information and Communication Technology (ICT) has advanced significantly in the agricultural sector, resulting in the establishment of a wide range of services and Applications that serve farmers. Farmers may use these agricultural smartphone applications to learn about new crop types, inputs including seeds, fertilizers, and machinery, market pricing, weather forecasts, pest and disease control, transitioning from chemical to organic farming, crop diagnostics, and best farming practices. Furthermore, these apps allow farmers to communicate with agricultural experts and seek their advice. Farmers can increase agricultural yields by utilizing these applications. However, according to a recent research study done in eight districts of the Rayalaseema area, farmers often lack awareness and expertise regarding the use of agri-mobile applications due to poor guidance and inadequate information transmission. Farmers, on the other hand, are enthusiastic about adopting these applications. Therefore, it is critical to offer the agricultural community with fast and cheap internet access in order to maximize the potential of agri-mobile apps and boost production.

Keywords: Agriculture, ICT, Farmers, Agri Mobile Apps, Awareness, Attitude.

1. Introduction

With the launch of Digital India and the smart agriculture system in 2015, Information Communication Technology has developed significantly in the agriculture sector. The developments in Information Communication Technology have triggered emerging of various agri-mobile apps in India (Sushanta Sarkar et al⁵,2021).The latest agricultural apps for farmers in India are Krish-e, IFFCO-Kishan Agriculture, Pusa Krishi, Agriapp, Crop Insurance, Kheti badi, Agri-Market, Shetkari, Kishan Suvidha etc. The best agricultural apps for farmers in Andhra Pradesh are Naagali, Plantix, IFFCO-Kishan, Vyavasayam, Agricentral etc.(Neeta Raj Sharma et al⁶,2020).

These agricultural mobile apps give farmers access to useful information about farming, including land preparation, seed treatment, crop planning, crop sowing, fertiliser management, pest and disease management, crop diagnosis, and weed treatment, as well as market prices, details about new crop varieties, harvesting, storage techniques, crop insurance, and information about transitioning from chemical farming to organic farming (Dr Thippeswamy, G et al⁴,2018). Moreover, farming apps are the most convenient in providing information in the regional language to guide farmers in farming. Farmers receive instructions on how to do farming in a proper, scientific manner. Farmers may simply resolve any issues relating to pest and insect attacks on their crops. As a result, a farming app aids farmers in increasing their output without spending money, but downloading it from the Google Play store requires an online connection (Dharmendra Singh et al²¹, 2022). However, the majority of the farmers are farming their agriculture using their traditional methods as the farmers are unaware of smart farming methods to obtain high productivity using mobile apps mainly in the Rayalaseema region. Despite the majority of the farmers using smart mobile phones, they don't know the use of Agri – mobile apps due to a lack of guidance and poor dissemination of information on various agricultural apps (S.Nandhini et al²², 2022). Moreover, it is rather difficult for rural farmers to maintain the cost of recharge of required data

to access the various agri-mobile apps according to the analysis of data. Therefore, the Government and private sector need to widely advertise the significance of mobile apps and foster farmers to switch to smart farming methods to gain a high yield with the use of Agri – mobile apps to cultivate various crops effectively (Mittal, S et al¹¹,2010). In addition, farmers need to be educated significantly with the help of extension workers appointed by the agricultural department of the state to create awareness on agri – mobile applications among farmers mainly in Rayalaseema, because, the farmer is the king who quenches starvation of the people Dharmender Singh et al²¹2023.

2. Literature Review

The literature survey focuses on understanding the existing level of awareness among farmers regarding agri-mobile apps. It should also examine the factors influencing their attitudes towards adopting such technology, including perceived benefits and barriers. Additionally, the survey should explore the impact of agri-mobile apps on farming practices and productivity, drawing on case studies and previous research findings.

Dr D.K. Sharma ,Sunidhi Sharma and Supriti Sharma⁷ (2018), In the study, the authors concentrated on a summary of mobile applications for the agricultural sector that are available right now in the Google Play Store for Android devices. Additionally, Kissan Sevak, an Android application that offers a solution to the stated issue, is built and presented. It is also explained what the applications' scope is and what changes need to be done to enable them to appeal to a wider audience.

Anitha, L and Dr Thippeswamy, G ⁴(2018), According to their survey, developers are continuing to release apps that are practical, user-friendly, and simple to use, and this trend in agriculture apps' productivity and potential future applications are being met.

