

MOBILE PHONE USAGE AMONG THE RICE FARMERS FOR CROP MANAGEMENT PRACTICES IN IMPHAL WEST DISTRICT OF MANIPUR

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ABSTRACT

Mobile phones have played a crucial role in improving farmers' decision-making process, fostering social cohesion and strengthening relationships within farming communities. This study, conducted in May 2023 with 150 respondents from Imphal West district, Manipur, examined the socio-economic profiles of farmers, their farming practices and the adoption of mobile technology in rice crop management. The findings indicated that 49.30% of respondents were aged over 47 years, with more than 21 years of farming experience. Smartphone usage (69.00%) was significantly higher than keypad phones, with a strong preference for communication in the local Manipuri dialect. However, the study revealed that farmers spent minimal time using mobile phones for agricultural purposes, with the majority primarily using them for entertainment. Regarding mobile phone utilization in rice crop management, 55.00% of respondents regularly accessed information related to marketing activities, while 47.00% sought details on seed treatment. Educational qualifications had a statistically significant influence on key farming practices such as seed management and marketing ($p < 0.01$). Among institutional sources, 49.00% of respondents frequently obtained agricultural information from Krishi Vigyan Kendra (KVK) in the district. The results further highlight statistically significant differences (denoted by ** at the 1% level) between educational qualifications and the adoption of agricultural apps. These findings underscore the need for targeted interventions to enhance farmers' awareness and capacity to utilize mobile technology effectively for agricultural decision-making and productivity improvement.

Keywords: Agri apps, Agricultural information, Educational influence, Farmers decision making, Mobile phone, Rice crop management

INTRODUCTION

Mobile phones have been instrumental in enhancing the knowledge of farmers and promoting rural development in developing nations. A revolution in agricultural development has been initiated by the

application of mobile devices in agriculture and related sectors (Kumar *et al.*, 2023). A multitude of mobile applications have been developed with the intention of providing farmers with useful information. These applications function as a medium through

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which timely data is transmitted, encompassing topics such as cropping patterns, weather forecasts, exotic and indigenous breeds, feeding management, and government initiatives supporting agriculture and related sectors (Panda *et al.*, 2019). Increased social cohesion and enhanced social relations between the business community and farmers resulted from the use of mobile phones (Kumar, 2023). By optimizing mobile phone usage; producers will gain access to pertinent agricultural information (Athirah *et al.*, 2020). According to Aker and Ksoll (2016), the mobile applications facilitate the dissemination of vital information regarding crops and management requirements.

In north eastern India, Manipur is heavily dependent on rice cultivation, with 90% of its Gross cropped area (GCA) dedicated to paddy farming (Singha and Mishra, 2015). Furthermore, 80% of the state's total population is engaged in agriculture and allied sectors (Roy *et al.*, 2018), underscoring the significance of the agricultural economy, particularly paddy farming in the region. In Manipur, where rice is a staple crop and agriculture is the backbone of the economy, farmers face numerous challenges, and financial constraints. To address these challenges, initiatives in information technology have been introduced to support farming and improve farmers' welfare. Notably, since 2020, the Central Agricultural University, Imphal, launched a mobile-based agro-advisory system in Manipur. This system enables farmers to access or receive crucial agricultural information, thereby improving decision-making, productivity, and livelihoods (Dipak Nath *et al.*, 2022). While mobile phones offer a promising solution to bridge the gap between farmers and essential agricultural resources, their adoption in agriculture is influenced by factors such as digital literacy, accessibility, affordability and reliable network availability.

In Imphal West district, where a large population relies on rice cultivation, understanding the impact of mobile phone usage on rice crop management is critical. This research investigates how mobile phones have influenced farming practices, facilitated knowledge dissemination, and improved decision-making among rice farmers in the region. It also examines the challenges, farmers face in adopting mobile technology and explores opportunities for enhancing its use in agriculture. By analysing the role of mobile phones in rice crop management, this study aims to provide actionable insights into leveraging technology to address the limitations of traditional farming practices, enhance livelihoods, and promote sustainable agricultural development in Manipur.

