

CONSTRAINTS TOWARDS USE OF ICT TOOLS IN AGRICULTURE BY FARMERS IN NAGALAND

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ABSTRACT

Information and Communication Technology (ICT) refers to devices, services and applications which help to disseminate information with the help of technology. ICTs essentially make it easier to create, manage, store, retrieve, and disseminate any relevant data, knowledge, and information that has already been processed and altered. The data was collected on the month of January to March 2024. A total of 360 respondents were selected from 6 districts. From each district 2 blocks were selected for the current study. Structured interview schedule was prepared and multistage sampling design was applied for the study. Group discussion and personal interview was conducted to find out the constraints faced by farmers in the use of ICT tools and Garrett's Ranking Technique was used to rank the constraints based on the severity from the point of view of respondents. From the study it was found that the major constraint faced by farmer in Nagaland for the use of ICT tools was lack of training of the farmers towards use of different ICT tools (70.50%) followed by difficulty in understanding the content language of ICT gadgets (68.19%). Possibility of misleading information transmitted through internet (59.56%) and faulty communication between seller/operators and farmers about use of ICT tools (40.14%) were ranked least among the problem faced by farmers in the of ICT tools and devices. The adoption of ICT tools in agriculture by Nagaland farmers faces significant barriers, including infrastructure limitations, socio-economic factors, cultural and linguistic challenges, and lack of digital literacy. Addressing these issues is crucial for enhancing agricultural productivity and rural development.

(Key words: Constraints, devices, farmers, information, Nagaland, technology)

INTRODUCTION

In common parlance, Information and Communication Technology (ICT) refers to electronic devices, networks, mobiles, services and applications which help to disseminate information with the help of technology. ICTs essentially facilitate the creation, management, storage, retrieval, and dissemination of any previously processed and altered data, knowledge, and information. It encompasses a diverse set of technology and applications, including sensors, drones, satellite imagery, mobile applications, and data analytics, which enable farmers to make informed decisions, improve resource utilisation, and boost productivity. In India the mobile subscription penetration as on July, 2014 has been reported to be around 70% (Srivastava, 2014), which suggests that people are rapidly advancing in mobilephone usage.

As such, mobile phones regarded as the widely accessed tool among the farmers for communication and also accessing agriculture-related information particularly

for the marketing of produce (Chhachar *et al.*, 2014). It has changed the way information is communicated, and being able to use this knowledge to enhance the agriculture industry has a huge positive impact that benefits everyone.

The importance of ICT in the field of agriculture research and extension is becoming indispensable. Research, education and extension and farmers are the leading stakeholders of agricultural system (Lemma and Tesfaye, 2016). The performance and capability of each stakeholder to ensure rural food security depends on the continuous flow of agricultural knowledge and information among all stakeholders. Generally, the importance of information is well established in the life of every human being as it serves as a source of knowledge and skills for individuals (Odiaka, 2015). Particularly in the field of agricultural development access to information is one of the basic ingredients to increase farm productivity (Pandey, 2017). To foster adoption of technologies, there is need of better exchange of information among farmers (Aguilar *et al.*, 2015). This augments the vital importance of agricultural information among farmers to decide uptake of innovations.

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Despite the potential benefits of ICT in agriculture, various barriers prevent its widespread acceptance in many farming communities. These constraints may include poor digital infrastructure, low digital literacy among farmers, language hurdles, cultural concerns, and financial restraints. In rural locations, the absence of reliable internet access and electrical supply complicates the effective application of ICT-based agricultural solutions. Furthermore, the digital divide between urban and rural areas exacerbates the situation, as many farmers lack access to cell phones, computers, and other digital devices required to use ICT applications. Technology and data services can be too expensive to access for small-scale farmers with limited resources.

MATERIALS AND METHODS

The present study was conducted in the state of the Nagaland. Nagaland is located in the hills and mountains of the country's northeastern region. There are 17 districts in Nagaland, out of which 6 districts in total were purposively selected: Mon, Tuensang, Phek, Wokha, Mokokchung and Kohima. From each district, 2 blocks were randomly selected for the study. Therefore, a total of 12 blocks was selected for the present study. Out of the selected 12 block 30 respondents from each block were randomly selected for the study making a total of 360 respondents. Descriptive type of research design was followed for the study. Table 1 consists of the socio-economic profile of the respondents which provide crucial context for interpreting farmers' adoption and use of ICT tools. These characteristics were analyzed using mean, Standard deviation, frequency and percentage

Table 2 is about the constraints faced by the respondents in using ICT tools. By examining these constraints, specific challenges that hinders ICT adoption and usage among farmers can be recognized which is valuable for developing targeted solutions. To measure the constraints faced by the farmers in using ICT was done using Garrett's Ranking Technique.

The conversion method was as follows

$$\text{Per cent Position} = \frac{100 (R_{ij}-0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the i^{th} variable by the j^{th} respondents.

N_j = Number of variable ranked by the respondents.

With the help of Garrett's table, the per cent position estimated is converted into scores by referring to the table given by Garrett and Woodworth (1969).