S.Aravindh Kumar and C. Karthikeyan¹ (2019), In their study, The authors aimed to examine the situation of mobile agricultural applications in the global mobile ecosystem, which are accessible on various platforms. They also sought to highlight the difficulties associated with scaling up the mobile agricultural apps and to identify some additional context that could be used to strengthen them.

Neeta Raj Sharma, Shashi Sharma and Deepansh Sharma⁶(2020), In their study, the authors sought to examine the current worldwide situation regarding the accessibility and utilisation of mobile applications in the agriculture industry in various industrialised nations and to evaluate the accessibility and usage of this tool for India's farming community. Exploratory research was done in the Punjabi village of Phagwara in northern India as an add-on to the evaluation to determine the development and adoption of technology of mobile applications. The agricultural industry's mobile applications were assessed based on its accessibility, quantity of downloads, user reviews and comments. B. Jaswanth Naik, P. Rambabu, B. Mukunda Rao, and M. Sree Rekha³ (2020), The majority of the farmers in their study, which concentrated primarily on farmers in the Anantapur region of Andhra Pradesh have a moderate attitude towards ICT tools, according to research on farmer attitudes towards ICT tools. Sushanta Sarkar, Sanjay Kumar and Birendra Kumar⁵ (2021) noted that many apps are used for various types of functionality related to farming activities, such as information on agricultural practices, pesticides, fertilizers, seeds, selling of products, irrigation, estimating crop output, weather, and information on new technology, dealers, and markets. Additionally, this was highlighted in their paper, Mobile Applications for Indian Agriculture and Allied Sector: An Extended Arm for Farmers. S.Nandhini,A.Rohini²² (2022), a study was carried out to find the farmers perception on uzhavan app which is developed by Government of Tamil Nadu and more than 5 lakh farmers have registered in this app and get various benefits.

Dharmender Singh., P., S., Shehrawat., J., S., Malik., Dangi, Pooja, Arun., Dr.D., Sasi, Kumar²¹ (2023), a study aimed to determine how agricultural mobile apps were used by farmers for agricultural productivity by using a utility index, and the results showed that more than half of the respondents perceived medium level of utilization pattern of agriculture mobile apps on agricultural practices.

2.1 Objectives For The Study

1. To study the level of awareness among farmers towards agri-mobile apps in the Rayalaseema region.

2. To find out farmers' knowledge of using agri-mobile apps.
3. To study the attitude of farmers in the Rayalaseema region about agri mobile apps.

2.1.1 Scope Of The Study

Information and communication technology (ICT) in agriculture is essential for rural households that rely on agriculture as their major source of income to improve their economies. Therefore, this study predominantly focused on farmers' awareness and attitude towards agri-mobile apps. Both primary and secondary data were used to create this study. The structured questionnaire was used to gather the main data. Suggestions given based on data analysis provide an important insight into farmers' awareness and attitude towards agri mobile apps in 8 districts of the Rayalaseema region. The suggestions offered help the Government and private sectors to take appropriate measures about awareness and attitude of farmers towards agri mobile apps to switch to smart farming methods can be helpful to the farmers to get high productivity.

2.1.2 Need For The Study

The study is very significant because the majority of the farmers in 8 districts of the Rayalaseema region depend on agriculture. Farmers rely primarily on agriculture for their living. The farmers are endeavoring to yield a good crop with conventional varieties. After the agriculture industry adopted ICT (information and communication technology), information related to agriculture is provided to the farming community through mobile applications to enhance their productivity. Therefore, it is paramount to know the farmers' awareness and attitude towards agri-mobile apps, especially in the Rayalaseema region.

3. Methodology

The Rayalaseema region, one of Andhra Pradesh's most significant regions, is where the study was carried out. The study is primarily based on primary data and is descriptive. The major tool for gathering the primary data is the structured questionnaire method. The data about the education level of farmers of a specific region, level of awareness of farmers, source of awareness of various Agri mobile apps and information of farming of various crops and fertilizers, knowledge of farmers in using and attitude of farmers towards Agri mobile apps are collected through the structured questionnaire. The necessary secondary data is gathered through publications like books, journals, newspapers, and websites. The convenience sampling method for the study is used to collect the relevant data with a sample size of 600 from 8 districts of the Rayalaseema region. From each district, 75 farmers have been selected to collect data based on the information given by the Agricultural Extension Officers from all the districts of the Rayalaseema region. Qualitative and Quantitative data are analyzed using SPSS statistical tools.