MATERIAL AND METHODS

The present study was undertaken with the objective of assessing the extent of mobile phone utilization in rice crop management in Imphal West district of Manipur. The study was carried out over a period of three months, from 2nd March to 29th May, 2023. A total sample of 150 respondents (Paddy farmers) were selected using a simple random sampling technique from three purposively selected villages, namely Wangoi, Leiphprakpam and Phoubakchao, located under Wangoi block of Imphal West District. From each village, fifty farmers who were actively using mobile phones in their farming practices were included in the study. Wangoi block was selected purposively due to its significant contribution to rice cultivation, prominence in agricultural activities and similar in landholding patterns among farmers. The data were collected through face to face interviews using a structured interview schedule. A three-point rating scale was employed to measure the extent of mobile phone utilization, with response categories of regular, occasional,

Table 1. Socio-economic profile and demographic profile of the respondents**(n=150)**

Sl. No.	Category	Frequency	Percentage
1	Age		
	18-25 years	9	6.00
	26-36 years	26	17.30
	37-46 years old	41	27.30
	> 47 years	74	49.30
2	Gender		
	Male	100	67.00
	Female	50	33.30
3	Marital status		
	Married	110	73.30
	Unmarried	40	27.00
4	Educational status		
	Illiterate	36	24.00
	Literate High school	47	31.30
	Higher secondary	20	13.30
	Graduate	12	8.00
5	Nature of occupation		
	Farming as a sole profession	96	64.00
	Farming and business	35	23.30
	Farming and service	19	13.00
6	Annual income		
	Less than Rs1,00,000	57	38.00
	Between Rs 1,00,000-Rs 2,00,000	77	51.30
	Above Rs 2,00,000	16	11.00
7	Land holding pattern		
	Owned	96	64.00
	Leased in (rent)	54	36.00
8	Size of land holding		
	Less than 1 hectare (marginal farmers)	97	65.00
	1 to 2 hectare (small marginal)	40	27.00
	2 to 3 hectare (semi marginal)	13	7.00
9	Years' of experience in agriculture		
	Up to 10	21	14.00
	11 to 20	39	26.00
	>21	90	60.00
10	Contact with agriculture extension agent		
	Rarely	65	43.30
	Once in a month	32	21.30
	Twice in a month	30	20.00
	Every week or more	23	15.00

and rare, assigned scores of 1, 2, and 3, respectively. The collected data were tabulated and analyzed using appropriate statistical tools such as frequency, percentage, mean, and standard deviation to derive meaningful interpretations and present the findings systematically.

The mean scores and standard deviations provide insights into the central tendency and variability of responses across different aspects of agricultural practices. The f-value, derived from an analysis of variance (ANOVA) test, assesses the statistical significance of differences in means among educational qualification groups. The associated p-values (not explicitly provided in the table but typically associated with the f-value) help determine the significance of these differences.

RESULTS AND DISCUSSION

As depicted in Table-1, provides a comprehensive study on age, gender, marital status, education qualification and annual income. The study shows that the majority of respondents 49.3 per cent are above 47 years, highlighting their extensive farming experience and reliance on agriculture as a livelihood. Young farmers (18-25 years) constitute only 6 per cent, as many youths leave rural areas for education and urban employment, a trend supported by similar studies. Males dominate farming activities, accounting for 67 per cent of the respondents, while females constitute 33 per cent. This aligns with Nweke (1980) research indicating men typically engage in more labor-intensive agricultural tasks, whereas women focus on lighter roles such as planting and weeding. Regarding educational level the findings reveal low literacy levels, with 24 per cent of respondents being illiterate, 31 per cent completing high school, and only 8 per cent attaining graduate degrees. Considering overall annual income, over half 51 per cent

of the respondents have annual incomes ranging from Rs.1,00,000 to Rs. 2,00,000, while only 11 per cent earn above 1 2,00,000. Limited income is linked to small landholdings, as the majority are marginal farmers owning less than 1 hectare of land. Interaction with agriculture extension agents varies, with 43.3 per cent having rare contact with the extension expert; however, 21.3 percent have contact with the extension expert in once a month, followed by 20 per cent have contact in twice a month, and 15 per cent have contact in every week or more within a month.

