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Agriculture and Information Technology – A Case Study of ITC Ltd.,- ILTD Division

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Abstract

Agriculture is the major source of living for majority of Indians, to improve the productivity and the living conditions of the people living on agriculture information technology(IT) plays a vital role, this paper examines the role of information technology in agriculture and the benefits the farmers getting by using information technology and examines how ITC Ltd.,- ILTD Division has improved the productivity of the farmers and their living conditions.

Introduction

Information and communication technologies (ICTs) in agriculture technology comprise those networks, mobiles, devices, services, and applications that aid the processing, management, and exchange of data, information, or knowledge with a target audience. They include a broad range of converging technologies, including traditional telecommunications, television and video, radio, CD-ROMs, cell phones and smart devices, and several modern technologies such as computers and the internet, sensors, Geographic Information Systems, satellites, and the like. Essentially, the purpose of ICT is to transfer information from one point to another.

Impact of ICT on Agriculture and Information Technology

In modern farming technology, the role of ICT as a decision support system for farmers. Through the assistance of ICT, farmers are able to stay updated with all recent information. This

is inclusive of data about weather, agriculture, and newer and more advanced ways of enhancing crop quality and production.

ICTs have largely revolutionized the way people, governments, and businesses, both large and small, function in the modern world. Close to 60% of the global population has access to the internet, and mobile internet is now the most widely-used channel for internet access worldwide. The tremendous adoption of ICTs has made it possible to facilitate better communication and ensure the delivery of services and information to people who previously lacked access.

The infusion of new, advanced agriculture technologies has allowed the global agriculture sector to surge ahead and transform the way producers cultivate, harvest, and distribute agricultural commodities. The use of technology in Indian agriculture, or e-agriculture, has accelerated agricultural and rural development by adopting innovative ways to improve the existing information and communication processes. It has particularly revolutionized smallholder agriculture in several agrarian economies and has helped address several challenges associated with the traditional form of agriculture.

Objectives

1. To understand the benefits of the usage of IT in agriculture
2. To understand the benefits obtained by ITC Ltd.,- ILTD Division by implementing IT in agriculture

Research Methodology

In research methodology the important thing is the sources of collection of data, it can be classified into primary and secondary. Primary data is collected directly from the respondents and the secondary is through book and magazines. In this study the data is collected both primary and secondary sources. The type of research is case study approach as ITC Ltd., - ILTD is chosen as study.

The method of research considered in the article is case study method approach, ITC Ltd., - ILTD Division has been considered for the article as a case as they have implemented the 'E-Choupal' which has helped many farmers catering to the needs the ITC Ltd.,- ILTD Division

to improve the productivity and also their living conditions by using Information Technology in their farming activities.

Understanding Modern Technology Used in Agriculture

The agricultural scene today requires the integration of sophisticated technologies such as temperature and moisture sensors, robots, GPS technology, and aerial images, to name a few. On this note, ICT helps meet the elevated demand for newer approaches. Such digital farming tech also aids in empowering rural farmers by allowing better access to effective production strategies, banking and financial services, etc.

Agriculture is the lifeline of the Indian economy. India is the second highest agricultural producer in the world and has the largest area of arable land. India leads production worldwide in several commodities, including shrimps, spices, mango, papaya and bananas and is the second largest producer of rice. Currently, at \$42 bn, India's agri exports have the potential to double in alignment with global demand. Yet, the Indian agricultural sector, like many other global counterparts, faces multiple challenges. Firstly, a disproportionately large percentage of Indian workforce is dependent on agriculture. As much as 70% of Indian rural households rely primarily on the agricultural sector for their livelihoods. The sector provides employment to nearly 55% of the total workforce in the country, whilst contributing only 17.8% of the country's GVA, highlighting the chronic challenges of low productivity, investments and incomes. Second, agriculture is particularly vulnerable to the threat from climate change. Experts warn that if climate change is not reined in, frequency of extreme events such as heatwaves could increase by 75 times in India by 2050, leading to reduction in wheat yields by 50% in the Indo-Gangetic plains, amongst others. Thirdly, like climate change, population growth is a global challenge, given the increased need for food production with limited land and depleting natural resources. This has particularly stressful implications for Indian agriculture. By 2050, world population is expected to reach 10 billion, implying that 2 billion additional people will need to be provided food security. An article in National Geographic states that farmers will have to produce, within the next 40 years, the total quantum of food produced over the last 8000 years!

