Utilization and perception of farmers about Uzhavan App in Erode district of Tamil Nadu

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Abstract

ICT has ushered in a new revolution in the field of agriculture, playing a pivotal role in enhancing productivity and efficiency. Today, ICT is extensively utilized in agriculture, animal husbandry, and the fishery industry. Various ICT technologies are employed in the agricultural sector, including weather forecasting, crop monitoring, and the optimization of watering and harvesting processes. A prominent area of focus in the current study is the adoption of Information and Communication Technology (ICT) within the Uzhavan app. This study is conducted in Erode district which 120 farmers based on the utilization of Uzhavan app. The ultimate sample size was fixed as 120 multistage random sampling methods were used. The study will seek to identify the variables influencing farmers' decisions to accept and use uzhavan app such as technical skills, costs and regulations. The research will also look into how uzhavan app used to boost farm production, minimize resource consumption and increase farm profitability. Uzhavan app enhanced farmers' access to information related to weather forecasts, market prices, agricultural best practices and government schemes and subsidies. Based on the utilization of the Uzhavan app, SWOC (Strengths, Weaknesses, Opportunities and Challenges) analysis and Responses - Priority Index (RPI) assessment of the factors influencing the adoption and non-adoption of the Uzhavan app have been conducted. The intention of this study is to reveal the constraints faced by the uzhavan app users (Farmers) to operate uzhavan app and also to provide suggestions to overcome the constraints.

Key words : ICT, Uzhavan app, SWOC analysis and Factors influencing the adoption and non-adoption.

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Agriculture is India's primary source of income and plays a significant part in the country's progress. According to the 2021-22 Survey on Indian Economy, more than 60 per cent of India's total workers are employed in the agricultural sector and totally backs roughly 18.8 per cent to the GDP. Indian agriculture market value stood at USD 435.9 billion and is expected to reach USD 580.82 billion by 2028, growing at a CAGR of around 4.9 per cent between 2023 and 2028. This is the primary source of income for most rural households. As a result, agriculture is regarded as a fundamental pillar of the Indian economy (https://www.timesofindia.com), March-28, 2023. Farmers are still struggled dealing with low income, poor access to reliable and timely market information, weak supply chains, inadequate storage facilities and lack of credit facilities. Three out of every four farmers are at risk of crop damage from pests and weather and half of Indian farmers lack access to conventional or traditional funding sources and they also lack basic farming equipment in the country. For the preparation of the manuscript, relevant literature[1-3] has been consulted.

Information and communication Technology (ICT) :

ICT has created a new revolution in the field of agriculture. Today, ICT is extensively used in agriculture, animal husbandry and fishery industry. ICT technologies in agricultural sector like weather forecast, crop-monitoring, watering and harvesting. It represents a tremendous opportunity for rural populations to improve productivity, to enhance food and nutrition security, to access markets and to find employment opportunities in a revitalized sector.

Examples of ICT solutions in agriculture include various agricultural management software apps, market information systems for informed decision-making, weather forecasting and monitoring tools for precise crop management, e-learning platforms for continuous agricultural education and mobile apps tailored for agricultural-related tasks. These digital tools empower farmers and stakeholders in the agricultural sector with the data and knowledge they need to enhance productivity and make well-informed choices.

A prominent area of focus in the current study is the adoption of Information and Communication Technology (ICT) within Uzhavan app. This ICT technology offer farmers a digital pathway to address a wide array of challenges, enhancing their efficiency and effectiveness in agricultural practices. The integration of technology into agriculture is rapidly transforming the sector, it is a new era of productivity and sustainability for Indian farmers.

Uzhavan App :

In today's digital era, smartphones have emerged as an incredibly effective means of delivering information. They have revolutionized the way we access and consume content, making information more accessible and convenient than ever before. Tamil Nadu government has come out with a mobile app named Uzhavan which includes eighteen different services. The intention of providing timely, reliable and quality information for agricultural services. Tamil Nadu Government launched bi-lingual (Tamil and English) Uzhavan mobile app, in a bid to use technology for benefit of farmers. It was launched by

Chief Minister of Tamil Nadu in the state capital Chennai on April 8, 2018. The size of the Uzhavan app was just 3.93 MB and it was made freely available to the people in Google play store and Apple store. Nearly 16,38,847 (AGRISNET, 2023) people had downloaded the Uzhavan app. Once the person downloaded the Uzhavan app, they had to go through the process of one time registration and after that, they gain access to advance their knowledge about both current central and state subsidy schemes and even they can register in the Uzhavan app for availing it. Uzhavan app users could insure their crops by using the Uzhavan app, they could also check for fertilizer stocks and seeds stocks availability in their region during the demand and kharif season. This App users also thought that the Uzhavan app's availability during the Gaja Cyclone was very helpful and they came to the realization that they did not need to spend additional time or ask for assistance in order to find agricultural information.

