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- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–23

UNPUBLISHED DISSERTATIONS

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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WEBSITES

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DIGITALISATION: AGRICULTURE WITH A NEW PERSPECTIVE**RAMESH AJMEERA****LECTURER****UNIVERSITY COLLEGE OF COMMERCE & BUSINESS MANAGEMENT****KAKATIYA UNIVERSITY****WARANGAL****ABSTRACT**

Agriculture is the most important sector of the Indian Economy. The Indian agriculture sector accounts for 18 percent of India's gross domestic product (GDP) and employs 50% of the countries workforce. India is the world's largest producer of pulses, rice, wheat, spices, and spice products. India has many areas to choose for business such as dairy, meat, poultry, fisheries, and food grains, etc. India has emerged as the second-largest producer of fruits and vegetables in the world. Total food grain production India is estimated at 281.37 million tonnes during 2018-19 as compared to 277.49 million tonnes in the previous fiscal. This is higher by 15.63 million tonnes than the previous five years' (2013-14 to 2017-18) average production of food grains, according to second advance estimates released by the Department of Agriculture. This is a good symptom for the Indian economy from the agriculture sector. The social transformation of the country and economic growth depends on the performance of the agriculture sector. In the recent past, the per-capita agricultural output has seen a steady rise, but the sector's contribution to the GDP has been decreasing. The deceleration in agricultural growth is the major challenge faced by the so-called agrarian Indian economy. The reasons for the deceleration are many like lack of public investment in research and development and irrigation, inefficiency in providing inputs, rural credit and extension services, land fragmentation, outdated tenancy law, lack of modern market and rural infrastructure, inappropriate input pricing policies, etc. Under such circumstances, the concept of Digitization of the Agricultural Sector becomes more vital. There is a necessity of empowering the rural community by creating digital Infrastructure, providing various digital services, and Promoting digital literacy. Digitization in Agriculture can be defined as ICT and data ecosystems to support the development and delivery of timely, targeted information and services to make farming profitable and sustainable. The distinct vision of our Prime Minister assures regarding several initiatives taken to provide "Protective shield" to the farmers to increase production, improve storage and connectivity with the consumers for better supply and profit. This paper intends to explore the initiatives taken by Government for providing Digital Infrastructure and decision support systems to the farmers, impact of Digital India on rural areas and also to study how it would result in improving the income of the farmers.

KEYWORDS

ICT, digital infrastructure, agriculture, rural empowerment.

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INTRODUCTION

Agriculture is the primary source of livelihood for about 58 percent of India's population. Gross Value Added by agriculture, forestry, and fishing is estimated at Rs 18.53 trillion (US\$ 271.00 billion) in FY18. The Indian food industry is poised for huge growth, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. The Indian food and grocery market is the world's sixth-largest, with retail contributing 70 percent of the sales. The Indian food processing industry accounts for 32 percent of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. It contributes around 8.80 and 8.39 percent of Gross Value Added (GVA) in Manufacturing and Agriculture respectively, 13 percent of India's exports and six percent of total industrial investment.

INVESTMENTS

According to the Department for Promotion of Industry and Internal Trade (DPIIT), the Indian food processing industry has cumulatively attracted Foreign Direct Investment (FDI) equity inflow of about US\$ 8.57 billion between April 2000 and December 2018. Some major investments and developments in agriculture are as follows:

- Investments worth Rs 8,500 crore (US\$ 1.19 billion) have been announced in India for ethanol production.
- By early 2019, India will start exporting sugar to China.
- The first mega food park in Rajasthan was inaugurated in March 2018.
- Agrifood start-ups in India received funding of US\$ 1.66 billion between 2013-17 in 558 deals.
- In 2017, the agriculture sector in India witnessed 18 M&A deals worth US\$ 251 million.