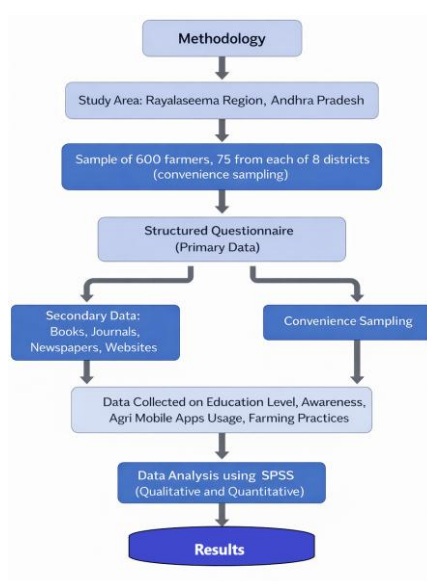


Figure 1: Research methodology

4. Results

The purpose of the data analysis is to present and explain the results of the study on the awareness and attitudes of farmers in the Rayalaseema region regarding agri-mobile apps. The study combines quantitative and qualitative information gathered from structured questionnaire. Farmers' awareness levels, the factors impacting their use of apps, and their attitudes toward implementing technology for agricultural purposes are all thoroughly examined by the statistical analysis, using SPSS.

Table 1: Education level of farmers in Rayalaseema region.

S.NO	Level of Education	No of farmers	Percentage
1	Primary Education	231	38.5
2	Secondary Education	219	36.5
3	Higher Secondary Education	96	16
4	Higher Education	54	9

From the above table, it is found that the primary education of the farmers in the Rayalaseema region is 38.5%, the secondary education of farmers is 36.5%, the Higher Secondary education of the farmers is 16% and the Higher education of the farmers is 9%. The overall education level of farmers is good in the Rayalaseema region.

Table2: Level of awareness of farmers towards Agri-mobile apps

Level_of_awareness					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	Highly aware	55	9.2	9.2	9.2
	Moderately aware	82	13.7	13.7	22.8
	Not at all aware	339	56.5	56.5	79.3
	Slightly aware	124	20.7	20.7	100.0
	Total	600	100.0	100.0	

Frequency					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	55	55	9.2	9.2	9.2
	82	82	13.7	13.7	22.8
	124	124	20.7	20.7	43.5
	339	339	56.5	56.5	100.0
	Total	600	100.0	100.0	

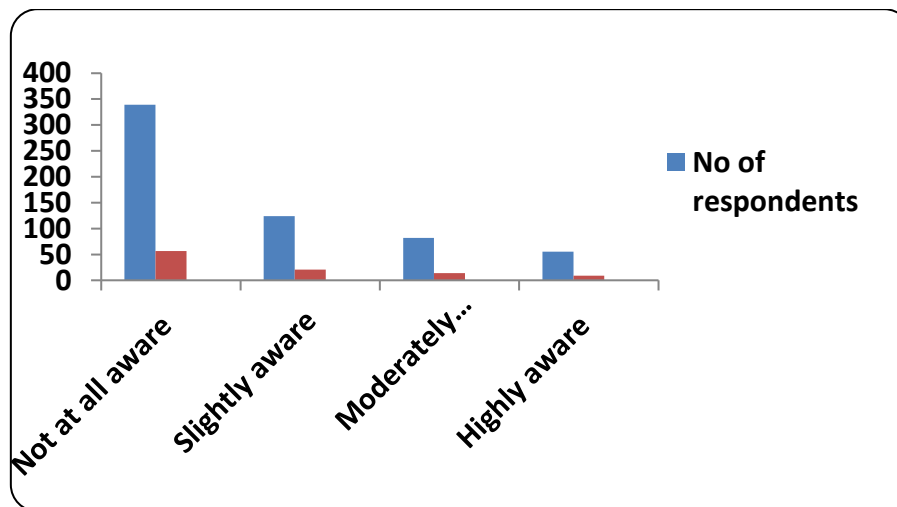


Figure2: Level of awareness of farmers towards Agri-mobile apps

From the above table, it is found that a majority(56.5%) of farmers are not at all aware of agri mobile apps,20.7% of farmers are slightly aware, 13.7% of farmers are moderately aware and 9.2% of farmers are highly aware. It suggests that a smaller proportion of farmers are engaged with the apps or using them effectively. Therefore, the level of awareness of farmers towards Agri-mobile apps in the Rayalaseema region is poor.