Benefits of IT in Agriculture

The Benefits of IT is increasing in agriculture are mentioned below.

a. Empowering Smallholder Agriculture

In developing countries, ICT in agriculture provides farmers with vital information pertaining to sowing, crop protection, and improving soil fertility that enables them to improve agricultural productivity. Weather-related advisories and alerts help them prepare for sporadic events such as floods, drought, or even pest and disease outbreaks, thus preventing significant crop loss. ICTs also provide them with a reliable channel to seek the best market price in the local markets and other daily updates for their produce to ensure they receive fair returns.

The increasing penetration of budget-friendly mobile phones and the internet is an added advantage for farmers living in c areas in several emerging nations. Access to inexpensive mobile devices has now made it easier for them to acquire additional information and services that enable informed decision-making.

Now, the use of the latest technology in agriculture in the world has ensured that with a touch of a few buttons, agriculturists can connect with the global network of farmers, agronomists, businesses, and other service providers to stay up-to-date on the latest crop cultivation practices.

For policymakers, the advantage of adopting ICT in agriculture is that information sharing enables them to gain a better understanding of the situation at the ground level, which will contribute to the designing and implementation of agrarian and rural development policies that benefit the farmers. The ICT's extensive reach to even the remotest location can also help them address issues concerning gender bias, women empowerment, and other socioeconomic concerns.

Regulatory policy and governance

The widespread adoption of digital technologies by agriculturists is resulting in an exponential increase in the availability of a wide range of big data that can aid better policy-making and monitoring, as well as help transform the agriculture sector.

Agricultural extension and advisory services

ICT in the form of innovative media platforms bridges the gap between farmers on one end and agricultural researchers and extension agents on the other. It is a more cost-efficient method to improve smallholders' knowledge of current agricultural practices and markets.

Enhanced market access

ICT-enabled market information services enhance farmers' access to nearby markets and their awareness of current consumer demands through the transfer of information from the traders. ICTs also foster networking among the agri-stakeholders, which facilitates increased market access for inputs and product marketing and trade.

Environmentally sustainable agriculture

Budget-friendly mobile phones, internet, and other services to disseminate information, in addition to providing rural farmers with improved access to climate-smart solutions and the appropriate knowledge to use them.

Early warning system (EWS) for disaster management

ICTs provide actionable and real-time information to governments and communities on disaster prevention and management. They also increase the efficiency of responding efforts during emergency situations and drive more effective communication by providing the people with timely advice on risk mitigation procedures.

Food safety & traceability

A combination of simple and sophisticated technologies, such as mobile phones, software solutions, RFID tags, data input websites, and sensors using GPS technology, among others, enable producers to capture and monitor reliable data and also comply with international traceability and food

Financial inclusion and risk management

ICTs strengthen rural and smallholder farmers' access to financial services, enable them to find affordable insurance schemes and tools to better manage risk, and empower them with information regarding financial services that are available to them.

Capacity building and empowerment

ICTs serve as vital education tools for the development of local communities. They broaden the reach of women, youth, and other beneficiaries and open the doors for newer business opportunities to enhance livelihoods and incomes.

ITC Ltd.,- ILTD Division – E Choupal

ITC's Agri Business Division, one of India's largest exporters of agricultural commodities, has conceived e-Choupal as a more efficient supply chain aimed at delivering value to its customers around the world on a sustainable basis. The e-Choupal model has been specifically designed to tackle the challenges posed by the unique features of Indian agriculture, characterised by fragmented farms, weak infrastructure and the involvement of numerous intermediaries, among others.

The unsuccessful Value Chain - Farm to Factory

'e-Choupal' also unshackles the potential of Indian farmer who has been trapped in a vicious cycle of low risk taking ability, low investment, low productivity, weak market orientation, low value addition, low margin and low risk taking ability. This made the farmer and Indian agribusiness sector globally uncompetitive, despite rich & abundant natural resources.

