Enhancing Rural Farmers Skills Through ICT Applications In Tripura

[1]Asmita Debbarma , [2]Dr. P. Sakthivel

[1]Research scholar of Annamalai University, Tamil Nadu, IndiaDepartment of Political Science & Public Administration Email: asmitadebbarma1996@gmail.com
[2]Professor of Department of Political Science & Public AdministrationAnnamalai University, Tamil Nadu, India

Abstract

Agriculture is considered as the means for growth in Tripura, just as it is in many othernations who are still in the process of establishing their economies. This paper examines how ICT applications can enhance the skills of rural farmers in Tripura. Further, the study analysesthe ICT initiatives of successive governments in Tripura to empower farmers in the region, andto explore the benefits of ICT applications in agriculture and related farming activities. The findings indicate that the ICT initiatives have provided rural farmers with access to informationon crop management. Weather, forecasts, market prices, and government schemes, leading to improved agricultural practices and productivity. However, the study identifies severalchallenges in implementing ICT initiatives in rural areas of Tripura, including lack of awareness and knowledge about ICT applications, inadequate infrastructure, and limited financial resources. Despite these challenges, the study concludes that ICT applications have the potential to empower rural farmers in Tripura, and there is a need of concerted efforts to address these challenges and ensure that the benefits of ICT reach all farmers in region.

Keywords: Agriculture; Information; Market Access; Technology; Transformation.

Introduction

Since the beginning of human civilisation, agricultural practises have a significant historical presence. It is the secret to the growth of all living things as well as the driving forcebehind the

achievements of any nation. Agriculture is one such area that requires immediate and adequate attention in order to secure its long-term viability and to assure the well-being ofthe people in emerging countries. Even though, farmers are the most essential stakeholders in this sector, the information need to make the best decisions at the appropriate time in the farming life cycle is not sufficiently available to them.

The spread of knowledge on agricultural inputs using information and communicationtechnology which allows for increased access to and utilisation of agricultural input information, plays an important role in developing the skills of farmers in Tripura. The agricultural sector is the backbone of Tripura's efforts to ensure food and nutrition security, promote sustainable development, and reduce poverty. Almost two-thirds of the labour force is engaged in agriculture and related industries. However, much untapped potential remains inagricultural settings most of the food is grown by farmers in the rural regions in Tripura. However, they are lagging because of the many internal and external obstacles they must overcome. There are several obstacles in achieving sustainable development, including a lack of resources and access to technology, market monopolisation, seasonal fluctuations, unfair distribution of knowledge, and so on. However, government of Tripura has taken the initiative to accurate weather forecasting, decreased water consumption, higher yields, and larger net profits are all possibilities in agricultural field in Tripura. The increasing agricultural output islargely attributable to the paradigm shift brought about by the usage of technologies with the help of governments for rural farmers in the state of Tripura.

Research Objectives

1. To elicit the ICT initiatives of successive governments in Tripura to enhance the skills of the farmers.
2. To analyse the advantages of ICT applications in empowering the rural farmers in Tripura.
3. To explore how far the ICT facilities has improved agriculture and its related forming activities in Tripura.
4. To identify the challenges faced by rural farmers in Tripura in implementing and utilizing ICT applications for enhancing their skills, and to proposed solutions to overcome these challenges.

Scope of the study

Tripura is making enormous strides toward becoming a leading information society. Inrecent times, it has enhanced both its volume and its accuracy, enabling better access to expansion of all aspects of social life. This improvement has been made possible by technologythat serves to empower people who live in rural areas by improving their access to natural resources, improved agricultural technologies, effective production tactics, marketplaces,banking and financial services, and other amenities of a similar nature. This is accomplished by improving their access to the internet. In rural areas, it is used for the advancement of a large variety of fields, including education, agriculture, medical treatment, and a wide variety of other fields. The implementation of information and communication technology (ICT) in Tripura's agricultural sector has the potential to usher in a new era of increased productivity and profitability for the farmers of the state. When it comes to production, marketing, profit, and others areas that are closely tied to agriculture, traditional farming techniques, which are currently undergoing an evolution, face a vast number of challenges. The implementation of information and communication technologies (ICT), which have a significant influence on therise in the standard of living enjoyed by rural small landholder farmers, is an essential step toward addressing the challenges that are associated with traditional agriculture. The expandingusage of information and communication technology is one factor that adds to the rising demand for innovative ways. In addition to this, it helps individual who live in rural areas become more self-reliant by providing better access to natural resources, innovative agricultural technologies, more effective production strategies, market places, banking, and financial services, and so on. This article explores the ways in which rural farmers in the stateof Tripura might improve their ICT skills with the assistance of governments and the implementation of ICT.