TABLE 3: Source of awareness of various Agricultural mobile apps

Source_of_awareness					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	DEALERS	205	34.2	34.2	34.2
	EXTENSION WORKERS	90	15.0	15.0	49.2
	FELLOW FARMERS	125	20.8	20.8	70.0
	NEWSPAPER	42	7.0	7.0	77.0
	SOCIAL MEDIA	68	11.3	11.3	88.3
	TV	70	11.7	11.7	100.0
	Total	600	100.0	100.0	

No_of_farmers					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	42	42	7.0	7.0	7.0
	68	68	11.3	11.3	18.3
	70	70	11.7	11.7	30.0
	90	90	15.0	15.0	45.0

	125	125	20.8	20.8	65.8
	205	205	34.2	34.2	100.0
	Total	600	100.0	100.0	

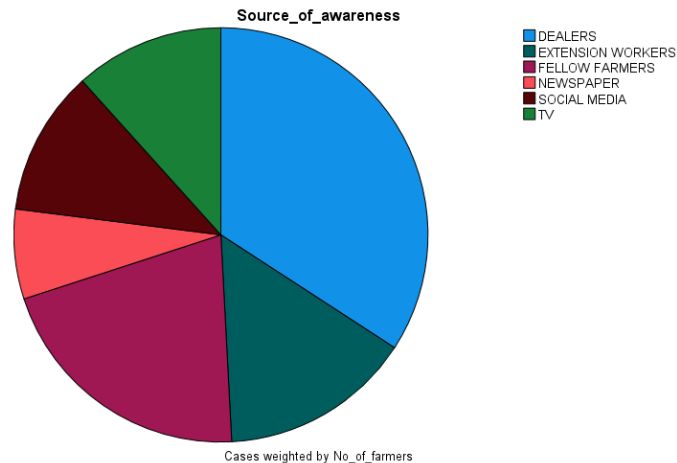


Figure3: Source of Awareness of Agri - Mobile Apps for Farmers

The above table indicates that 34.2% of farmers said that their main source of awareness and information are from dealers, 20.8% of farmers said that their source of awareness is from fellow farmers, and 15% of farmer said that their source of awareness is from extension workers. However, the majority of the farmers obtain the information from dealers only. Therefore, dealers are a significant outlier, as they have a large number of farmers compared to the other sources.

Table 4: Knowledge of farmers in the use of Agri- mobile apps.

Knowledge_level					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	Average	123	20.5	20.5	20.5
	Good	89	14.8	14.8	35.3
	No knowledge	336	56.0	56.0	91.3
	Very Good	52	8.7	8.7	100.0
	Total	600	100.0	100.0	

Number_of_farmers					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	52	52	8.7	8.7	8.7
	89	89	14.8	14.8	23.5
	123	123	20.5	20.5	44.0

	336	336	56.0	56.0	100.0
	Total	600	100.0	100.0	

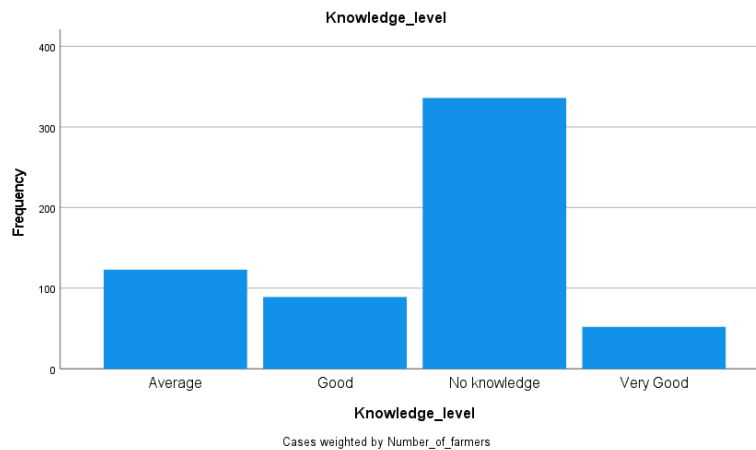


Figure 4: Farmers frequency

The above data indicates that most farmers (56%) of farmers said that they have no knowledge of Agri –mobile apps, 20.5% of farmers are average, 14.83% of formers are good and 8.7% of farmers are very good in the use of Agri mobile apps. This suggests that there is a significant lack of knowledge of farmers in the use of agricultural mobile apps.

