

Awareness and Usage of Technology Oriented Cultivation of Turmeric among Turmeric Farmers in Erode District

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ABSTRACT

Turmeric farming, a cornerstone of agricultural activity in Erode, Tamil Nadu, has undergone substantial progress through the adoption of technology-oriented cultivation practices. This study explores the awareness and utilization of modern technologies among turmeric farmers, focusing on areas such as precision farming, irrigation management, pest control, and post-harvest processes. It examines the factors influencing technology adoption, including education levels, accessibility to resources, and governmental support. The findings spotlight the positive impact of technology on productivity, quality enhancement, and cost-effectiveness, while also identifying barriers such as inadequate training and financial constraints. Recommendations include targeted awareness programs, subsidies, and improved access to agricultural technology. The study underscores the importance of integrating digital tools and sustainable practices to empower turmeric farmers, enhance their livelihoods, and contribute to the region's agricultural growth.

KEYWORDS: Turmeric Farming, Technology Adoption, Precision Agriculture, Irrigation Management, Pest Control, Agricultural Sustainability, User Awareness, Agricultural Productivity, Digital Tools.

1. INTRODUCTION

Turmeric, a vital spice crop with immense cultural, medicinal and economic significance is predominantly cultivated in Erode district, Tamil Nadu often referred to as the “Turmeric City”. The district contributes significantly to turmeric production catering to domestic and international markets. However, traditional farming practices face challenges such as fluctuating yields, pest attacks, soil degradation and climate variability. To address these challenges, technology-oriented cultivation methods have emerged as a promising solution. The integration of advanced technologies such as precision farming, drip irrigation, mobile apps for weather and market updates and mechanized sowing and harvesting has the potential to enhance productivity, reduce costs and promote sustainable farming practices. Despite their proven benefits, the level of awareness and adoption of these technologies among turmeric farmers in Erode District varies due to factors such as education, access to resources and socio-economic conditions. This study focuses on evaluating the awareness and usage of technology-oriented cultivation practices

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among turmeric farmers in Erode. It aims to uncover the extent of technological adoption, the benefits derived and the barriers faced. By identifying gaps and providing actionable insights, the research seeks to support farmers in leveraging technology for improved yields and sustainable turmeric farming practices.

2. REVIEW OF LITERATURE

Ajay (2012) analysed the denoted raising agricultural productivity levels exponentially and devised long-term agricultural development strategies that support the development of local agricultural markets and focus on farmers' needs.

Basavaraja et al., (2008) refer to the study that indicated the technological developments; precision farming has emerged as a promising option for increasing and sustaining the horticultural productivity in the semi-arid tracks. Scope to improve the technical efficiency and strengthen marketing infrastructure to get better prices for increased levels of production would enhance the net returns to farmers. Existing research on crop production.

Dibba (2010) conducted a study on the neglect to consider the nature (i.e., whether technological change is neutral or non-neutral) and magnitude of the change in the technology of crop production from the precision to non-precision farming practices.

Jiaoping, Yangkui & Yaoqing (2009) investigated in their research paper, in which they defined farmers' information literacy as the discovery and receiving of the needed information by farmers themselves and their ability in absorbing and utilizing the acquired information contents to satisfy their information searching and objectives.

Karthick and Mani (2010) concluded that limited scope for expanding land frontiers and further there is increasing trend in diversion of cultivable land for non-agricultural purposes.

Mashroofa (2014) stated that agricultural information literacy is a set of skills and competencies for identifying, accessing, and using agricultural information to improve agricultural productivity. **Maheswari et al. (2008)** evaluated that 'Precision Farming' or 'Precision Agriculture' The goal is to boost productivity, reduce production costs, and minimize the environmental footprint of farming.

Resmi et al. (2013) refer to the study that describes the however, no systematic analysis of how these factors explain the productivity differences between the precision and non-precision farming was carried out. Moreover, existing research in Tamil Nadu has failed to geographic point these two important issues on the technological change associated with precision farming. This study further decomposes the sources of productivity differences between the adopters and non-adopters of precision farming.

