

FARMING IN THE DIGITAL AGE : A STUDY OF ICT PERCEPTIONS AND ATTITUDES AMONG FARMERS

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ABSTRACT

Agriculture is one of the most significant sectors in India. The primary goal of the research was explore farmers' perspectives and attitude regarding the use of ICT. The current study was conducted in Tamilnadu's Madurai District. The study was carried out in Tamilnadu, India's Madurai District in Melur block. The study based on primary data through simple random techniques. Data was gathered using a structured interview schedule developed with consideration of the study's objectives. The data was gathered from 110 farmers in the research area during year 2023. Statistical tools such as descriptive statistics and chi square were employed. The finding reveals the most frequently used ICT tools were mobile phones and television obviously for their ease of usage and wide coverage. The study found that the mean ages of farmers had 34.5, with the majority of the participants had under the age of thirty to forty. The majority of farmers in the possessed a relatively positive attitude and perception towards use of ICT. ICT could also enhanced contact between farmers and extension workers, which saved a lot of time and allowed for immediate responses. This gradually assists policy makers enhanced the farming practises.

(Key words: ICT, attitude, perception, agriculture, farmers)

INTRODUCTION

Information and Communication Technology (ICT) has transformed human thought processes, ability and many aspects of existence (Albert, 2014). Information and communication technologies have recently introduce new ways for exchanging ideas and information. Information and communication technologies differ from traditional media in important ways that provide opportunities to use it in creative ways. ICT is commonly used as a tool to modernise the country's extension network in order to meet the demands of the population's on-going growth. Any tool, application or gadget that enables the sharing or gathering of data through interaction or transmission is considered as Information and Communication Technology (ICT), according to the World Bank. It consists of everything ranging from mobile phones or electronic money transfers to satellite imagery or radios.

The Indian economy depends significantly on agriculture, although growing production is associated with difficulties. The transfer of technology or information could benefit greatly from ICT in the modern day. In the vital economic sector of agriculture, information and communication technology (ICT) not only boosts productivity but also promotes sustainability. It provides food as well income to a significant proportion of the population in developing nations (Bansal *et al.*, 2021, Chavula, 2014 and Singh and Maibam, 2023). ICT assists in addressing the requirement for agricultural produce by

acquiring, disseminating up-to-date information on the climate, raw materials, market price providing information for research and development projects, training farmers, connecting producers and customers through a number of ways. It helps farmers plan their markets to save money on product and protects them from intermediaries those take advantage of an existing information gap. Farmer's need for knowledge, information, as well as technology to improve their produce as a result their level of living and means of subsistence are made available to them through ICT services (Aldosari *et al.*, 2019 and Haquel and Hoque, 2021).

The role of technological innovation in agriculture productivity and development continues to increase everyday (Bansal *et al.*, 2021). One of the most useful and efficient ways to share and exchange knowledge globally among modern ICTs is through mobile devices. Mobile phones facilitate the efficient dissemination of information and knowledge about agricultural markets and technology to farmers, allowing them to immediately implement the knowledge to increase agricultural productivity and facilitate market accessibility (Aldosari *et al.*, 2019, Madhuri *et al.*, 2020, Aboh, 2008 and Agarkar *et al.*, 2023). Person's attitude towards information and communication technology is defined as their level of sentiments, opinions, beliefs and actions in connection to ICT, which can vary to various degrees among persons. Farmers' attitudes as well as perceptions towards using ICT-enabled tools are also evolving. An individual's behaviour and adoption of technologies are significantly influenced by their attitude and perception (Cynthia and Nwabugwu, 2016 and Allahyari

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and Chizari, 2010). Adoption of new innovations and higher yields from agriculture would be facilitated by the positive attitude. In light of these facts, the present investigation was conducted with the following particular purposes, were as examine the attitude of farmers towards the use of Information and Communication Technology and to investigate the perception of farmers towards the use of Information and Communication Technology.

MATERIALS AND METHODS

The current study was conducted in Tamilnadu's Madurai District. The study was carried out in Tamilnadu, India's Madurai District, in the Melur block. The study based on primary data through simple random techniques. Data was gathered using a structured interview schedule developed with consideration of the study's objectives. The data was gathered from 110 farmers in the research area during year 2023. The information gathered was codified, categorised and calculated. Statistical tools such as descriptive statistics and chi square were employed. To employed statements, a number of values were allocated: 'Strongly Agree,' 'Agree,' 'Undecided,' 'Disagree,' and 'Strongly Disagree,' with scores of 5, 4, 3, 2 and 1. 5-point Likert scale was applied to assessed individuals attitudes and perceptions. Based on these scores obtained farmers were classified into three groups based on their attitude scores: least favourable, moderate favourable and highly favourable. Information collected from farmers on socio-economic characteristics such as age, education, monthly income, monthly expenditure and farming experience of farmers. Information regarding ICT adoption Pattern (ownership, accessibility and usage of ICT gadgets to gather agricultural information), perception and attitude of the farmers towards ICT tools. Chi-square test was used to determine the relationship among socioeconomic variables, farmer attitudes and farmer perceptions towards use of ICT.