The Model in Action

Appreciating the imperative of intermediaries in the Indian context, 'e-Choupal' leverages Information Technology to virtually cluster all the value chain participants, delivering the same benefits as vertical integration does in mature agricultural economies like the USA. 'e-Choupal'

makes use of the physical transmission capabilities of current intermediaries - aggregation, logistics, counter-party risk and bridge financing -while disintermediating them from the chain of information flow and market signals. With a judicious blend of click & mortar capabilities, village internet kiosks managed by farmers - called sanchalaks - themselves, enable the agricultural community access ready information in their local language on the weather & market prices, disseminate knowledge on scientific farm practices & risk management, facilitate the sale of farm inputs (now with embedded knowledge) and purchase farm produce from the farmers' doorsteps (decision making is now information-based).

Real-time information and customised knowledge provided by 'e-Choupal' enhance the ability of farmers to take decisions and align their farm output with market demand and secure quality & productivity. The aggregation of the demand for farm inputs from individual farmers gives them access to high quality inputs from established and reputed manufacturers at fair prices. As a direct marketing channel, virtually linked to the 'mandi' system for price discovery, 'e-Choupal' eliminates wasteful intermediation and multiple handling. Thereby it significantly reduces transaction costs.

'e-Choupal' ensures world-class quality in delivering all these goods & services through several product / service specific partnerships with the leaders in the respective fields, in addition to ITC's own expertise. While the farmers benefit through enhanced farm productivity and higher farm gate prices, ITC benefits from the lower net cost of procurement (despite offering better prices to the farmer) having eliminated costs in the supply chain that do not add value.

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The Status of Execution

Launched in June 2000, 'e-Choupal', has already become the largest initiative among all Internet-based interventions in rural India. 'e-Choupal' services today reach out to over 4 million farmers growing a range of crops - soyabean, coffee, wheat, rice, pulses, shrimp - in over 35000 villages through 6100 kiosks across 10 states (Madhya Pradesh, Haryana, Uttarakhand, Uttar Pradesh, Rajasthan, Karnataka, Kerala, Maharashtra, Andhra Pradesh and Tamil Nadu).

The problems encountered while setting up and managing these 'e-Choupals' are primarily of infrastructural inadequacies, including power supply, telecom connectivity and bandwidth, apart from the challenge of imparting skills to the first time internet users in remote and inaccessible areas of rural India.

Several alternative and innovative solutions - some of them expensive - are being deployed to overcome these challenges e.g. Power back-up through batteries charged by Solar panels, upgrading BSNL exchanges with RNS kits, installation of VSAT equipment, Mobile Choupals, local caching of static content on website to stream in the dynamic content more efficiently, 24x7 helpdesk etc.

Going forward, the roadmap includes plans to integrate bulk storage, handling & transportation facilities to improve logistics efficiencies. As India's 'kissan' Company, ITC has taken care to involve farmers in the designing and management of the entire 'e-Choupal' initiative. The active participation of farmers in this rural initiative has created a sense of ownership in the project among the farmers. They see the 'e-Choupal' as the new age cooperative for all practical purposes.

This enthusiastic response from farmers has encouraged ITC to plan for the extension of the 'e-Choupal' initiative to altogether 15 states across India over the next few years. On the anvil are plans to channelise other services related to micro-credit, health and education through the same 'e-Choupal' infrastructure.

Another path-breaking initiative - the '**Choupal Pradarshan Khet**', brings the benefits of agricultural best practices to small and marginal farmers. Backed by intensive research and knowledge, this initiative provides Agri-extension services which are qualitatively superior and involves pro-active handholding of farmers to ensure productivity gains. The services are customised to meet local conditions, ensure timely availability of farm inputs including credit, and provide a cluster of farmer schools for capturing indigenous knowledge. This initiative, which has covered over 91,900 CPKs, has a multiplier impact and reaches out to around 11 Lakh farmers.