Wang (2016) examined the farmers' information literacy, which refers to the fact that farmers could search, judge, and select needed information through the utilization of information equipment such as computers, the internet, and so on, and have the ability to apply the information into agricultural production and daily lives.

3. RESEARCH GAP

While turmeric farming is a critical component of Erode District agricultural economy, existing studies primarily focus on traditional cultivation practices, market trends and production challenges. Restricted investigation has been conducted on the integration and impact of technology-oriented practices in turmeric cultivation, specifically in the context of awareness, adoption and usage among farmers in Erode District Furthermore, the role of socio-economic factors such as education, income levels and access to resources, in influencing technology adoption remains under

explored. There is also a lack of comprehensive analysis addressing the barriers faced by farmers such as the cost of technology, lack of technical knowledge and inadequate support from extension services. This gap highlights the need for a focused study to evaluate the current state of technological awareness and usage, identify challenges and supply unjust recommend for promoting sustainable and efficient turmeric cultivation through technology in Erode district.

4. STATEMENT OF THE PROBLEM

Turmeric farming shows an important function in the agricultural economy of Erode district, celebrated for its significant contribution to turmeric production in India. Dislike its standing, many farmers continue to rely on traditional cultivation methods, which often result in lower yields, higher production costs and vulnerability to environmental changes. The advent of technology-oriented cultivation practices such as precision farming, advanced irrigation techniques and digital tools for pest and soil management, offers immense potential to overcome these challenges. However, the awareness and adoption of these technologies among turmeric farmers remain inconsistent due to factors like limited access to resources, lack of training and socio-economic barriers. This situation raises critical questions about the level of awareness, the degree of technology usage and the challenges faced by farmers in adopting these methods. This study aims to investigate these issues, identify gap sand provide insights to promote effective utilization of technology in turmeric cultivation, ensuring sustainable agricultural development in Erode District.

5. METHODOLOGY OF THE STUDY

This study employed a descriptive survey design to evaluate the awareness and usage of technology-oriented cultivation practices among turmeric farmers in Erode district. A overall of 500 turmeric farmers was selected using stratified random sampling to ensure representation across various regions of the district. Data assemblage was carried out using a structured questionnaire, which focused on the farmer's awareness, adoption levels and challenges in implementing technology-based cultivation practices. Out of the distributed questionnaires, 450 completed responses were received, achieving a response rate of 90%. The ungathered data were analyzed using descriptive and inferential statistical methods to identify patterns, correlations and trends. This methodology facilitated an in-depth understanding of the technological adaptation and its impact on turmeric farming practices, contributing to actionable insights for agricultural development and policy making in the region.

6. OBJECTIVES OF THE STUDY

The specific objective so the future study is:

- To assess the level of awareness among turmeric farmers in Erode district regarding technology-oriented cultivation practices.
- To examine the extent of adoption of modern technological tools and practices in turmeric farming.
- To identify the benefits experienced by farmers through the implementation of technology in turmeric cultivation.
- To analyze the factors influencing the awareness and adoption of technology- oriented cultivation methods.
- To explore the challenges and barriers faced by farmers in adopting advanced technological practices.

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- To provide recommendations for enhancing awareness and usage of technology in turmeric farming for sustainable agricultural development.

7. SAMPLING OF THE STUDY

The study employed a purposive sampling method to ensure the inclusion of turmeric farmers from diverse areas within Erode District. An overall of 500 questionnaires was distributed to farmers actively engaged in turmeric cultivation. Out of these, 450 completed responses were received, achieving a 90% response rate. The sample covered a variety of demographic and geographic segments, ensuring a representative dataset. Primary data collected through the questionnaires focused on cultivation practices, input usage, challenges, and market linkages. The high response rate and broad coverage of the district provide a robust foundation for analyzing turmeric farming practices in the region.

8. STATISTICAL TOOLS

The study employed percentage analysis and Chi-square tests to analyze the data collected from 450 turmeric farmers in Erode District. Percentage analysis was used to summarize demographic information and cultivation practices. ANOVA (Analysis of Variance) helped identify significant differences in farming outcomes based on variables such as irrigation methods and fertilizer use. Chi-square tests were applied to analyse subordinate between categorical variables, such as farming techniques and challenges faced. These statistical tools provided a detailed understanding of the trends, relationships, and variations in turmeric cultivation practices, offering valuable insights for enhancing farming efficiency and sustainability.

