

A Study on The Role of E-Technology to Tackle The Agricultural Distress In India

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Abstract

Farming was the primitive and most basic occupation which man has practiced to earn his livelihood. The modern technology being the most advanced has a key role to play in reforming traditional agriculture practices in India. Economies continue to develop and the percentage of the people employed in the agricultural sector is declining. A report proposes that a 1% increase in GDP leads to a .052 decrease in the percentage of people employed in agriculture. But through e-technology productivity in agriculture can be increased and these improvements will boost farmers' profits, by cutting costs and increasing yields, and also benefit the consumers. The present paper analyzes the role e-Technology in resolving agriculture distress in the country. The paper makes aware how alternative farming practices apart from traditional farming are the need of the day. It also studies the initiatives taken by both the government and private sector in this direction.

Keywords: e-Technology, Dry land farming, Precision farming.

Introduction

Agriculture sector is the core sector and the backbone of Indian economy for food and nutritional security, sustainable development, inclusive growth & for poverty alleviation. It contributes approximately 17 % of GDP. The country's food grain production stood at 252.23 million tonnes in 2015-16, a production of 271.98 million tonnes in 2016-17 and 277.49 million tonnes in 2017-18, India touched foodgrains production of 315.7 million in 2021-2022. Although the production is increasing but the profitability of farmers is stable. The Indian farmers are using agriculture technique which are old and outdated which results in uncertainty in their production.

This state of agriculture can be revolutionized only by technological innovations. Technology has a wider scope in agriculture development and increasing farmers income. **The focus of modern agriculture has to be shifted from more "productivity" but to "profitability".**

Objective

The major objectives of the research are –

- To study the meaning and scope of e-Technology for development of agriculture.
- To know the forms of alternative farming's which can be practiced in India.

- To identify the major initiatives taken by both the government.
- To suggest measures encouraging role of e-Technology and in agriculture.

Research Methodology

The Indian agriculture sector is facing various challenges. The research paper on the title – "A study on the role of E-technology to take over agricultural distress in India" is based on descriptive-Analysis method. The research is done on secondary sources and various articles and research papers are studied. The research paper tries to explore the new opportunities created by e-technology in agriculture sector for gaining productivity and profitability.

Use of e-Technology in agriculture: world scenario

The Food and Agriculture Organization, the United Nations' agency published a report in 2009 which suggested that by 2050 agricultural production will have to rise by 70% to meet projected demand. According to a report by the 'Indian Council of Food and Agriculture' only 40% to 45% of Indian agriculture has been mechanized. But the farm mechanization percentages in other countries is – 95% of US agriculture, 90% of Australian agriculture, 99% of Japanese agriculture, 75% of Brazilian agriculture, and 91% of Chinese agriculture. Some of the major milestones which

countries are striving to achieve in agriculture sector are –

- a) Despite the fact that geography of Israel is not naturally conducive to agriculture with semi-arid topography. Israel is a major exporter of fresh produce and a world-leader in agricultural technologies. It is innovative - in use of resources; maximum yields on limited land and maximizing water conservation. Israel’s known for their irrigation system mostly the ‘drip irrigation’.
- b) Japan’s Agri-tech business are marketing a wide variety of products and services for meeting industry demands and the nation saw generally increased productivity, lower costs, use less resources such as water and pesticides, and improve product quality and availability.
- c) Turning deserts sand into farmland; Chinese scientists proposed a revolutionary solution to desertification. This is an eco friendly attempt to transform dead deserts into thriving ecosystems and fertile lands. Flowers and vegetables are growing in nearly 500 acres of sand with new technology.

The given table shows that although India and china are the major producers of most of the agricultural produce, but they are not able to export much since they are utilized for domestic consumption.

Table No. 1, Countries with highest exports and their agricultural statistics

Sl. No.	Country	Export (in billions \$)	Labor employed (% of total population in 2018)	Contribution to GDP
1	United States	\$ 118.3	1.63	1.05
2	Netherlands	\$ 79	2.16	1.86
3	Germany	\$ 70.8	1.26	0.63
4	France	\$ 68	2.82	1.51
5	Brazil	\$ 55.4	10.16	4.57
*	China	\$ 96.60	16.45	14
**	India	\$ 33.87	41.61	17.32

Source: Employment in agriculture (%), ILOSTAT database, investopedia, media sources

Use of e-Technology in Indian agriculture sector

The ambitious mission of the government- ‘Digital India’ was launched on July 1, 2015 to create digital infrastructure. One of its major aims was