Table 5: Number of farmers using Agri-mobile apps

App usage					
		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	High	53	8.8	8.8	8.8
	Low	116	19.3	19.3	28.2
	Moderate	82	13.7	13.7	41.8
	Not at all	349	58.2	58.2	100.0
	Total	600	100.0	100.0	

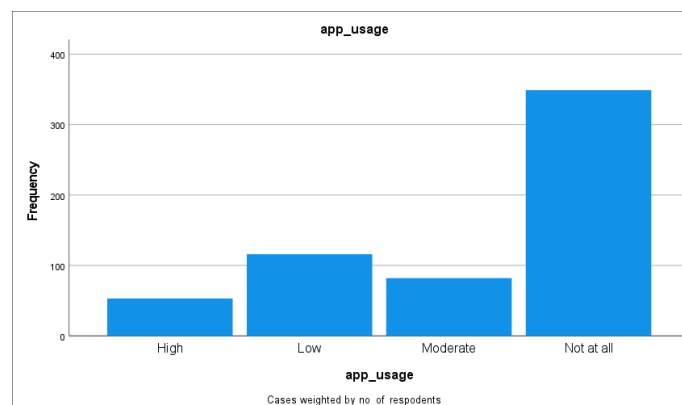


Figure 5: Number of Farmers using Agri-Mobile Apps

From the above table, it is inferred that the majority of farmers (58.2%) said that they are not all using, 19.33% of farmers are using low, 13.66% of farmers are using moderate, and 8.84% of farmers are using high. This suggests that a substantial portion of farmers remains completely disengaged from its usage.

Table 6: Number of Users for Various Agri-mobile Apps

App_name		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	Agricentral	7	17.5	17.5	17.5
	IFFCO Kisan	9	20.7	20.7	38.2
	Naagali	6	14.3	14.3	52.6
	Plantix	13	30.7	30.7	83.3
	Vyavasayam	7	16.7	16.7	100.0
	Total	42	100.0	100.0	

Number of users		Frequency	Percent	Valid Percent	Cumulative Percentage
Valid	36	6	14.3	14.3	14.3
	42	7	16.7	16.7	31.1
	44	7	17.5	17.5	48.6
	52	9	20.7	20.7	69.3
	77	13	30.7	30.7	100.0
	Total	42	100.0	100.0	