RESULTS AND DISCUSSION

Table.1 shows that the frequency and distribution to the Experience in turmeric cultivation of the respondents involved in the study.

Table: 1 Experience in Turmeric cultivation of the Respondents (N=450)

Experience in Turmeric Cultivation	Frequency	Percentage
1-5Years	49	10.9
6-10Years	124	27.6
11-15Years	65	14.4
16-20Years	58	12.9
More than 20 Years	154	34.2
Total	450	100

The bar chart shows that 10.9% of the respondents belong to 1-5 Years, 27.6% of the respondents belong to 6-10 Years, 14.4% of the respondents belong to 11-15 Years, 12.9% of the respondents belong to 16-20 Years and 34.2% of the respondents belong to More than 20 Years are listed. The Experience in Turmeric cultivation profile reveals that the number of respondents belongs to the More than 20 Years.

Figure: 1 Experience in Turmeric Cultivation of the Respondents phone

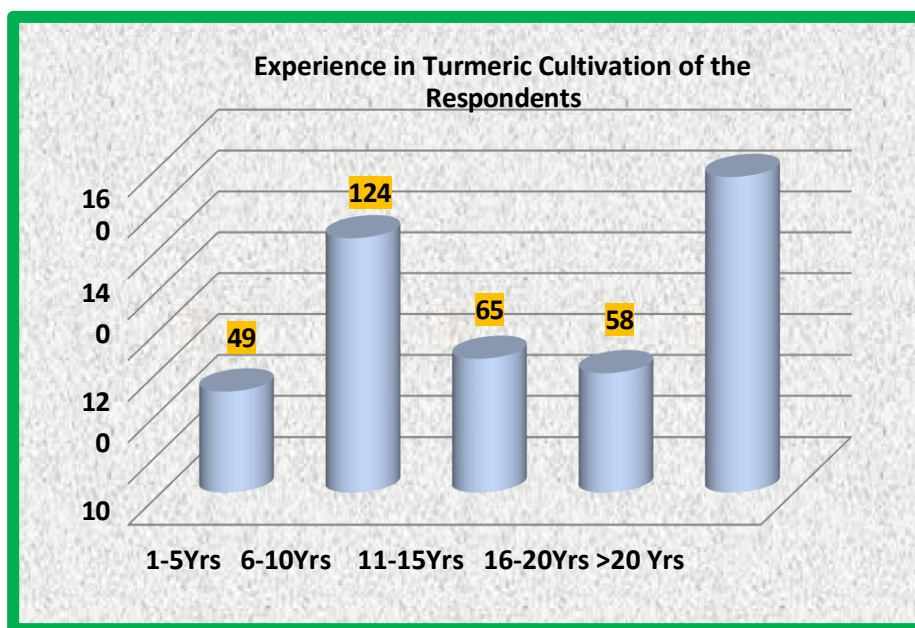


Table: 2 Association between age-wise and frequently used in ICT tools in Smart

Age wise	Frequently used in ICT tools in Smartphone					Chi-Square Value	p- Value
	Daily	Monthly	Rarely	Weekly	Total		
31-40	65-100	0	0	0	65-100	328.854	0.000*
41-50	138-100	0	0	0	138-100		
51-60	51-43.6	16-13.7	50-42.7	0	117-10		
Above 60	16-12.3	0	106-81.5	8-6.2	130-100		
Total	270-60	16-3.6	156-34.7	8-1.8	450-100		

Table-2 represented that provides insights into the age-wise frequency of ICT tool usage on smart phones among individuals, categorized as daily, weekly, monthly, or rarely. Below is the interpretation of the data.

31-40 Age Group All 65 individuals (100%) use ICT tools daily. No one in this group uses these tools monthly, weekly, or rarely. **41-50 Age Group** all 138 individuals (100%) use ICT tools daily. There is no usage reported in the other frequency categories. **51- 60 Age Group** 43.6% (51 individuals) use ICT tools daily. 13.7% (16 individuals) use them monthly, while a significant 42.7% (50 individuals) use them rarely. Weekly usage is not observed in this group. **Above 60 Age Group** Only Small 12.3% (16 individuals) use ICT tools daily. A vast majority, 81.5% (106 individuals) use them rarely, while 6.2% (8 individuals) use them weekly. No monthly usage is reported.