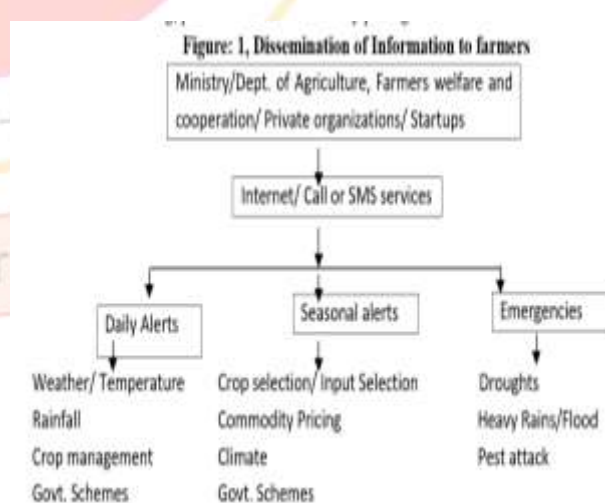
empowering rural communities, enabling digital delivery of services and promoting digital literacy in rural areas. Given that 68 per cent of India’s population is rural and agriculture is the main source of livelihood for 58 per cent of the population.

New technologies such as Biotechnology, information and communication technology (ICT), renewable energy technology, space applications and Nano-technology are approaching towards farming and agriculture sector to enhance agriculture productivity per unit of land. The e-technology can be used for the following purpose-

- Information to farmers on seeds, fertilizers, pesticides.
- Information to farmers on Govt. Schemes.
- Information to farmers on Soil recommendations.
- Information on crop management.
- Information on weather and marketing of agriculture produce.

Shifting weather patterns such as increase in temperature, changes in precipitation levels, and ground water density can affect farmers, but leveraging e-technology can predict and lessen the adversaries for sowing, pest control and commodity pricing.

Figure: 1, Dissemination of Information to farmers



Recent prospects of e-Technology in agriculture sector

- a. Historic climate data spanning over 30 years from 1986 to 2015 for Devanakonda mandal (Tehsil) in Andhra Pradesh was analyzed to calculate the crop-sowing period, using Artificial Intelligence (AI). And

to determine the optimal sowing period, the Moisture Adequacy Index (MAI) was calculated.

- b. Microsoft and its collaborative partner International Crops Research Institute for Semi-Arid Tropics (ICRISAT) developed an AI Sowing App powered by Microsoft Cortana Intelligence Suite, guided the farmers of Andhra Pradesh and Karnataka about the optimal date for sowing groundnut crops. The SMS was delivered in native languages; Telugu and Kannada. For this farmers only need a feature phone capable of receiving text messages.
- c. The farmers in the villages of Telangana, Maharashtra and Madhya Pradesh are receiving automated voice calls that tell them whether their cotton crops are at risk of a pest attack, based on weather conditions and crop stage.
- d. The government of Karnataka can get price forecast for essential commodities three months in advance for planning the Minimum Support Price (MSP). Thus, this kind of innovation had seen a successful price checking mechanism.
- e. In Karnataka, Artificial rain (Project Varshadhare) through cloud-seeding technique has been made possible to provide relief to the drought-hit areas due to failure of monsoon in 2016-17. Thus, with the use of technology, it has become possible to minimize the risks involved in agriculture.

Alternative farming Methods

There are other alternative farming's which can play a key role in transforming the Indian agriculture and increase farms productivity along with profitability.

Organic farming: A method of farming system which primarily aimed at raising crops by use of organic wastes (crop, animal and farm wastes, aquatic wastes), biological materials & beneficial microbes (Bio fertilizers) to release nutrients to crops for increased sustainable production in an eco friendly manner with minimum pollution. Organic farming is based on the principle of maximum production without affecting the soil fertility and environment. Sikkim is the state where organic farming is flourishing compared to rest of the country.

Precision agriculture: Precision agriculture or Satellite farming is farming management concept that uses information technology (IT) to ensure that the crops and soil receive exactly what they need for

optimum health and productivity. Geographic Information System (GIS) is extensively used in Precision agriculture. The global market for precision agriculture is expected to grow at an annual growth rate of 13.09% to reach a market size of over US\$6.34 billion by 2022.

Smart farming: SF involves the incorporation of modern technologies such machinery, equipment, and sensors to increase quality and quantity of agricultural products. New technologies such as the artificial intelligence, Internet of Things and cloud computing are expected to advance farming. Smart farming allows a large volume of data and information to be generated with progressive insertion of automation into agriculture process.

Government steps to provide e-aid to farmers-

Under the National Telecom policy, 2012 major focus is being given at improving the broadband penetration. It mentions mobiles as an instrument of socio-economic empowerment for citizens. Some of the major schemes for encouraging e-Technology are-

Kisan Call centre: An expert advisory system where in the farmers needs to call the toll free number 1800-180-1551 to seek expert advice on different matters related to agriculture and allied sectors.