Table 2 presents details regarding the use of mobile phones in the context of rice crop management. The majority 69 per cent of respondents prefer smart phones or android devices over keypad phones 31.3 per cent, however daily mobile phone usage among respondents is predominantly limited, with 31 percent spending more than 1 to 2 hours daily, primarily use mobile phone for specific tasks related to general communication, and farm related information. They prioritize their time on essential activities in the field and limit non-essential phone use to maximize productivity. Language preferences reveal a preference for the Manipuri language 55 per cent over Hindi and English, facilitating easier understanding of the phone application through local context. About 67 per cent of respondents have internet/data subscriptions, aligning with findings from Chhachhar *et al.* (2014), while 84.7% of respondents used internet on mobile phones for entertainment and other things. Airtel is the preferred network service provider for 42 per cent of respondents, due to the network convenience and past experience followed by Jio (32%) and BSNL (26%), with 100 per cent favoring prepaid plans due to expense control.

Table 3 analyzes respondents' utilization of mobile phones for different

Table 2. Usage pattern of mobile phone among farmers

(n=150)			
Sl. No	Details	Frequency	Percentage
1	Category of mobile phone use		
	Keypad	47	31.30
	Smart phone/Android	103	69.00
2	Duration of holding mobile phone		
	>3 year	32	21.30
	3 to 6 years	40	27.00
	<6 years	78	52.00
3	Duration of time spent on mobile phone/day		
	>1 hour	39	26.00
	>1-2 hour	47	31.30
	>3-4 hour	38	25.30
	More than 4 hours	26	17.30
4	Language preferences		
	English	28	19.00
	Hindi	40	27.00
	Manipuri	82	55.00
5	Subscribe to a mobile data/internet		
	Subscribed	100	67.00
	Not subscribed	50	33.30
6	Subscriptions to mobile network service providers		
	Airtel only	63	42.00
	Jio only	48	32.00
	BSNL (Bharat Sanchar Nigam Limited)	39	26.00
7	Preference of mobile recharge package		
	Pre-paid	150	100.00
	Post-paid	-	-
8	If yes, prepaid mention the recharge pack		
	Monthly	67	47.00
	Weekly	62	41.30
	Yearly	21	14.00

Table 3. Extent use of mobile for rice crop management

(n=150)

SI.No.	Use of mobile phone on aspect of rice crop	Regularly		Occasionally		Rarely	
		F	P	F	P	F	P
1	Field preparation and planting	43	29.00	62	41.30	45	30.00
2	Selection of variety	39	26.00	55	37.00	56	37.30
3	Nutrient management	38	25.30	41	27.30	71	47.30
4	Sowing and transplanting	44	29.30	51	34.00	55	37.00
5	Seed treatment	67	47.00	56	37.30	27	18.00
6	Effective plant protection measures	42	28.00	53	35.30	55	37.00
7	Weed management	26	17.30	35	23.30	89	59.30
8	Irrigation management	42	28.00	62	41.30	46	31.00
9	Harvesting/picking and storing	25	17.00	25	17.00	100	67.00
10	Marketing activities	82	55.00	38	25.30	30	20.00

aspects of rice crop management, categorized as Regularly, Occasionally, and Rarely. The data indicates a general limitation in access to information via mobile phones across all ten aspects of rice crop management. However, it's noteworthy that the majority 47 per cent of respondents seek information on seed treatment, finding it crucial for accessing current guidance on various treatment methods and products. Similarly, approximately 55 per cent of respondents seek information on marketing activities, citing the convenience of staying updated on market prices and negotiating directly with buyers without visiting physical marketplaces. This aligns with findings from Rajneesh and Sisodia (2020), which showed that mobile phone users had higher knowledge levels regarding marketing channels, government-set minimum selling prices, and market prices of rice crop produce compared to non-users. This underscores the value of mobile phones in enhancing farmers' marketing knowledge, as reported by Aker (2016), who highlighted the

role of cell phones in accessing market information. Additionally, respondents rely on traditional knowledge, local farming methods, and community-shared information for certain aspects of rice crop management, indicating a preference for these methods alongside digital alternatives.