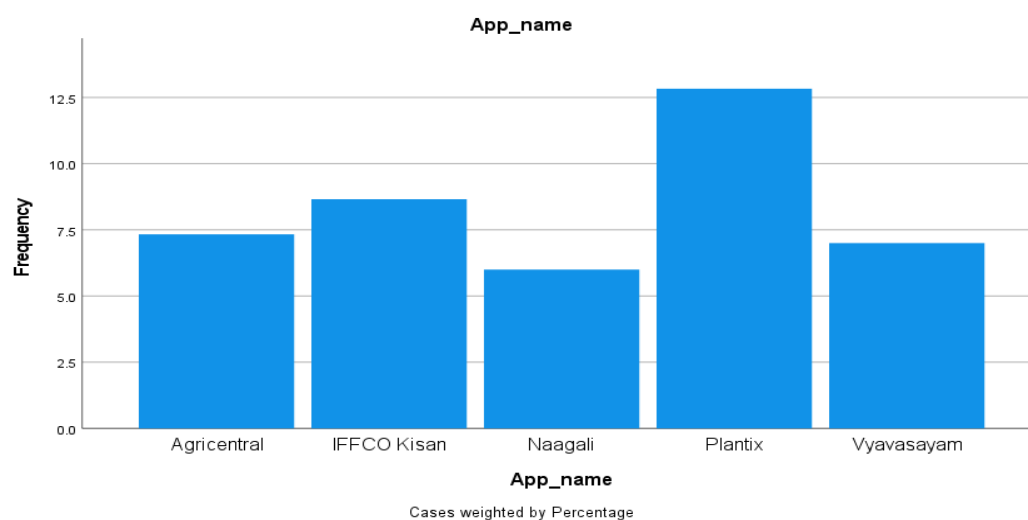


Figure 6: Users for Various Agri-mobile Apps

The analysis shows that 30.7% of farmers are using Plantix, 20.71% of farmers are using IFFCO Kissan, 17.53% of farmers are using Agricentral, 16.73% of farmers are using Vyavasayam, and 14.34% of farmers are using Naagali. However, the majority of the farmers are using Plantix agri-mobile app in the Rayalaseema region. This suggests that Plantix is the most used app among the options. The other apps contribute smaller portions.

Table 7: Analysis of the attitude of farmers towards Agri-mobile apps

S.No	Statements	SA		A		UD		DA		SDA		St.Dev
		F	%	F	%	F	%	F	%	F	%	
1	Mobile apps for agriculture can offer accurate and necessary information.	97	38.64	142	56.57	3	1.19	5	1.99	4	1.59	58.35
2	Agri mobile apps can provide practical-oriented information	102	40.63	130	51.79	5	1.99	8	3.18	6	2.39	54.46
3	Agri mobile apps help to inform about agriculture effectively	106	42.23	114	45.41	9	3.58	12	4.78	10	3.98	48.90
4	It is easy to form agriculture using Agri mobile apps	71	28.28	147	58.56	14	5.57	12	4.78	7	2.78	53.74
5	Agri smartphone apps are challenging for rural people to understand and use.	91	36.25	63	25.09	11	4.38	57	22.70	29	11.55	27.79
6	Farmers can cultivate better crops with the help of mobile applications	89	35.45	123	49.00	9	3.58	18	7.17	12	4.78	46.90
7	Using mobile apps, farmers can work more effectively.	62	24.70	150	59.76	12	4.78	14	5.57	13	5.17	53.40
8	Agri-mobile apps help farmers in identifying crop diseases and	83	33.06	128	50.99	5	1.99	20	7.96	15	5.97	47.59

	controlling											
9	Lack of mobile network connectivity in rural areas	66	26.29	79	31.47	10	3.98	59	23.50	37	14.74	24.28
10	Agri mobile apps are really useful to farmers to get knowledge of Various methods of farming different crops.	65	25.89	89	35.45	11	4.38	49	19.52	37	14.74	26.22
11	It is difficult to maintain the cost of recharge of required internet data to access the various Agri mobile apps.	76	30.27	102	40.63	6	2.39	44	17.52	23	9.16	34.87
12	Agri mobile apps can provide information very quickly	91	36.25	113	45.01	10	3.98	21	8.36	16	6.37	43.00
13	Agri-mobile apps can enable farmers less dependency	89	35.45	115	45.81	14	5.57	19	7.56	14	5.57	43.12

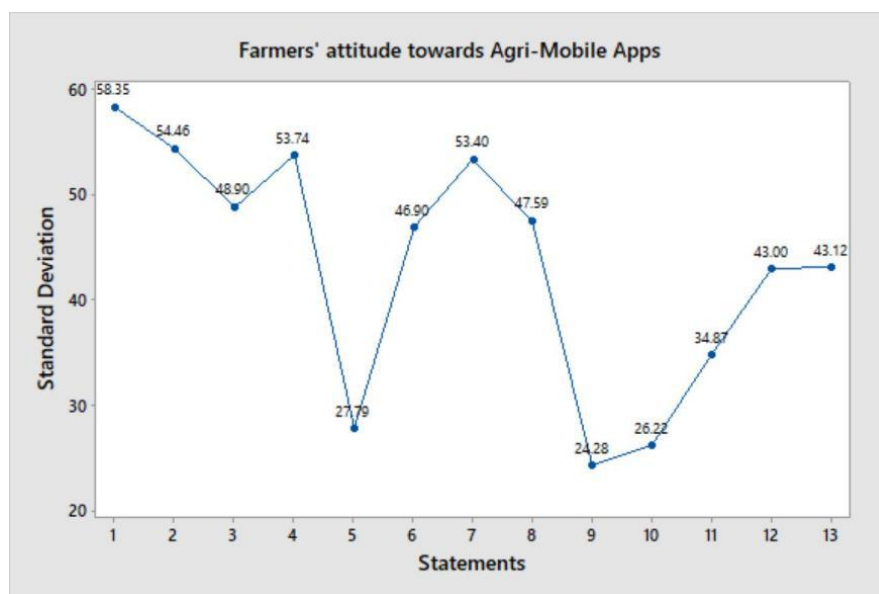


Figure 7: Graphical representation of Formers 'attitude towards Agri-Mobile Apps.