Overall Trends, Daily users account for 60% of the total (270 individuals), predominantly in the younger age groups. Rare users form a significant proportion (34.7%), mainly among individuals above 51 years. Monthly and weekly usage are minimal at 3.6% (16 individuals) and 1.8% (8 individuals) respectively.

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The Chi-square test was used for further analysis. By examining the age-wise distribution and the frequency of ICT tools used on smartphones by respondents, the Chi-square test revealed a significant relationship between these variables. The Chi-square value of 328.854, at a 95% confidence level, is lower than the p-value at a 5% significance level. Therefore, there is a significant association between the age-based distribution of respondents and the frequency of ICT tool usage on smartphones.

Figure: 2 Association between age wise and frequently used in ICT tools in Smart phone

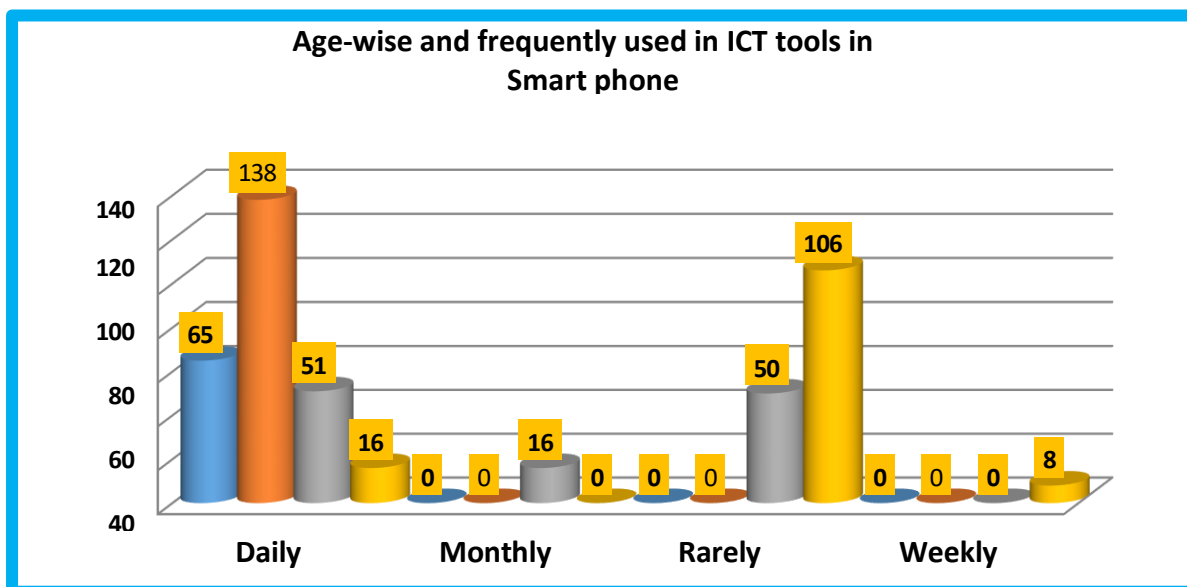


Table: 3 Association between age wise and frequently used in ICT tools in social media

Age wise	Frequently used in ICT tools in social media					Chi-Square Value	p-Value
	Daily	Monthly	Rarely	Weekly	Total		
31-40	49 (75.4)	0 (0.0)	8 (12.3)	8 (12.3)	65 (100.0)	317.642	0.000*
41-50	121 (87.7)	0 (0.0)	0 (0.0)	17 (12.3)	138 (100.0)		
51-60	26 (22.2)	24 (20.5)	42 (35.9)	25 (21.4)	117 (100.0)		
Above60	16 (12.3)	8 (6.2)	106 (81.5)	0 (0.0)	130 (100.0)		
Total	212 (47.1)	32 (7.1)	156 (34.7)	50 (11.1)	450 (100.0)		

Table – 3 indicated that provides insights into the age-wise frequency of ICT tool usage on social media, categorized as daily, weekly, monthly or rarely.