Around 81.18 Lakh farm families in the state, Stakeholders, viz., Seed Agencies, Fertilizer and Pesticide agencies besides various wings of the Department of Agriculture and other agri-related departments for taking appropriate decisions as well as a Decision Support System to maintain effectiveness in the input supply chain (https://cms.tn.gov.in), 5-April, 2018.

In the present study, the number of Uzhavan app users or downloads in Erode district reached 61,315 farmers during the period from 2018 to 2023. Approximately 16,38,847 farmers in Tamil Nadu have registered and using the uzhavan app during the period of 2018-2023. The Salem district stands out with the highest number of uzhavan app users with 95,160 farmers actively utilizing the app whereas Nilgiris district had the fewest users with 5,225 farmers using this platform are presented in the Fig. 1.
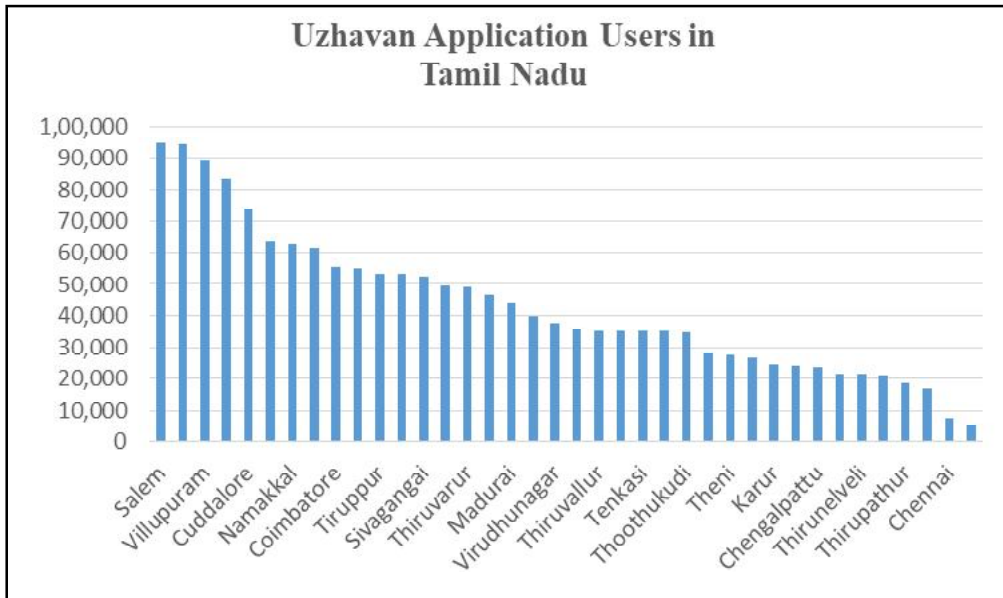

Figure 1. List of Uzhavan App users in Tamil Nadu (2018-2023).

Even though the app was performing well it lacks in some aspects, the intention of this study is to reveal the constraints faced by the uzhavan app users (Farmers) to operate uzhavan app and also to provide suggestions to overcome the constraints.

Objectives :

The general objective of this research work is to study the usage of uzhavan app by farmers in Erode district of Tamil Nadu.

The specific objectives are

➢ To measure the level of access, availability and usage of uzhavan app among farmers
➢ To identify the bottlenecks in the usage and availability of Uzhavan app and to suggest suitable policy measures for the better adoption of uzhavan app.

This study was conducted in Erode district of Tamil Nadu. Primary data collection was carried out through which 120 farmers based on the utilization and Perception of Uzhavan app. The ultimate sample size was fixed as 120 multistage random sampling methods were used to select the sample farmers from the study area.

Tools of Analysis :
a) SWOC Analysis :

SWOC is a strategic planning technique used to help a person or organization identify the strengths, weakness, opportunities and challenges related to business competition or project planning.

Strengths and weakness are frequently internally related while opportunities and challenges commonly focus on environmental placement.

Strength - Characteristics of a company or initiative that provide it an advantage over competitors.

Weakness – Characteristics of the firm that put it at a disadvantage in comparison to others.

Opportunities – Elements of the surroundings that the company or project could use to its advantage.

Challenges – Environmental factors that may pose problems for the business or project.

b) Responses - Priority Index (RPI) :

In the quantification of constraints expressed by the farmers, there was a problem, whether emphasis should be given for the number of responses to a particular priority or to the highest number of the responses to a constraint in the first priority. But, both lead to different conclusions.