The table 4 presents an analysis of the association between educational qualifications and the extent of mobile phone use in a sample of 150 individuals engaged in various agricultural activities. The results indicate that for certain aspects-specifically, field preparation, weed management, irrigation management, harvesting/picking and storing, and marketing activities, there are statistically significant differences based on educational qualifications (denoted by ** at the 1% level). This means that individuals with different educational backgrounds exhibit variations in their approaches to these aspects of agricultural activities, and these differences are highly unlikely to have occurred by chance alone ($p < 0.01$). The p-values associated with

Table 4. Association between educational qualification and usage of mobile phone for various practices

(n=150)					
Sl.No	Aspects	Mean	Std. Deviation	f-value	Significance
1	Field preparation	2.01	.768		
2	Selection of variety	2.11	.790		
3	Sowing and transplanting	1.93	.656		
4	Nutrient management	2.08	.815		
5	Seed treatment	1.77	.787	5.523	.004**
6	Effective plant protection measures	2.09	.806		
7	Weed management	2.42	.771		
8	Irrigation management	2.03	.768		
9	Harvesting/picking and storing	2.50	.766		
10	Marketing activities	1.65	.794		

** significant at 1% level

the f-values are crucial in interpreting the significance of the findings. A p-value of 0.01 (1%) or lower is conventionally considered highly significant in statistical analyses, suggesting a robust association between educational qualifications and the extent of mobile phone use across these specific aspects of agricultural practices which is also similar to the study of Kumar (2023).

The study examined respondents' preferences of sources for obtaining information from agricultural institutional services. Findings revealed that 49 per cent of respondents frequently accessed information from Krishi Vigyan Kendra (KVK) institutions through mobile phone calls and WhatsApp group messages. This was largely because some farmers were registered in farmer groups under the KVK service, enabling them to receive relevant updates and address their queries. Additionally, KVKs provided timely updates on agricultural activities and best practices. Furthermore, 28 percent of

respondents received information from Line Departments such as District Agriculture Offices (DAOs). However, the majority of farmers reported rarely obtained information from Agricultural Technology Information Centers (ATICs), Central Agricultural University (CAU), and private agencies. The primary reasons cited included a lack of awareness about the services offered, uncertainty about how to access information, and difficulties in physically visiting these centres, particularly for those in rural areas.

The table 6 presents association between educational qualifications and the usage of mobile based-Agri apps for rice crop management in a sample of 150 individuals engaged in various agricultural activities. The results indicated that usage of mobile based-Agri apps for rice crop management there are statistically significant differences based on educational qualifications (denoted by ** at the 1% level) in usage of different apps for different purposes.

Table 5. Source of information attained through Institutional services

Sl.No	Sources	(n=150)					
		Regularly		Occasionally		Rarely	
		F	P	F	P	F	P
1	Sources of information						
	Central/ State agriculture universities	36	24.00	22	8.00	92	61.30
	Line departments	42	28.00	56	37.30	52	35.00
	ATICs (Agricultural Technology Information Centre)	21	14.00	43	27.00	86	57.30
	KrishiVigyan Kendra (KVKs)	73	49.00	46	31.00	31	21.00
	Private agencies/NGO	23	15.30	7	4.60	120	80.00

Table 6. Association between educational qualification and usage of mobile based-Agri apps for rice crop management

Aspects	Mean	Std. Deviation	f-value	.sig
Use of mobile-based apps used by farmers				
m4agri apps (local)	2.36	0.76		
Krishi jigran	2.58	0.69		
Agri apps	2.22	0.81		
Kisan Suvidha	2.57	0.72		
Reason for using Agri mobile apps			7.589	.002**
To check weather condition for planting time	2.15	0.81		
To improve the quality of seedlings	2.38	0.74		
To track down what actually happens on the farm	2.62	0.63		
To know how to treat pests	2.28	0.77		
Prevention of weed growth	2.57	0.74		
To clarify the doubt to the community	2.19	0.80		
To describe the problem with the expert	2.54	0.73		
To know current market prices for proper profit margin	2.21	0.83		

** significant at 1% level

CONCLUSION

The study revealed that while 69% of respondents prefer smartphones, their usage for rice crop management remains limited.

Regarding mobile usage for different aspects of rice crop management, 55% of respondents regularly sought marketing information. Educational status significantly influenced key farming practices, including field preparation,

weed management, irrigation, harvesting, and marketing activities ($p < 0.01$). Limited access to institutional services was observed, except KVK (49.00% with regular contact) for information. Furthermore, mobile-based agricultural apps were adopted by only a small group of progressive and business-oriented farmers, while the majority showed minimal engagement. These findings emphasize the need for targeted interventions to enhance digital literacy and mobile technology use in agriculture. These targeted recommendations aim to address existing gaps in mobile technology adoption, empowering farmers to make informed decisions and enhance rice crop management efficiency.

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