31-40 Age Group Majority of individuals (75.4%, 49) use social media daily. Equal proportions (12.3%, 8 individuals each) use it rarely or weekly. No one in this age grouping uses social media monthly. **41-50 Age Group**

A substantial majority (87.7%, 121 individuals) use social media daily. A smaller group (12.3%, 17 individuals) use it weekly. No monthly or rare usage is observed in this group. **51-60 Age Group Usage** is more diverse: 22.2% (26 individuals) use social media daily, while 20.5% (24 individuals) use it monthly. 35.9% (42 individuals) use it rarely, and 21.4% (25 individuals) use it weekly. **Above 60 Age Group** Daily usage is limited to 12.3% (16 individuals). Most individuals (81.5%, 106) use social media rarely, with 6.2% (8 individuals) reporting monthly usage. Weekly usage is absent in this age group.

Overall Trends Daily users form the largest segment (47.1%, 212 individuals), concentrated among younger age groups (31-50 years). Rare users account for 34.7% (156 individuals), predominantly among individuals aged 51 years and above. Weekly and monthly users make up smaller portions, at 11.1% (50 individuals) and 7.1% (32 individuals), respectively.

The Chi-square test was applied for further analysis. By examining the age-wise distribution and the frequency of ICT tools used in social media by respondents, the Chi-square test revealed a significant relationship between these variables. The Chi-square value of 317.642, at a 95% confidence level, is lower than the p-value at a 5% significance level. Therefore, there is a significant association between the age-based distribution of respondents and the frequency of ICT tool usage on social media.

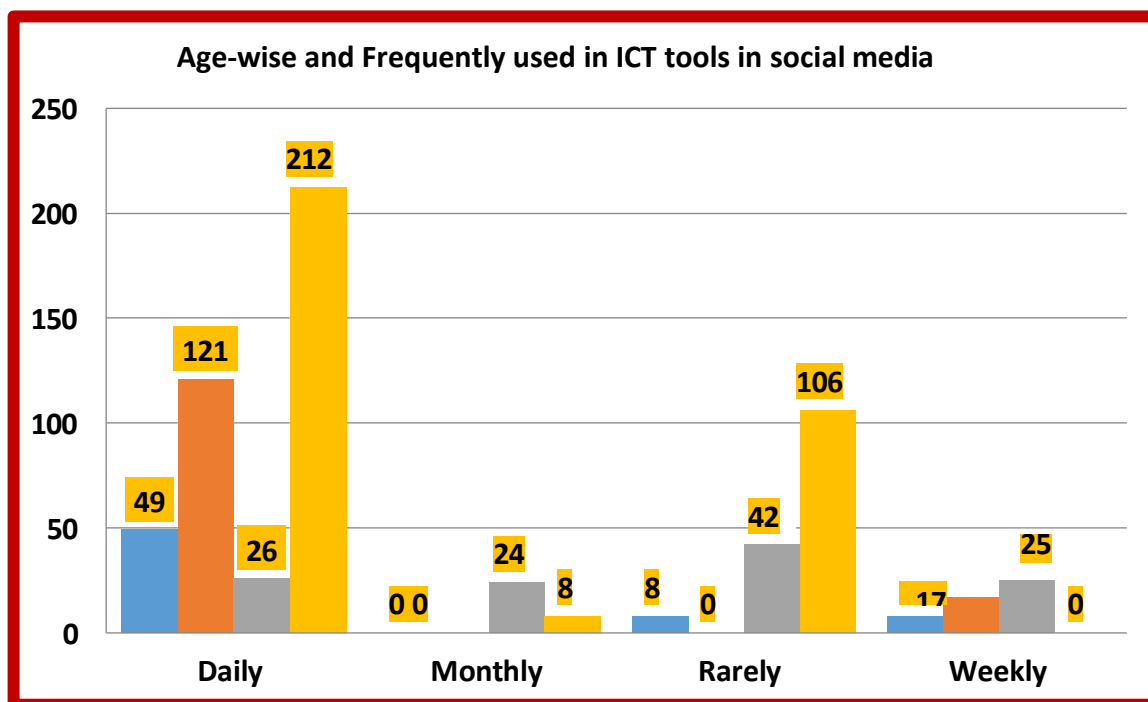


Figure: 3 Association between age wise and frequently used in ICT tools in social media