RESULTS AND DISCUSSION

Socio economic profile of the respondents

Table 1 portrays the socio-economic characteristics of the respondents. It was found that majority (65.28 %) of the respondents belong to middle aged category that was in line with the findings by Singh and Kameswari (2019), who also found that majority (48.57%) of the respondents belonged to middle aged category. The study captured the perspectives and experiences of individuals in their prime working years as this age group are more established and are financial stability. Majority (61.94 %) of the respondents were male which is similar to the findings of Arockiaraj and Kumar (2021), who found that 61.6% of the respondents were male. Majority (87.22%) of the respondents belonged to nuclear family. This high percentage reflects a shift away from traditional extended family arrangements and towards more modern, smaller family groups. This trend may have an impact on social support networks, resource allocation within families, and decision-making processes. Majority (72.50%) of the respondents had medium family size (4-7 members). This family size suggests a balance between having children and maintaining a manageable household. 60.56 % of the respondents had medium level of annual income i.e., ₹215031- ₹557652 which is similar to the findings as reported by Laldampuii *et al.*(2023), who also found that 70% of the respondents had medium level of annual income and Kafura *et al.*(2016), also found that 69% of the respondents had medium level of annual income. This income range indicated a relatively stable economic status for most participants.

Constraints faced by farmers towards the use of ICT tools

The data regarding major constraints faced by the farmers towards the use of ICT tools are presented in Table 2. In this study 12 major constraints were identified based on literature reviews and the opinions of the respondents and the ranking was done using the Garrett ranking technique.

Table 2 reveals that lack of training of the farmers towards use of different ICT tools scored the highest total garret score i.e. 25379 and a percentage of 70.50%, therefore it was ranked first among all the identified constraints. Similar results were also found in the study done by Arockiaraj and Kumar (2021) who concluded that lack of training was ranked as the most important constraint. This can be a result of the partiality in dissemination of training given by the state government to the farmers where more focus is given on production technology and lesser importance is given to training with respect to use of information communication technologies and its importance. This was followed by difficulty in understanding the content language of ICT gadgets which scored a garret ranking of 24548 and a percentage of 68.19%. According to the report it was found that use of high technical language in the users' manual of ICT tools was one of the main reasons behind reduction in

Table 1. Socio-economic characteristics of the respondents

Sl. No.	Variables	Category	Frequency	Percentage	Mean	SD
1.	Age	Young (< 41 years)	60	16.67	51.19	10.29
		Middle age (41-61 years)	235	65.28		
		Old (> 61 years)	65	18.06		
2.	Gender	Male	223	61.94		
		Female	137	38.06		
3.	Family Type	Joint	46	12.78		
		Nuclear	314	87.22		
4.	Family Size	Small (<4)	46	12.78	5.56	1.80
		Medium (4-7)	261	72.50		
		Large (>7)	53	14.72		
5.	Annual Income	Low (<₹ 215031)	70	19.44	386341.67	171310.73
		Medium (₹215031-₹557652)	218	60.56		
		High (>₹557652)	72	20.00		

Table 2. Constraints faced by farmers towards the use of ICT tools

Constraints	Garrett Score	Percentage	Rank
Lack of training of the farmers towards use of different ICT tools.	25379	70.50	1
Difficulty in understanding the content language of ICT gadgets.	24548	68.19	2
Lack of uninterrupted power supply.	23974	66.59	3
Lack of awareness of proper functioning about ICT tools.	23635	65.65	4
High cost of ICT tools like computers, smart phones etc.	23133	64.26	5
Inadequate infrastructural facilities for maintenance of ICT tools	22809	63.36	6
Poor mobile/internet connectivity in rural areas.	22270	61.86	7
Lack of belief on e-sources.	21869	60.75	8
Lack of sufficient skills in usage of ICT tools by rural communities.	21781	60.50	9
Lack of local language in handling and understanding of software.	21761	60.45	10
Sometimes possibility of misleading information transmitted through internet.	21440	59.56	11
Faulty communication between seller/operators and farmers about use of ICT tools.	14452	40.14	12

full fledged use of these tools as it was difficult to understand. Lack of uninterrupted power supply was ranked third among the constraints with a garret score of 23974 and a percentage of 66.59% which is similar to the findings reported by Ajijola *et al.* (2015), who also concluded that irregular power supply was ranked as the 3rd constraint. Due to the mountainous terrain and far off locations there is still lack of proper electrical supply in these locations. Lack of awareness of proper functioning about ICT tools with a garret ranking of 23635 and a percentage of 65.65% and ranked fourth among the constraints faced the respondents in using ICT tools which is in line with the findings reported by Sumi *et al.* (2018), who cited in their study that lack of awareness about different sources of information was one of the major constraints faced by the respondents with a Garrett Mean Score (GMS) of 77.03. High cost of ICT tools like computers, smart phones etc. ranked fifth with a garret score of 23133 and a percentage of 64.26%. This was followed by Inadequate infrastructural facilities for maintenance of ICT tools with a garret score of 22809 and percentage of 63.36% followed by poor mobile/internet connectivity in rural areas which had a garret score of 22270 and a percentage of 61.86%. Lack of belief on e-sources was ranked eighth among the constraints faced by farmers with a garret score of 21869 and a percentage of 60.75%. Lack of sufficient skills in usage of ICT tools by rural communities had a percentage of 60.50% and a garret score of 21781 which was similar to the findings reported by Shanthya and Elakkiya (2017), who also reported that lack of skills in usage of ICT tools was a common problem in the community; which was followed by lack of local language in handling and understanding of software which scored a garret score of 21761 and a percentage of 60.45%. This was followed by possibility of misleading information transmitted through internet and faulty communication between seller/operators and farmers about use of ICT tools which had garret score of 21440 and 14452 and percentage of 59.56 and 40.14 respectively.

To address the constraints faced by the farmers in Nagaland towards the use of ICT tools is to develop strategies which prioritize in upgrading rural digital infrastructure, ensuring cheap access to devices and internet services, creating user-friendly applications, and implementing comprehensive digital literacy training programs. Addressing these restrictions systematically will assist to close the gap between ICT's potential in agriculture and its actual application, resulting in increased production, decision-making, and farmer livelihoods.

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