A Responses - Priority Index (RPI) was constructed as a product of Proportion of Responses (RP) and Priority Estimate (PE), where PR for the ith constraint gives the ratio of number of responses for a particular constraint to the total responses as per equation.

$$RPI = \frac{\sum_{j=1}^{k} fij X |(k+1) - j|}{\sum_{i=1}^{1} \sum_{j=1}^{k} fij} \quad 0 \leq RPI \geq 5$$

Where,

RPI = Response Priority Index for i^{th} constraint

f^{ij} = Number of responses for the jth

priority of the ith constraint (1=1,2,.....1, j=1,2,3,......k)

$$\sum_{j=1}^{k} f_{ij} = \text{Total number of responses for } i^{th}$$
constraint

k = Number of priorities (1.strongly agree; 2. Agree; 3. Moderate; 4. Disagree; 5. Strongly disagree)

$X_{[(k+1)-j]}$ = Scores for the jth priority

$$\sum_{i=1}^{1} \sum_{j=1}^{k} f_{ij} = \text{Total number of responses}$$
to all constraints

$$\sum_{i=1}^{1} RPI = \text{Summation of RP indices for all}$$
constraints,

Here, larger RPI, higher would be the importance for that constraint.

SWOC Analysis :

SWOC analysis is conducted to identify the critical driving and retarding factors of success. Table-1, depicts the major prospects of SWOC of Uzhavan app using farmers.

Table – 1. SWOC Analysis

Strength	Weakness
➢ It provides a wide range of agri-related information to farming, making it a valuable resource for farmers. ➢ It supports multiple local languages, with content available in Tamil. ➢ Daily market prices shown from 277 regulated markets and helping them avoid traders and middlemen. ➢ Weather forecasting is important for planning day-to-day activities and available 24-72 hours in advance. ➢ Crop insurance scheme on seed and fertilizer availability at nearby government, private and co-operative outlets. ➢ Farm mechanization is made available to small and marginal farmers to create sustainable agricultural productivity.	➢ In rural areas where internet connectivity is often limited. ➢ Limited digital literacy, making it difficult for them to effectively use the app. ➢ Lack of technical skills and knowledge required to navigate and make the most of the app's features. ➢ Regularly updating content and providing support can be resource-intensive. ➢ Competing agricultural apps or traditional sources of information that could pose a challenge to Uzhavan's market share. ➢ Training or education which could be a challenge to implement.

Opportunities	Challenges
➢ As smartphone adoption increases in rural areas, there is a growing potential user base for the app. ➢ Pest and disease diagnosis and market data should be more accurate, providing customized recommendations to enhance its value for farmers. ➢ NGOs & FPOs can help expand Uzhavan app reach and access to resources. ➢ Expand to e-commerce for agricultural inputs, market price information and financial services for farmers. ➢ Offering online courses or training modules on modern farming techniques can attract more users and enhance their skills.	➢ Uzhavan may face competition from other apps offering similar services. ➢ Changes in agricultural policies or regulations can impact the app's functionality and relevance. ➢ Privacy concerns and mishandling of data could lead to reputational damage or legal issues. ➢ Fluctuations in crop prices, weather patterns and other market conditions can affect the app's effectiveness and user satisfaction. ➢ The app could be vulnerable to security breaches, data theft, or cyber-attacks, which could undermine user trust.

Responses - Priority Index (RPI) :
i) Factors influencing for the adoption of Uzhavan app :

The response priority index was employed for the factors for the adoption of uzhavan app and the results are presented in table - 2.

Table - 2. Factors for the adoption of Uzhavan app

S. No	Factors	No. of Response					Total	RPI	Rank
		I	II	III	IV	V			
1	Daily market prices	39	21	11	5	4	80	0.50	I
2	Weather updates	25	31	12	7	5	80	0.48	II
3	Language support for rural farmers	23	17	28	5	7	80	0.47	III
4	Government schemes and subsidies for all types of crops	19	31	12	13	5	80	0.46	IV
5	Crop advisories for best practices	21	15	11	25	8	80	0.44	V
6	Training and support of agricultural practices	12	16	21	22	9	80	0.429	VI
7	Rental information of agricultural machineries	25	11	17	15	12	80	0.426	VII
8	Marketing information of FPO product	15	18	23	14	10	80	0.42	VIII
	Total							640	

The most important factor for the adoption of Uzhavan app expressed by farmers was daily market prices (0.50) can play a crucial role in a farmer's decision-making process. This was followed by weather updates (0.48) are essential for farmers to reliable and up-to-date weather information, Providing language support (0.47) for rural farmers is crucial for ensuring that they can access and benefit from agricultural resources, information and technology. Government schemes and subsidies (0.46) for crops vary by country and region and the specific programs offered can change over time.