Chi square Test

The Chi-square test was used to investigate the study's objectives to analyses whether there was relationship between educational qualification, perception and attitude of the farmers towards ICT in the study area. The formula below was used to compute it:

The chi-square was denoted by χ^2 .

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where

O = Observed Frequency

E = Expected Frequency

Degrees of Freedom = (r-1) (c-1)

Hypothesis of the Study

Hypothesis 1: There was no association between educational qualification and perception of the farmers towards ICT tools.

Hypothesis 2: There was no association between educational qualification and attitude of the farmers towards ICT tools. In order to study the educational qualification, perception and attitude of the farmers towards ICT in the study area chi-square test was used.

RESULTS AND DISCUSSION

The data describes that 34.5% of the respondents were belonged to the age group of 25-35 years, 29% of the respondents were belonged to the age group of 45-55 years, 28% of the respondents belonged to the age group of 34- 45 years, 24.5% of the respondents were belonged to the age group below 24.5 years, 4% of the respondents were belonged to the age group of above 4 years in the study area. The data reveals that 81% of the respondents were male and 19% of the respondents were female in the study area. It is evident from the data that the educational level of the respondents, 5.5% of the respondents were illiterate, 13% of the respondents had completed primary school, 20% of the respondents had completed secondary school, 24.5% of the respondents had completed higher secondary, 26.4% of the respondents had completed graduation and 11% of the respondents had completed post graduation and other in the study area. This data revealed that majority of the respondents were graduation educated. It is evident from the data that 50% of the respondents were earning income of rupees 10,000 to 15,000, 25.5% of the respondents were earning income of above rupees 15,000, 17.3% of the respondents were earning income of rupees 5000 to 10,000 and 7.3% of the respondents were earning income of below rupees 5000 in the study area. The data revealed that expenditure of 49% respondents ranged between 10,000 to 15,000, 27.3% of the respondents expenditure was ranged between above 15000, 16.4% of the respondents expenditure was ranged between 5000 to 10, 000 and 7.3% of the respondents expenditure was ranged between below 5000 in the study area. The data explains that 41% of the respondents had farming experience ranged from 10 to 20 years, 39% of the respondents had farming experience ranged from 1 to 10 years, 20% of the respondents had farming experience ranged from above 20 years in the study area. Although had moderate level of education and owning their own land, farmers were involved in businesses other than farming. Their high age factor was shown to make them less inclined to watch television and more reliant on radio for agricultural information. In a similar vein, educated individuals were observed to use new farming methods and innovations more effectively, as evidenced by their increased average yearly earnings (Aldosari *et al.*, 2019 and Panda *et al.*, 2019). Farmer's farming experience and ability to made logical decisions for increased profitability. In the real world, experience was valued more highly by farmers than education. Their capacity to made efficient use of limited resources was improved by farming experience (Osondu and Ibezim, 2015).

It is observed from the data that, 94.5% of the respondents agreed that they were owners of mobile phone and 5.5% of the respondents denied this statement, 84.5% of the respondents agreed that they were owners of television and 15% of the respondents did not agree, 37% of the respondents agreed that they were owners of radio remaining 63% of the respondents denied this statement and 35.5% of the respondents agreed that they were owners of other device and 64.5% of the respondents did not agree. The data reveals that 94% of the respondents agreed that they had access of mobile phone and 6.4% of the respondents denied this statement, 80% of the respondents agreed that they had access of television and 20% of the respondents did not agree, 32% of the respondents agreed that they had access of other devices and 68 % of the respondents did not agree, 31% of the respondents agreed that they had access of radio remaining 79% of the respondents denied this statement and 32% of the respondents agreed that they had access of other devices and 68% of the respondents did not agree. The data explains that 94% of the respondents agreed that they used mobile phone to gathered agricultural information, while 6.4% of the respondents denied this statement, 80% of the respondents agreed that they watch television to gathered agricultural information, while 20% of the respondents denied this statement, 27% of the respondents agreed that they used radio to gathered agricultural information, while 73% of the respondents denied this statement and 32% of the respondents agreed that they used other devices to gathered agricultural information, while 68% of the respondents denied this statement. The findings indicated that the majority of respondents knew a lot about information technology, particularly the internet and mobile phones. They also believed that radio and television were good sources for crucial information that was disseminated in warnings about emergencies and reports (Aldosari *et al.*, 2019). Agriculture Information System (AIS) was a computer-based information system that included all of the

interconnected data that might be of great assistance to farmers in managing information and make decisions on policies. Applications such as radio, television, cell phones, computers, tablets, networking, hardware, software as well as satellite systems were the ICT tools that made farming easier (Anyoha *et al.*, 2018 and Ali, 2012).