In this context, the Government of India's policy thrust provided in the agricultural sector through precisely targeted interventions and focused reforms are indeed commendable. The

vision for ‘Doubling Farmers’ Income’, ‘More Crop per Drop’, among others, has been the guiding force for collaborative solutions developed by ITC.

ITC: A Legacy of Farmer Empowerment Over the years, the ITC e-Choupal ecosystem, together with the company’s social investment programme, has contributed significantly to address the chronic challenges of productivity, sustainability and climate vulnerability as well as market access. To contribute to the Government’s vision of doubling farmers’ incomes and enhancing farmer livelihoods, ITC initiated a unique programme to help multiply farmer incomes and also collaborated with NITI Aayog to improve agriculture and other allied services in 27 aspirational districts of 8 Indian states. These initiatives, together with several others, some of which are being discussed in this publication, have led to the creation of a new dimension in India’s farming sector, emphasising farmers’ capability to earn higher incomes and become more resilient to the chronic challenges.

ITC is one of India’s largest procurers and exporters of agri-commodities, sourcing over 3 million tons from 20 crop value chain clusters across 22 States. It is India’s second largest procurer of wheat after the Government’s Food Corporation of India. ITC’s competitive and inclusive agri value chains, anchored by ITC’s world-class FMCG brands, provide consumers with high quality products while generating substantial farm sector livelihoods. ITC’s ‘Farm to Fork’ agri-value chains enable the Company to source differentiated, value-added, identity preserved, traceable raw materials, and enables ITC’s Foods business to manufacture world-class food brands with consumer preferred value traits. Supporting the efforts to empower farmers through vibrant agri value chains anchored by ITC’s world-class food brands, the Company has also invested in state-of-the-art Integrated Consumer Goods Manufacturing & Logistics (ICML) facilities located across the country, contributing to the Government’s Vision of ‘Make in India’. Recognising that innovation is key to creating winning products that address the evolving needs of consumers, ITC has also made significant investments to create a frontier Life Sciences Technology Centre (LSTC) in Bengaluru, India to facilitate unique product development. ITC LSTC is also engaged in an ambitious R&D programme in the Agrisciences domain to address future demands of food security, improved yields & quality and development of new varieties.

Moving up the Value Chain:

ITC's Value-added Agriculture Leveraging its deep engagement in agriculture, strengths in Food Processing and R&D capabilities, ITC is scaling up value addition in agriculture to progressively create new opportunities for farmers and enhance farm incomes. Medicinal and Aromatic Plant Extracts ITC's customised crop development programme with farmers in Madhya Pradesh, India aimed at deepening expertise in Medicinal and Aromatic Plant Extracts, covers over 5,000 acres so far. The programme is being expanded significantly. ITC's institutional synergies enable it to work with farmers to develop robust models for value-added segments with vibrant brands. Some examples are: food-safe IPM Chillies, organic mango pulp traceable to farms, specialty coffee certified for fair trade, end-use specific wheat flours, frozen snacks, and so on.

Findings and Suggestions

1. The e-choupal provided several economics benefits to ITC as well as the customer. Web-enabled real time data on crop prices provide the farmer with the market prices for their produce. ITC gains as intermediaries are removed, and transportation costs decrease.
2. The intermediaries were not removed from the value-chain, instead they were made as *samyojaks* (coordinators) who assist ITC in setting up new e-choupals. They also handle the physical transportation of the goods and earn a commission on it.
3. By providing information on weather and scientific farming methods, and the supply of high quality farm inputs, ITC enabled the farmers to improve their efficiency and quality of their output. This also provided indirect benefits to the company reducing the risk in several areas of the supply chain
4. e-choupal also provided ITC with an effective marketing vehicle. ITC gives "Bonus points" for produce which are much higher than quality norm. This can be exchanged for other ITC products. ITC also uses e-Choupal as a medium to advertise consumer products.

Conclusion

With the growth of Information technology in various sectors the agriculture sector has also gained the benefit of the IT revolution, the best example as discussed is the implementation of e-chopal. The farming sector can increase its productivity and cater the needs of the growing population, it was estimated that the population will be 1.4 billion by 2024 in order to cater the needs the people and to increase their life styles the farming industry has to adopt information technology.

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