Crop advisories for best practices (0.44) are recommendations and guidelines provided to farmers to help them make informed decisions and adopt the most effective and sustainable methods for crop cultivation, Training and support for agricultural practices (0.429) are essential for helping farmers acquire the knowledge and skills they need to improve their crop yields, agricultural sustainability and overall livelihoods. The rental of agricultural machinery (0.426) is a common practice that allows farmers to access the equipment they need without the high upfront costs of purchasing and to effectively market products produced by Farmer Producer Organizations (FPOs), (0.42) it's important to consider various strategies and channels that can reach the target audience and maximize sales.

ii) Factors influencing for the non-adoption of Uzhavan app :

The response priority index was employed for the factors for the non-adoption of uzhavan app and the results are presented in table - 3.

Table–3. Factors for the non-adoption of Uzhavan app

S. No	Factors	No. of Response					Total	RPI	Rank
		I	II	III	IV	V			
1	Digital illiteracy	45	19	9	3	4	80	0.52	I
2	Privacy concern about personal contact details	21	32	12	9	6	80	0.47	II
3	Resistance to change	16	22	13	25	4	80	0.454	III
4	Network connectivity issues in rural areas	19	29	11	12	9	80	0.450	IV
5	High cost of smartphones	11	19	26	17	7	80	0.44	V
6	Lack of communication facilities	15	11	18	26	10	80	0.43	VI
7	Lack of awareness and training programs	18	15	22	16	9	80	0.42	VII
8	Lack of brief information about government schemes and subsidies	23	14	13	18	12	80	0.41	VIII
Total							640		

The most important factor for the non-adoption of Uzhavan app expressed by farmers was Digital illiteracy (0.52) among many farmers may lack the necessary skills and familiarity with digital technologies, making it challenging for them to navigate and utilize the app effectively. This was followed by privacy concerns (0.47) regarding personal contact details are a valid consideration for many individuals, especially when it comes to using apps or online platforms. Resistance to change (0.454) is a common human tendency and it can manifest in various situations, including the adoption of new technologies or practices like the Uzhavan app, Network connectivity issues (0.450) in rural areas can pose significant challenges, the lack of robust internet infrastructure in rural regions often results in slow and unreliable network connections, hindering seamless access to online platforms.

High cost of smartphones (0.44) can pose a significant barrier for many farmers may find it challenging to invest in expensive smartphones, which are essential for accessing and benefiting from digital tools designed to improve agricultural practices, the lack of communication (0.43) facilities such as poor network coverage or limited access to telecommunication services, can significantly impede the effective use of apps like Uzhavan in rural areas. The lack of awareness and training programs (0.42) can be a significant obstacle to the successful adoption of apps like Uzhavan in rural communities. The lack of brief information about government schemes and subsidies (0.41) can be a significant hurdle for many farmers may not be fully aware of the various support programs and incentives offered by the government to enhance agricultural practices. This lack of information can result in missed opportunities for farmers to benefit from schemes that could positively impact their livelihoods.

Uzhavan app enhanced farmers' access to information related to weather forecasts, market prices, agricultural best practices and government schemes and subsidies. It facilitated community engagement and knowledge-sharing among farmers. Long-term sustainability and scalability of the app, including its ability to reach more farmers and adapt to changing agricultural needs. Hence, the Uzhavan app holds immense potential for the future, particularly in catering to the evolving needs of young farmers and newcomers to the agricultural sector. By prioritizing content visibility and user-friendly features, the app can become the go-to platform for individuals venturing into farming as a profession. Introducing a comprehensive crop calendar within the app would prove invaluable, aiding both seasoned farmers and newcomers in planning and managing their agricultural activities efficiently.

To enhance awareness, leveraging the involvement of agricultural college students could be a strategic move. These students, equipped with knowledge and enthusiasm, can serve as ambassadors, actively disseminating information about the app's utility and benefits among farming communities. Their engagement could bridge the awareness gap and foster a sense of trust and familiarity with the app. Furthermore, to cater to the diverse agricultural

landscapes, the Uzhavan app should focus on providing location-specific recommendations. Tailoring information based on geographic and climatic conditions ensures that farmers receive precise and relevant guidance for their specific region, ultimately leading to more effective and sustainable farming practices. The future scope of the Uzhavan app lies not only in technological advancements but also in its ability to empower the next generation of farmers, making agriculture more accessible, informed and productive.

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