The data reveals that farmers' response on perception statements that assessed their opinions about ICT use. 48% of the respondents had a medium degree of perspective of ICT use, 43% of the respondents had a high level and 9% of the respondents had a poor level of perspective of ICT use. The data explains that, 19% of the respondents had low level attitude towards ICT use, 52% of the respondents had medium level attitude towards ICT use and 29% of the respondents had high favourable attitude towards ICT use. The respondents' positive attitudes and perceptions had influenced by their educational background and the ease of using these resources for gained knowledge about agriculture (Raghuprasad *et al.*, 2012 and Khondakar, 2015 and Naik *et al.*, 2021). A significant number of farmers (86%) had medium to highly positive attitude towards agricultural programs on television which helped them understand the content (Choudhury *et al.*, 2019).

It is evident from the estimated results that the significant value of Chi – square test was 19.073. Hence, the null hypothesis was rejected. It is concluded that there was association between educational qualification and perception of farmer towards ICT tools. It is evident from the estimated results that the significant value of Chi – square test was 20.570. Hence, the null hypothesis was rejected. It was concluded that there was association between educational qualification and attitude of the farmers towards ICT tools. Farmers were significantly impacted by participation in society, extension participation and exposure to media because these factors provided farmers to a variety of information sources where they could learn about ICT methods and techniques (Bansal *et al.*, 2021).

Table 1. Socio economic profile

Sl.No.	Characteristics	Category	Frequency	Percentage
1	Age	Below 25Years	27	24.5
		25-35Years	38	34.5
		35-45Years	31	28
		45-55Years	10	29
		Above 55Years	4	4
		Total	110	100
2	Gender	Male	89	81
		Female	21	19
		Total	110	100
3	Education	Illiterate	6	5.5
		Primary school	14	13
		Secondary school	22	20
		Higher secondary	27	24.5
		Graduation	29	26
		Post Graduation and Above	12	11
	Total	110	100	
4	Income	Below 5000	8	7.3
		5000-10000	19	17.3
		10000-15000	55	50
		Above 15000	28	25.5
		Total	110	100
5	Expenditure	below 5000	8	7.3
		5000 – 10000	18	16.4
		10000-15000	54	49
		above 15000	30	27.3
		Total	110	100
6	Farming Experience	1-10	43	39
		10-20	45	41
		Above 20	22	20
		Total	110	100

Source: Primary data

Table 2. ICT adoption pattern (Ownership, accessibility, usage to gather agricultural information)

Sl.No.	ICT tools	Category	Ownership		Accessibility		Use to gather agricultural information	
			Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
1	Television	Yes	93	84.5	88	80	88	80
		No	17	15.5	22	20	22	20
		Total	110	100	110	100	110	100
2	Radio	Yes	41	37	31	28	30	27
		No	69	63	79	72	80	73
		Total	110	100	110	100	110	100
3	Mobile Phone	Yes	104	94.5	103	94	103	94
		No	6	5.5	7	6.4	7	6.4
		Total	110	100	110	100	110	100
4	Other device	Yes	39	35.5	35	32	35	32
		No	71	64.5	75	68	75	68
		Total	110	100	110	100	110	100

Source: Primary data

Table 3. Perception of the farmers towards ICT tools

Sl. No.	Levels	Frequency	Percentage
1	Low level	10	9
2	Medium Level	53	48
3	High Level	47	43
	Total	110	100

Source: Primary Data

Table 4. Attitude of the farmers towards ICT tools

Sl. No.	Levels	Frequency	Percentage
1	Low Level	21	19
2	Medium Level	57	52
3	High Level	32	29
	Total	110	100

Source: Primary Data

Table 5. Educational qualification and perception of the farmers towards ICT tools

Variables	Pearson Chi-square	df	Asymp. Sig (2- sided)
Education qualification	19.073	10	0.039

Table 6. Educational qualification and attitude of the farmers towards ICT tools

Variables	Pearson Chi-square	df	Asymp. Sig (2- sided)
Education qualification	20.570	10	0.024

In regards to the present findings, television and mobile phones were the most commonly used ICT gadgets due to their widespread availability and ease of use. The study found that the mean ages of farmers had 34.5, with the majority of the participants had under the age of thirty to forty. The majority of farmers in the possessed a relatively positive attitude and perception gradually assists policy makers enhanced the farming practises towards use of ICT. Therefore, finding of the study assisted the development of Information and Communication Technologies for delivered extension services in the study places, in addition governments needs to make the steps required to develop those areas into prospective ICT-based agricultural areas. Farmers used ICTs to obtain information about pests and illnesses, market prices, and weather. ICT could also enhanced contact between farmers and extension workers, which saved a lot of time and allowed for immediate responses.