Methodology

The research adopts both descriptive and document methods to examine the relationship between information and communication technologies (ICTs) and the improvement of famers' skills in Tripura. The study relies heavily on data from a variety ofsources, including research articles published in books and journals, official reports of theTripura government, and information obtained from newspapers etc.

Initiatives taken by Governments in Tripura

The Indian government places a premium on the well-being of farmers, and numeroussocial programmes are in place to help them resuscitate the agricultural economy. Likewise, the Tripura Government has also adopted various schemes for the welfare of the rural local farmers to improve their wellbeing and economic conditions. Soil Health Card Scheme, Neem Coated Urea, Paramparagat Krishi Vikas Yojana (PKVY), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), e-NAM (National Agriculture Market), PMFBY (Pradhan Mantri Fasal Bima Yojana), and Interest Subvention Scheme are the programmes introduced by the Government of Tripura for the benefit to all the farmers.

National Agriculture Market (e-NAM): Initiation of an electronic marketing platform at thenational level is one of the goals of the National Agriculture Market plan (e-NAM), which aims to promote the building of infrastructure to allow electronic marketing in the marketplaces across the state. This new market mechanism is modernising Agri markets by assuring better price discovery, bringing in transparency and competition, and enabling farmers to earn fairerpayment for their goods. This is a step toward achieving the goal of 'One Nation One Market.' Many farmers have already registered on the e-NAM site in order to meet the goal of integrating their markets into the e-NAM system. Corporate cooperative, and non-governmental groups are implementing a variety of ICT-based agricultural extension activities. ITC, IFFCO Kisan Sanchar Limited (IKSL), BSNL, Reuters Market Light (RML), Nokia Life Tools, Fisher Friend Project, e-Aqua, Rubber Board, and the Department of Agriculture in other State are just a fewexamples of companies that provide services relating to agriculture through SMS and Voice communications. As well, Tripura Government adopt few of the initiatives.

Kisan Call Centre: The formerly managed from Guwahati, Assam (before October 2018), andnow managed from Agartala (as of October 2018 onwards) for the states of Tripura, Meghalaya, and Mizoram. Managers from IFFCO and State Line call-back and message- pushing modes are available for the farmers to reach out the governments. The typical monthlycall volume Is between 60 and 65 (Tripura Desk).

Reliance Foundation Voice Message Service: The beginning operations in the West and North Tripura districts in April of 2019, the voice message has been functioning in the North

Tripura district since 2016. The management is handled by the Reliance Foundation and the State KVK. The mode is now set to push the messages of the KVK advisories. The domain area is only Agriculture at this time; Fishing and AH Sector services have not yet been initiated.Line department data was gathered for this database.

However, the primary emphasis of both programmes has been on agriculture-based agro advising services, while fisheries and other crucial aspects of farm livelihood systems have been ignored. Most of the programmes in Tripura are built on a push-based strategy for distributing Agro-advisory services to rural communities. As a result, there has been no attempt taken in Tripura toward developing a pull- and pushed-based cell phone fishing advisory system. In addition, none of the projects included experiments with need-based training, capacity development programmes, or back-end knowledge management systems. Before making any kind of significant effort to implement a mobile-based advice system in Tripura, itis very necessary to have a cursory look at the state of the mobile phone network there. Virtuallyevery farmer and member of the family now own a mobile device of some kind (either a smart phone or a feature phone). The availability of mobile networks and data connectivity in the rural areas of Tripura is adequate (Airtel, BSNL, and Jio have fair to good coverage, while IDEA and Vodafone have weaker signals). Economics Research Unit of the Statistics Department, Telecommunications Department, Ministry of Communications, and Government of India provides better programmes for developing the rural communities.

Emerging technologies in Farming

The future of ICT is increasing day by day in Tripura. Additionally, it aids in meeting the expanding consumption requirements of the rural population in Tripura. Farmers are willingto adopt new technology and wish to solve various issues which they are facing while farming.Smart and developing technology provide quick work in less time than physical labour. Each farmer can so satisfy the needs of the populace in terms of food. Additionally, smart technologies can be used in a variety of ways to better farmers' operations.

Sensor Agriculture

The sensor is a highly evolved instrument that can detect natural phenomena like heat,light, moisture, and so on. It automates the process of translating any physical phenomenon or state of

nature into a digital equivalent. Whether a farmer is interested in organic or conventional methods, sensors of all kinds can be useful.