Based on the data, about 251 out of 600 farmers are using agri-mobile apps in 8 districts of the Rayalaseema Region. Hence, the analysis of the attitude of farmers towards agri-mobile apps solely from 251 farmers has been made. While studying the attitude of farmers towards agri-mobile apps, the study found that nearly 95% of farmers agreed that agri-mobile apps can provide accurate and necessary information. About 92% of farmers perceived that agri-mobile apps can provide practical-oriented information. 87.64% of farmers agreed that it is easy to farm agriculture using agri-mobile apps. Most of the farmers agreed that by using agri-mobile apps, farmers can work more effectively. Over 42% of farmers strongly agreed and 45.41% of farmers agreed that agri-mobile apps help in farming agriculture effectively.

Over 84% of farmers agreed that agri-mobile apps help farmers in identifying crop diseases and controlling quickly. More farmers agreed that farmers can cultivate better crops with the help of mobile applications. About 81% of farmers agreed that agri-mobile apps enable farmers less dependency. Most of the farmers agreed that agri-mobile apps provide information very quickly as soon as doubt is raised by the farmers through mobile apps. Besides, more farmers strongly agreed that they are getting knowledge of various methods of farming different crops using agri-mobile apps. 70.90% of farmers agreed that it is difficult to maintain the cost of recharge of required internet data to access various agri-mobile apps. 61.39% of farmers agreed that it is difficult for rural people to understand and use agri-mobile apps without guidance. Moreover, 57.76% of farmers agreed that there is a lack of mobile internet connectivity in rural areas due to poor networks. However, the majority of the farmers' attitude is positive towards agri-mobile apps in Rayalaseema Region as the importance of technology increases significantly.

Table 8: Problems faced by the farmers using Agri-mobile apps

S.No	Problems	Least Severe		Not so Severe		Severe		Very Severe		St.Dev	Rank
		F	%	F	%	F	%	F	%	%	
1	The dearth of knowledge and skills	17	6.77	10	3.98	126	50.19	98	39.04	50.29	2
2	Lack of guidance	14	5.57	09	3.58	127	50.59	101	40.23	52.10	1
3	Low internet speed	41	16.33	62	24.70	86	34.26	62	24.70	15.93	5
4	Poor network	36	14.34	41	16.33	102	40.63	72	28.68	26.53	4
5	High cost of mobile recharge	52	20.71	61	24.30	73	29.08	65	25.89	7.56	6
6	Difficult to understand the obtained information	27	10.75	42	16.73	104	41.43	78	31.07	30.18	3