Pradhan Mantri Gramin Digital Saksharta Abhiyaan: The scheme to make six crore persons in rural areas, across India digitally literate, reaching to around 40% of rural households by covering one member from every eligible household by 31st March, 2019. **Website-** <https://www.pmgdisha.in>

mKISAN: mKisan SMS Portal has been devised to give a information on crop production, horticulture, animal husbandry, dairying and fisheries to farmers through SMS messages. It sends messages relating production, marketing, weather forecast, soil testing, etc. **Website-** <http://mkisan.gov.in>

Soil Health Cards: It aims at promoting Integrated Nutrient Management (INM) through judicious use of chemical fertilizers including secondary and micro nutrients in conjunction with organic manures and bio-fertilizers for improving soil health and its productivity. **Website-** <http://www.soilhealth.dac.gov.in>

eNAM: eNational Agriculture Market (eNAM) is a pan-India electronic trading portal which

networks the existing Agriculture Produce Marketing Committee (APMC) mandis to create a unified national market for agricultural commodities.

Website- <http://www.enam.gov.in/NAM>

Kisan Suvidha Portal: Kisan Suvidha is an omnibus mobile app developed to help farmers get relevant information instantly. The app provide information on various details such as weather, market prices, seeds, fertilizers, pesticides, agriculture machinery, dealers, agro advisories, plant protection and IPM practices etc. **Website-** <http://www.kisaansuvidha.com>

Government e-Market Place: Government e-Marketplace (GeM) is single window solution for online procurement of common use Goods & Services required by various Government Departments/Organizations and PSUs. **Website** - <https://gem.gov.in>

Problems in effective use of Technology

Literacy and basic digital literacy hinders the development of e-Agriculture, and this creates a digital divide.

Technical feasibility of connectivity in rural areas since the reach of technology is not uniform throughout the country.

Farmers are unable to furnish the collateral that most financial institutions require to undertake the loan for buying machinery and equipments.

The vast majority of Indian startups are urban centric. The rural infrastructure for the use of ICT is also not uniform and lot of regional disparity.

Suggestions

- A national strategy needs to be drawn for spearheading IT penetration to rural India. A national coordinating agency with an advisory role can act as a catalyst in the process.
- Information and communication technology can help farmers became more productive and get better access to market Information, financing, and other facilities and services.
- Building farmers resilience to environmental shocks such as extreme drought and floods can be possible through e-technology and AI, which needs to be strengthened across states.
- Special counseling and interaction with agri-experts, officers and stake holders with regular intervals at gram panchayat level will enhance confidence of the farmers in decision making.

- Information to farmers about crop rotation, community farming, weather patterns, fertilizers use and going organic at regular intervals will benefit them.

Conclusion

The use of technology has reduced the risk factors in agriculture and has reduced farmer's dependency and vulnerability to the nature. The advancement in technology has introduced improved productivity through time management and proper planning. India needs to adopt the role of e-technology in order to utilize maximum advantage from agriculture. The present study focused on studying the role of e-technology but the poor farmers are away from proper information and lacks decision making.

References

1. Agri Tech India (2019) 11th edition India's Largest Exhibition on "Agriculture, Farm Machinery, Dairy, Poultry, Livestock Equipment & Agri Processing Technologies" 30th Aug - 01st Sep 2019, BIEC, Bangalore, India.
2. Seth and Ganguly (2017) "Digital Technologies Transforming Indian Agriculture", - Jubilant Bhartia Food and Agriculture Centre of Excellence (FACE) Confederation of Indian Industry [PDF] > <https://www.wipo.int/edocs/pubdocs>.
3. Abdul Rehman et al. (2016) "Modern Agricultural Technology Adoption its Importance, role and usage for the improvement of Agriculture", American- Eurasian Journal, Agri and Environment Science, 16(2): 284-288, 2016, ISSN 1818-6769.
4. Pradhan L, Mohapatra B (2015), "E-agriculture: A Golden Opportunity for Indian Farmers", International Journal of Research and Development - A Management Review (IJRDMR), ISSN (Print): 2319-5479, Volume-4, Issue-1
5. Mittal S.C. (2012) "Role of Information Technology in Agriculture and its Scope in India" [PDF], Management Services Division Limited, 34, Nehru Place, New Delhi-110019
6. Bibhu Santosh Beheraa et al. (2015) "E-Governance Mediated Agriculture for Sustainable Life in India", International Conference on Intelligent Computing, Communication & Convergence (ICCC-2014) > Procedia Computer Science 48, Page no. 623 - 629.

7. Abdul Rehman, Luan Jingdong, Rafia Khatoon and Imran Hussain
8. Abdul Rehman, Luan Jingdong, Rafia Khatoon and Imran Hussain
9. Modern Agricultural Technology Adoption its Importance Sahoo, R.N. (2010) "*Geo informatics for Precision Agriculture*" Lecture delivered in FAI Workshop on 'Fertiliser Reform through ICT'14-17 at Kufri, Shimla Inter-governmental Panel on Climate Change (IPCC), 2007, Cambridge University Press, U.K.
10. Ghogare et al. (2015) "*E-Agriculture*" *Introduction and Figuration of its Application*" International Journal of Advanced Research in Computer Science and Software Engineering 5(1), January - 2015, pp. 44- Volume 5, Issue 1, ISSN: 2277 128X.