Ariel Imaging Technology

Satellites and other low-altitude aircraft, such as drones, using ariel scanning technique to take pictures from above are examples. Most importantly, this technology gives an eye viewof the farm. Furthermore, its simple collection enables duties easier without leaving the workplace and delivers reliable data relating to crops. Also, it can provide a generally reliable assessment of crop uniformity for the development at large.

Weather tracking Technology

Depending on the atmosphere, location, and time situation, the weather tracking tool ismostly utilised for weather forecasting. It can be a lot of work for the farmers to manually predict the weather in every area. This technique so facilitates easy weather monitoring and prognostication. A variety of agricultural practises, such as watering and fertilising crops, can be timed with the help of the weather monitoring system. There is also a handy calendar that tells when it is best to get out into the field and start planting.

Advanced Tractor

Driverless Tractor is use as the new technology for the farmers in Tripura to modernisethe farming system that provides higher efficiency and reduce the interruption of human at work. It is more advance and reliable for the farmers to have the safety measures in the farmingsystem.

Result and DiscussionThe need of ICT

Technologies of information and communication play a crucial role in bringing about this shift. Computers, other electronic communication devices, and data management are all included in this category. These resources make it easier to collect, organise, and share data and insights. The progress that has been made recently in delivering ICT services, especially to the agricultural sector. Farmers, who tend to be in more remote places, can benefit from having access to information and communication technology in order to better carry out their daily tasks. The Internet and other associated technologies are

used to deliver these services. In this way, we may rest assured that cutting-edge ICTs will be used to great effect in the development, deployment, and evaluation of new and existing agricultural software. Many distinct categories apply to the data spread through ICT. These are:

I. Weather Reports

II. Specific on Costs

III. Education and Health Resources

IV. Methods and Manufacturing Outputs

V. Private and Public Buildings

VI. Data on Supply and Demand

India's agricultural sector has benefited greatly from the use of various ICT strategies. The main technologies involved in Farmer's call centres are:

i. Desktop and Laptop computer system with Internet connectivity.

ii. Teleconferencing and telephones with headphones.

iii. High bandwidth telephone line.

The primary goal is to provide extension services to the farming community using mediums that are accessible to and understood by the locals. When a farmer contacts the toll-free supportline number 1551 (symbolic), the first crucial question is answered by recent college graduateswith expertise in agriculture. Farmers incur essentially little financial outlay to acquire this information, and they receive feedback in their own tongues. As questions arise that require more in-depth information, agricultural scientists will travel to the fields to answer those questions.

Attitude towards ICT

The factors that influenced rural farmers' adoption of ICT in Tripura were revealed bythe phenomenon of information and communications technology's success in the countryside.For ICT to be a success in Tripura, the state and municipal governments there need to take a positive stance. The individual's reaction to everything and anything that is linked to it is disrupted or altered. It can be set up according to one's level of interest in agricultural pursuits.An optimistic outlook is crucial for the successful implementation of ICT to improve the quality of life in rural areas. People in rural areas of Tripura are very appreciative of the effortsmade to bring the benefits of

information and communication technology (ICT) to their community. However, due to lack of sufficient knowledge regarding ICT, they are unable to use it on a consistent basis. Zhang and Aikman (2007) concluded that an individual's attitude may operate as a mediator between that individual's attitude towards an object and their desire to behave in a particular way in response to that item. If prospective users have a favourable attitude towards a particular information and communications technology (ICT), it will be easier for them to decide whether to adopt or make use of the ICT. This is especially true for those living in rural areas. This is something that should be grasped by organisations or privatebusinesses that are involved in the process of growth. In addition, there should be efforts madeto find the factors that can contribute to a positive attitude towards the application of information and communication technology. This should be a focus of the efforts. Hence, in order to ensure the success of information and communications technology, the rural community, and notably its leaders, need to have a positive attitude towards the application ofICT. This is particularly important in terms of ensuring the longevity of the sector.