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Table: 4 Association between gender wise and frequently used in ICT tools in social media

Gender Wise	Frequently used in ICT Tools in social media					Chi-Square Value	p-Value
	Daily	Monthly	Rarely	Weekly	Total		
Male	181 (44.0)	31 (7.5)	151 (36.7)	48 (11.7)	411 (100.0)	17.997	0.000*
Female	31 (79.5)	1 (2.6)	5 (12.8)	2 (5.1)	39 (100.0)		
Total	212 (47.1)	32 (7.1)	156 (34.7)	50 (11.1)	450 (100.0)		

Table-4 reveals the gender-wise frequency of ICT tool usage on social media,

Female The majority (79.5%, 31 individuals) use social media daily. A smaller percentage (12.8%, 5 individuals) use it rarely. Monthly and weekly usage are minimal, at 2.6% (1 individual) and 5.1% (2 individuals), respectively.

Male Daily usage is reported by 44.0% (181 individuals), significantly lower than females. Rare usage is higher among males (36.7%, 151 individuals). Weekly users account for 11.7% (48 individuals), while monthly users make up 7.5% (31 individuals).

Overall Trends Daily users comprise 47.1% (212 individuals) of the total, with females exhibiting a much higher proportion of daily usage compared to males. Rare usage is prevalent among males (36.7%), driving the overall rare usage percentage to 34.7%. Monthly (7.1%) and weekly (11.1%) utilization are more common among males than females.

The Chi-square test was used for further analysis. By examining the gender-wise distribution and the frequency of ICT tools used on social media by respondents, the test revealed a significant relationship between these variables. The Chi-square value of 17.997, at a 95% confidence level, is lower than the p-value at the 5% significance level. Therefore, there is a significant association between the gender-based distribution of respondents and their frequency of ICT tool usage on social media.

Figure: 4 Association between gender wise and frequently used in ICT tools in social media

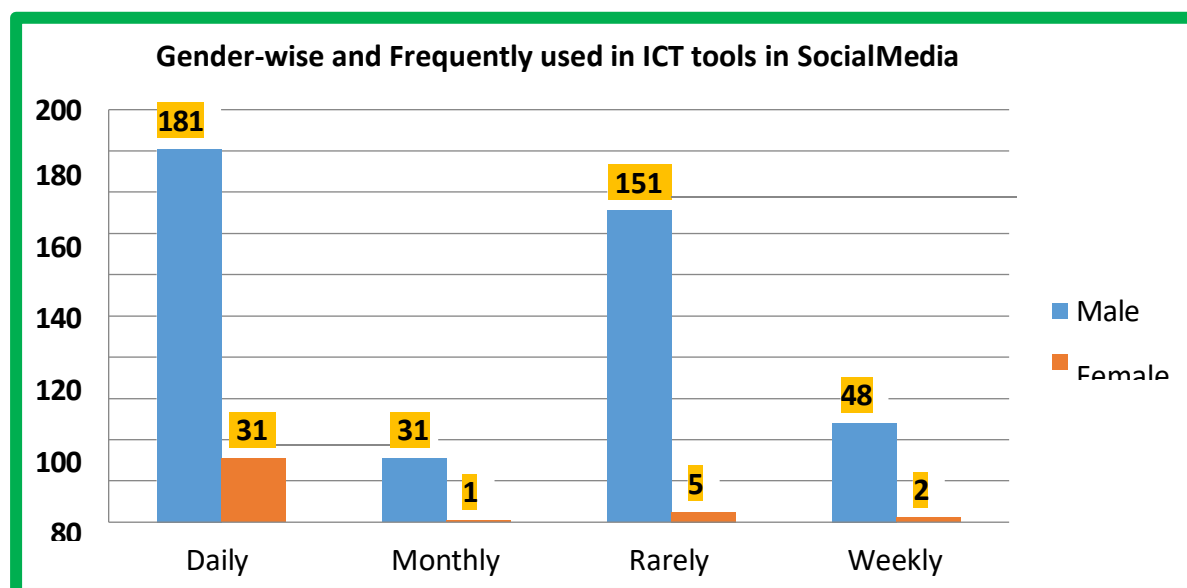


Table: 5 Association between Gender wise and frequently used in ICT tools in Agriculture App