The findings of the research led to the following recommendations such as the extension agents should have access to enough computers, sufficient finance should be allocated towards the maintenance of the ICT infrastructure and government should set up a policy program that will bridge the digital divide and provide digital opportunities for all of the nation's farmers and extension service users.

REFERENCES

- Aboh, C.L. 2008. Assessment of the frequency of ICT tools usage by agricultural extension agents in IMO state, Nigeria, *JASSR*. **8**(2): 2-1.
- Agarkar, A. V., D. T. Undratewad, V.G. Atkare and S. G. Parshuramkar, 2023. New opportunities available with rural dairy farmers of shirur Tehsil of Pune District in milk processing and milk products manufacturing. *J. Soils and Crops*. **33**(1): 215- 220.
- Albert, C. O. 2014. Constraints to Effective Use of ICT among Extension Professionals and Farmers in Extension Delivery in Rivers State, Nigeria. *SJBEMS*. **2**(11): 136-141.
- Ali, Jabir, 2012. Factors Affecting the Adoption of Information and Communication Technologies (ICTs) for Farming Decisions. *J. Agri. & Food Info*. **13**:(1). 78-96.
- Allahyari, M. S. and M. Chizari, 2010. Potentials of New Information and Communication Technologies (ICTs) in Agriculture Sector. *J. Agri. Sci. and Tec*. **4**(4): 115-120.
- Aldosari, F., M. S. A. Shunaifi, M. Amjad and M. Muddassir, 2019. Farmers Perceptions Regarding the Use of Information and Communication Technology (ICT) in Khyber Pakhtunkhwa , Northern Pakistan. *J. Saudi Soc. Agric. Sci*. **18** (2): 211–226.
- Anyoha, N., J. Chikaire, I. C. Godson, E. Ogueri and C. Utazi, 2018. Information and Communication Technology Roles in Improving Women Farmers Access to Agricultural/ Agribusiness Services in Orlu Agricultural Zone of Imo State, Nigeria. *Curr. Inves. Agri. Curr. Res*. **3**(4): 424-427.

- Bansal, V., L. Das, V. Joshi and S. C. Meena, 2021. Attitude and Perceived effects of ICT tools used by Farm Women. *TOJQI*. **12**(10):4633-4642.
- Chavula, H. K. 2014. The Role of ICTs in Agricultural Production in Africa. *J. Dev. and Agri. Eco.* **6** (7): 279–89.
- Choudhury, F.H., M.R. Amin, M.A. Islam and S.D. Baishakhy, 2019. Attitude of Farmers towards Television Programmes in Perceiving Agricultural Information BJEE. **31**(1&2): 171-176.
- Cynthia, E. C. and T. S. Nwabugwu, 2016. Challenges to Adoption of ICT Tools by Agricultural Extension Workers in Anambra State, Nigeria. *AJAEES*. **10** (4): 1–6.
- Haque, M. E. and Z. Hoque, 2021. Utilization and Effectiveness of ICT as Agricultural Information Delivery System in Thakurgao, Bangladesh. *SAJSSE*. **9**(2): 61-64.
- Khondokar, K. H. 2015. Attitude and Level of Knowledge of Farmers on ICT Based Farming. *Eur. Acad. Res.***II** (10): 13177–13194.
- Madhuri, K., S. V. Prasad, V. Sailaja, A. P. K. Reddy and G. M. Naidu, 2020. A Scale to Measure the Attitude of Farmers towards ICTs. *Ind. J. Pure App. Biosci.* **8**:48–52.
- Naik, B. J., B. M. Rao, P. Rambabu and M. S. Rekha, 2021. Attitude of Farmers towards Information and Communication Technology (ICT) Tools. *CJAST*. **39**(43): 72-81.
- Osondu, C. K and G. M. C. Ibezim, 2015. Information and Communication Technologies (ICTs) in Agricultural Extension Service Delivery: A Case Study of Imo State, Nigeria. *Int. J. Agri. Innov. and Res.* **4**(1): 55-58
- Panda, S., Y. L. Devi, L. Das, S. Mondal, K. Pradhan and P. K. Pal, 2019. Socio-Personal Determinants of Farmers Attitude towards Information and Communication Technology (ICT). *Res. J. Ani and Vet. Sci.* **39** (4): 328–331.
- Raghuprasad, K P., S. C. Devaraja and Y M Gopala, 2012. Attitude of Farmers towards Utilization of Information and Communication Technology (ICT) Tools in Farm Communication, *Res. J. Agri. Sci.* **3**(5): 1035-1037.
- Singh, N. J. N. and A. D. Maibam, 2023. Women of Manipur with Reference to the Rural Agricultural System, *J. Soils and Crops*, **33**(2): 425-432.

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