Advantages of ICT in Agriculture

Many information and communication technology (ICT) applications exist within the agricultural sector, and online forums and communities of practise promote knowledge sharing among farmers, government officials, agricultural professionals, and non-governmental organisations (NGOs) on a global scale. They educate the public on the many ways that ICTs may aid in agricultural progress. A fundamental focus of the field of study known as "information and communication technology in agriculture" (ICT in agriculture) is the creationand implementation of novel applications of ICTs in the rural sphere, with a particular emphasison the agricultural sector. The use of information and communications technology (ICT) in farming can help with a variety of issues. Any medium through which information can be transmitted or collected interactively is considered an ICT. The phrase "Information and Communication Technology/Technologies" (ICT) refers to all forms of electronic media and their related services and applications, including but not limited to radio, television, cellular phones, computer and network hardware and software, satellite systems, and so on. Information and communication technology (ICT) is helping farmers increase their yields by providing them with crucial data on planting, protecting crops,

and boosting soil fertility. The followingare some additional benefits of using Technology in the agricultural sector:

1) The use of ICT and the E-Agricultural facility has increased farmers' production and income.

2) Management and use of resources that is both effective and efficient.

3) Timely information on rain and other factors is available to the farmer.

4) Information and evaluation on optimal farm production, agro-environmental resource management, etc., can help inform policy and decision-making with the help of GIS and othersimilar tools.

5) Rural tourism, real estate for remote workplaces, e-commerce, and virtual corporations of small farms are just some of the potential new agricultural and rural businesses that could emerge as a result.

6) Telemedicine, distance education, remote public services, remote entertainment, etc., can allbe made available to rural communities, making for a more convenient and secure alternative to city living.

7) Improve Extension services and the Farmers' Redressed system with new decision-support, knowledge-management, and advisory systems.

8) Competitive and sustainable farming that produces safe goods can be achieved by better farmmanagement and farming technologies, including risk management, knowledge transfer, and effective information. The farmer must make crucial choices, such as what to plant, in this aide.When should seeds be planted? the problem of controlling the spoiled brat. While thinking about things like getting your product to market, the effects on the environment, and how the business operates. It is certain that a decision-support system based on IT could aid in their deliberations.

9) To address the growing concern about the safety of food in the wake of significant contamination scares like the one caused by the bird flu, it can provide the systems and tools necessary to ensure food safety and traceability.

Challenges

Agriculture is the backbone of Tripura's economy, accounting for over 60% of its workforce. The state's rural areas are home to many small and marginal farmers who are still heavily reliant on traditional farming practices. In recent years, there has been a concerted effort by the government to enhance the skills of rural farmers using local governments and ICT applications. While this initiative has yielded positive results, there are still numerous challenges that need to be addressed. The study outlined challenges that need to be tackled to enhance the skills of rural farmers in Tripura. They are follows:

Lack of Access to ICT Infrastructure: One of the primary challenges faced by rural farmers in Tripura is a lack of access to ICT infrastructure. Many rural areas lack basic facilities such as electricity and internet connectivity, which makes it difficult for farmers to use ICT applications effectively.

Limited Digital Literacy: Another significant challenge is the limited digital literacy among rural farmers. Many farmers are not familiar with the use of ICT applications, which hinders their ability to leverage these tools to enhance their farming skills.

Poor ICT Infrastructure: Even in areas where ICT infrastructure exists, the maintenance of these facilities is often poor. This results in frequent disruptions to services, which can be frustrating for farmers who rely on these tools.

Inadequate Access to Finance: Many rural farmers in Tripura struggle to access finance, which makes it difficult for them to invest in the tools and technologies required to enhance their farming skills.

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Lukewarm Government Support: Despite the government's efforts to enhance the skills of rural farmers, there is still insufficient support provided to farmers. This lack of support makes it difficult for farmers to adopt new technologies and practices.

Climate Change: Climate change is a sufficient challenged faced by rural farmers in Tripura. Changes in weather patterns and increasing temperatures can have a negative impact on crop yields, which can result in sufficient losses for farmers.

Limited Access to Market Information: Many rural farmers in Tripura struggle to access market information,

which make it difficult for them to make informed decisions aboutwhat crops to grow and where to sell them.

Limited access to Agricultural Inputs: Farmers in rural areas often face difficulties in accessing agricultural inputs such as seeds, fertilizers, and pesticides. This limits their abilityto produce high quality crops.

Soil Degradation: Soil degradation is a significant problem in many rural areas in Tripura. This results in reduced crop yields and makes it difficult for farmers to adopt new farming practices.

Limited access to Extension Services: Extension services are critical in enhancing the skills of rural farmers. However, in many rural areas of Tripura access to these services is limited, which hinders the adoption of new technologies and practices.

Inadequate Storage Facilities: Many rural farmers in Tripura struggle with inadequate storagefacilities, which can lead to spoilage of crops and losses.

Lack of Proper Irrigation Facilities: Inadequate irrigation facilities can significantly affect crop yields, particularly in areas with limited rainfall. This can result in losses for farmers and make it difficult to adopt new farming practices.