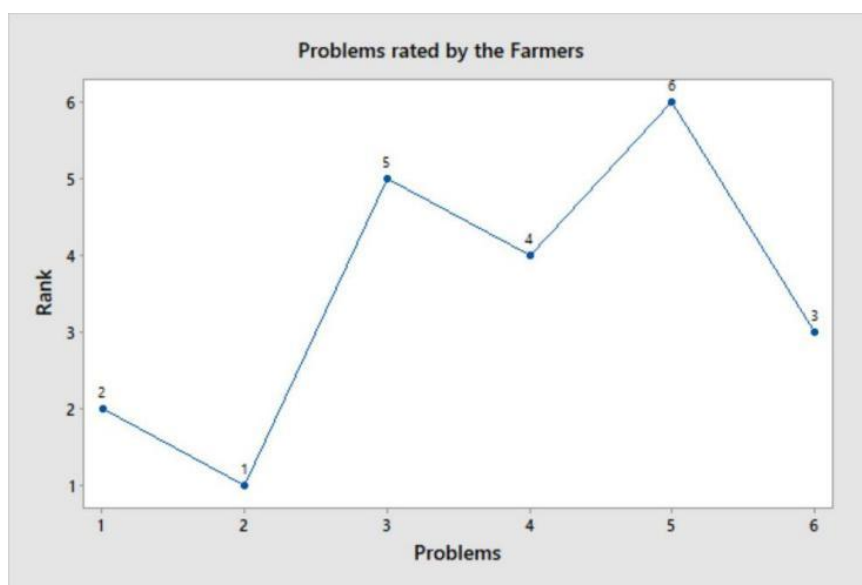


Figure 8: Graphical representation of Problems rated by the farmers

From the above graph, it is inferred that lack of guidance is the primary concern for the farmers to use Agri-mobile apps. A dearth of knowledge and skills is the next problem for the farmers. The majority of farmers also thought that it is difficult to understand the obtained information. Other issues for farmers are Poor network, low internet speed and expensive mobile recharge rates while using the mobile app. The study concentrated on the different problems of the farmers in the Rayalaseema Region.

4.1 Discussions

The study offers insightful information about the awareness, understanding, and attitudes of farmers in the Rayalaseema region regarding agri-mobile apps. The results highlight critical gaps in technology adoption within the agricultural sector to improve the efficiency of agri-mobile apps in empowering farmers.

The results show that even though most farmers own cellphones, they are still mostly unaware of agri-mobile applications. This implies that simply having access to technology does not guarantee that it will be used effectively in agriculture. For agricultural information, the majority of farmers rely on conventional sources like dealers, which suggests a knowledge gap regarding mobile-based agricultural solutions. Additionally, farmers have little experience with these apps, which can be ascribed to a number of issues like inadequate training, low levels of digital literacy, and a lack of marketing initiatives. These findings are consistent with earlier research that demonstrated how information availability and digital literacy have a major impact on the adoption of technology in agriculture.

Farmers have a generally good attitude toward agri-mobile apps, notwithstanding their lack of awareness and knowledge. This shows that if given the right direction and tools, farmers are willing to embrace new technologies. The need for focused awareness campaigns and instructional programs catered to the unique requirements of these farmers is shown by the persistent attitude in some parts of the Rayalaseema region.

According to the survey, one of the main obstacles to the uptake of agri-mobile apps is a lack of instruction. This research emphasizes how crucial it is for legislators, app developers, and agricultural extension agents to collaborate in order to produce user-friendly applications and give farmers the necessary training. To increase adoption rates, it may also be necessary to overcome issues including language difficulties, complicated interfaces, and a lack of local support. The involvement of agricultural extension officers in this study plays a critical role in identifying farmers for the survey. Their role need to be expanded to include training farmers on the use of agri-mobile apps, raising awareness about their benefits, and addressing concerns related to their use. By including these officials in digital literacy initiatives, the gap between end users and app developers may be lessened.

4.1.1 Opportunities for Improvement

To increase the adoption and effective use of agri-mobile apps, several measures can be recommended:

- **Training Programs:** Regular workshops and hands-on training sessions for farmers on how to use agri-mobile apps can improve digital literacy.
- **Collaborations:** Partnerships between app developers, government agencies, and local agricultural institutions can create a robust ecosystem for digital agriculture.
- **Simplified User Interfaces:** Apps should be designed to be intuitive and easy to use, considering the varying levels of digital literacy among farmers.

5. Conclusions

This study emphasizes the importance of awareness campaigns, digital literacy programs, and farmer-centric app development to bridge the gap between farmers and agri-mobile technology. Though the attitude of farmers toward these apps is positive, efforts must be intensified to address barriers such as lack of guidance and poor knowledge. Moreover, agri mobile apps help farmers produce better crops, which boost their income and improve their standard of living. However, in this survey, the most of the farmers in 8 districts of the Rayalaseema region, are unaware of the use of agri- mobile apps in cultivating various crops to enhance farm income and production effectively. However, there are challenges like poor awareness of the use of mobile apps and the latest technology of agriculture, poor internet connectivity, low digital literacy, lower adoption, lack of advisers to farmers about the farming of various crops using agricultural mobile apps, feeling of burden to maintain a smartphone with the required data to access the various agri-mobile apps etc. In the future, agricultural mobile apps will be essential for providing the farming community with services including information of market, weather updates, monitoring of plant health, and knowledge about agriculture. The information helps the farming community to practise new methods of farming and also improve agricultural production.

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