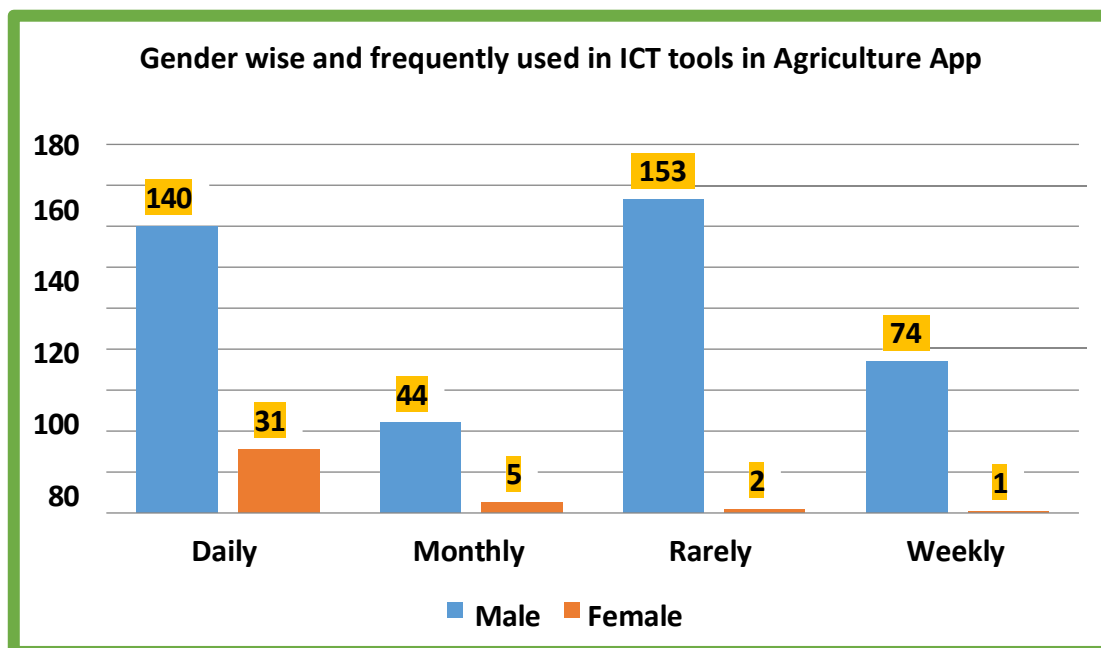
Gender wise	Frequently used in ICT tools in Agriculture App					Chi-Square Value	P-Value
	Daily	Monthly	Rarely	Weekly	Total		
Male	140 (34.1)	44 (10.7)	153 (37.2)	74 (18.0)	411 (100.0)	35.237	0.000*
Female	31 (7.5)	5 (12.8)	2 (5.1)	1 (2.6)	39 (100.0)		
Total	171 (38.0)	49 (10.9)	155 (34.4)	75 (16.7)	450 (100.0)		

Table-5 presents gender-wise frequency data on the usage of ICT tools in agriculture apps,

Female A majority (79.5%, 31 individuals) use agriculture apps daily. Monthly usage is reported by 12.8% (5 individuals), while rare and weekly usage are minimal at 5.1% (2 individuals) and 2.6% (1 individual), respectively.

Male Daily usage is comparatively lower among males, with 34.1% (140 individuals) reporting this frequency. Rare usage is the highest category among males, with 37.2% (153 individuals). Weekly and monthly usage account for 18.0% (74 individuals) and 10.7% (44 individuals), respectively.