Limited access to Agricultural credit: Access to agricultural credit is critical for farmers looking to invest in new technologies and practices. However, many rural farmers in Tripura struggle to access credit, which hinders their ability to adopt new technologies.

Poor Market Linkages: Even when farmers produce high quality crops, poor market linkages can result in losses. Improving market linkages.

Suggestions and Recommendations

Based on the findings of the research paper, the following suggestions and recommendations are proposed to enhance the effectiveness of the intervention and improve the livelihoods of rural farmers in Tripura.

Strengthen ICT Infrastructure: In order to fully harness the potential of ICT applications for rural development, it is important to ensure that there is adequate infrastructure in place. This includes not only access to hardware and software but also internet connectivity and power supply. The local government and private sector should work together to expand access to ICT infrastructure in rural areas, with a particular focus on areas with low connectivity.

Increase investment in training and capacity-building: While ICT tools can be a powerful tool for enhancing farmers skills and knowledge, it is important to provide adequate training and capacity building opportunities to ensure that farmers are able to effectively utilize these tools. The government and other stakeholders should invest in training programs that focus on building farmers ICT literacy and digital skills, as well as other relevant topics such as marketing, financial management, and sustainable agricultural practices.

Develop targeted information and advisory services: In addition to improving accessto information through ICT tools, it is also important to develop targeted information advisory services that can address the specific needs and challenges of rural farmers in Tripura. This may include services such as weather forecasting, market price information, and pest and disease management advice. These services should be designed with input from farmers themselves and should be delivered through a variety of channels, including mobile phones, radio, and community meetings.

The research paper highlights the important role that governments can play in supporting rural farmers. To further enhance the effectiveness of these institutions, there is a need to strengthen their capacity to provide services and support to farmers. This may includeproviding training and resources to local government officials, as well as promoting greater community participation in local governance. Foster public-private partnership: Given the complexity of the challenges faced by rural farmers, it is important to foster public-private partnerships that can leverage that strengths and resources of different stakeholders. Private sector organizations can provide valuable support in areas such as market linkages, financial services, and access to technology. These partnerships should be designed with a long-term view and should prioritize the needs of rural farmers.

The proposed suggestions and recommendations can help to build on the successes of the intervention and improve the livelihoods of rural farmers in the region. By working togetherand adopting a holistic approach, stakeholders can create a more sustainable and equitable agricultural sector in Tripura.

Implications of Study

The implications of this study for enhancing rural farmers' skills through ICT applications in Tripura are significant. Firstly, the study highlights the potential benefits of using ICT applications in agriculture and related farming activities, including

improved crop management, weather forecasting, and access to government schemes and market prices. Secondly, the study emphasizes the need for concerted efforts to address the challenges faced by rural farmers in utilizing ICT applications, including inadequate infrastructure, lack of awareness and knowledge, and limited financial resources. Therefore, policymakers, government officials, and other stakeholders involved in enhancing rural farmers' skills should focus on providing adequate infrastructure, training, and technical support to farmers to enablethem to use ICT applications effectively. This includes ensuring access to affordable and reliable technology and internet connectivity, offering language and cultural-sensitive training programs, and providing financial assistance to support ICT adoption. This study's implications provide valuable insights into the potential of ICT applications to enhance rural farmers' skills and the need for concerted efforts to address the challenges faced by farmers onadopting and utilizing these technologies effectively in Tripura.

Conclusion

The study evaluated the effectiveness of using ICT applications to enhance the skills ofrural farmers in Tripura. The paper explored the various challenges faced by rural farmers in the region, including inadequate access to information, lack of market information, and limited access to resources and training.

The findings of the study shows that the intervention had a positive impact on the farmers skills, knowledge, and productivity. The farmers reported significant improvements in their access to information and market linkages, which helped them to make informed decisionsabout their farming practices. The intervention also helped to build the farmers capacity and confidence, which in turn enhanced their productivity and income.

The study highlights the important role that governments and ICT applications can playin addressing the challenges faced by rural farmers. The study recommends that more financialresources should be allocated to support the development of ICT infrastructure in rural areas, as this can bridge the digital divide and improve access to information and services for rural farmers. Overall, the research paper concludes that the use of ICT applications can be an effective strategy for enhancing the skills of rural farmers in Tripura. The paper emphasizes the need for continued investment in this

area, in order to ensure that rural farmers are equippedwith the knowledge and resources they need to thrive in today's increasingly complex and competitive agricultural sector.

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