Overall Trends Daily users make up 38.0% (171 individuals) of the total, with females contributing a significantly higher proportion than males. Rare users form 34.4% (155 individuals), driven primarily by males. Monthly and weekly users are relatively fewer, comprising 10.9% (49 individuals) and 16.7% (75 individuals), respectively. By analyzing the gender wise and frequently used in ICT tools in Agriculture App of respondents, we used Chi- square test which shows that there is significant relationship between the gender wise summarized distributions of respondents frequently used in ICT tools in Agriculture App. The Chi -square value is 35.237 at 95% confidence which is less than its p value at 5 percent level significance. Hence there is a significant association between gender wise



summarized distributions of respondents frequently used in ICT tools in Agriculture App.

Figure: 5 Association between gender wise and frequently used in ICT tools in Agriculture App

CONCLUSION

The adoption of technology-oriented cultivation Practices have great potential to transforming turmeric farming in Erode District, A region known for its considerable contribution to turmeric production. This study reveals a mixed level of awareness and usage of modern technologies among farmers with some lever aging tools like precision farming and drip irrigation, while others remain reliant on traditional methods due to limited access and knowledge. Key barriers to adoption include financial constraints, inadequate training and lack of institutional support. Tackling these challenges necessitates collective efforts from government bodies, agricultural institutions, and non-governmental organizations to promote awareness, provide subsidies, and facilitate access to affordable technologies.

Empowering farmers with modern tools and sustainable practices can significantly improve crop productivity, quality, and profitability. Enhancing technology adoption will not only strengthen the economic stability of turmeric farmers but also ensure the long-term sustainability and growth of Erode agricultural sector.

REFERENCES

- [1] Ajay, S. Shriram. (2012). Farming has to come first to achieve the MDGs, Ajay-Shriram- UN-MDG.pdf, www.ifdc.org.
 - [2] Basavaraja, H., Mahajanashetti, S.B. and Sivanagaraju, P. (2008). Technological change in paddy production: A comparative analysis of traditional and SRI methods of cultivation. *Indian J. Agric. Econ.*, 63(4): 629-640.
 - [3] Dibba, L. (2010). Estimation of NERICA adoption rates and impact on productivity and poverty of the small-scale rice farmers in the gambia". Kumasi, Ghana: Kwame Nkrumah University of Science and Technology.
 - [4] Jiaoping, Y., Yangkui, X & Yaoqing, D. (2009). An investigative report on information literacy training of individual farmers in centra and on issues related to remedial measures: a case study of farmers information literacy in a few districts of Hubei province, *Chinese Journal of Library and Information Science*, 2(2), 71- 82. Retrieved from <http://ir.las.ac.cn/handle/12502/5342>
 - [5] Karthick, V. and Mani, K. (2010). Comparative economic analysis of tissue culture banana and sucker propagated banana production under precision farming technology in Tamil Nadu, Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, T. N. (INDIA).
 - [6] Mashroofa, M.M. & Senevirathne,W. (2014). Influence of information literacy skills in accessing agricultural information: with special reference to paddy farmers of Ampara district, SriLanka. Retrieved from <http://library.ifla.org/id/eprint/1003/1/140-mashroofa-en.pdf>
 - [7] Maheswari, R., Ashok, K.R. and Prahadeeswaran, M. (2008). Precision farming technology, adoption decisions and productivity of vegetables in resource-poor environments, *Agric. Econ. Res. Rev.*, 21: 415-424.
 - [8] Wang, Cai-Fang (2016). Research in cultivation of farmer's information literacy in information age. Retrieved from <http://dpi-proceedings.com/index.php/dtetr/article/download/6485/6081>
 - [9] Resmi, P., Kunnal, L.B., Basavaraja, H., Bhat, A.R.S., Handigol, J.A. and Sonnad, J.S. (2013). Technological change in black pepper production in Idukki district of Kerala: A decomposition analysis. *Karnataka. J. Agric. Sci.*, 26(1) :76-79.
 - [10] Scott, H. Hutchins. (2007). The role of technology in sustainable agriculture, global director,cropprotectionR&D,Dow Agro Sciences, 9330Zionsville Road,Indianapolis, IN 46268.
- Wilson, Paul, David Hadley and Carol, Asbyc. (2001). The influence of management characteristics on the technical efficiency of wheat farmers in eastern England. *Agric. Econ.*, 24 : 329–338

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