ACHIEVEMENTS IN THE SECTOR

- Sugar production in India has reached 27.35 million tonnes (MT) in 2018-19 sugar season, as of March 15, 2019, according to the Indian Sugar Mills Association (ISMA).
- The Electronic National Agriculture Market (eNAM) was launched in April 2016 to create a unified national market for agricultural commodities by networking existing APMCs. Up to May 2018, 9.87 million farmers, 109,725 traders were registered on the e-NAM platform. 585 mandis in India have been linked while 415 additional mandis will be linked in 2018-19 and 2019-20.
- Agriculture storage capacity in India increased at 4 percent CAGR between 2014-17 to reach 131.8 million metric tonnes.
- Coffee exports reached a record of 395,000 tonnes in 2017-18.
- Between 2014-18, 10,000 clusters were approved under the Paramparagat Krishi Vikas Yojana (PKVY).
- Between 2014-15 and 2017-18 (up to December 2017), the capacity of 2.3 million metric tonnes was added in godowns while steel silos with a capacity of 625,000 were also created during the same period.
- Around 100 million Soil Health Cards (SHCs) have been distributed in the country during 2015-17 and a soil health mobile app has been launched to help Indian farmers

REVIEW OF LITERATURE

Saravanan, R (2010) Integration of new Information and Communication Technologies (ICTs) are rapidly transforming the agricultural extension. The ICT enabled extension systems are acting as a key agent for changing the agrarian situation and farmers' lives by improving access to information and sharing knowledge. ICT based agricultural extension brings incredible opportunities and has the potential of enabling the empowerment of farming communities. Extension practitioners

are excited to experiment with innovative ICT initiatives. Experiences on "ICTs for Agricultural Extension" initiatives are showing encouraging results and also complementing conventional extension communication methods. At the same time, it is also a challenge to place rural ICT infrastructure, developing appropriate content, ensuring sustainability and scaling-up. This study is an attempt to document the National Policy on ICTs in agricultural extension, ICT infrastructure scenario and related issues, case studies on innovative ICTs for agricultural extension initiatives (Village knowledge centers, information kiosks, mobile ICT units, web portals, digital database and networks, rural telecentres, farmer call centers, mobile telephony, videoconference, offline multimedia CDs, decision support systems, expert systems, innovative community radio and television programmes, open distance learning etc.), lessons and way forward in the countries.

Multani Sukhvinder Kaur (2007) in his research study entitled 'ICT in Rural Development' concludes that the 21st century is the age of Information and Communication Technology and ICT plays a vital role in political, economic and socio-cultural development of a country. ICT is of immense significance in our lives. It has become a powerful tool towards empowering rural masses by way of access to information related to education, banking, employment, agriculture, governmental resources, and services. However, certain sections of society are deprived of their usage. This has led to what is called the 'digital divide'. There have been attempts across countries to reduce this digital divide and make the marginalized sections, especially the rural masses, have access to ICT. In addition to providing opportunities to rural masses, ICT also faces some challenges in its implementation. These challenges are difficult yet 79 manageable. Because of the opportunities and challenges mentioned, there is a need for interaction between the private and the public sectors to optimally utilize their respective expertise and abilities in the area of rural development.

P. Syama Thrimurthy (2009) published a research article entitled "Information communication technology for rural areas". In this paper, an attempt is made to present the importance of ICT, initiatives on the use of ICT for rural areas, the challenges that are to be faced in implementing the ICT based solutions. Having presented that capability approach, finally, we have presented the successful implementations in different States & Union territories for a variety of ICT based applications for improving employment generation, agriculture counseling, entrepreneurial activity and market access to education and knowledge, addressing health challenges, rural empowerment & participation, social empowerment of women, good governance and several others. This helps in understanding the positive aspects of using ICT for rural areas and to know the experiences of different applications that improve the quality of rural life.

Robert Chapman and Tom Slaymaker (2002) This paper investigate the role that information and communication technologies (ICTs) have to play in developing countries, focusing particularly on those rural areas that are currently least affected by the latest advances in the digital revolution'. Section one aims to look beyond the current 'digital divide' debate which focuses on information disparities to assess the potential role of ICTs in the context of current rural development paradigms. This section addresses the current divergence between the technology drivers and the potential beneficiaries in rural areas in developing countries, together with the opportunities arising from the continued convergence of ICTs, old and new. The section considers some alternative approaches that are being pioneered to harness ICTs for development goals including the private sector, public sector, and NGO-based initiatives. This leads on to a discussion of changing approaches to technology transfer drawing on lessons from agricultural extension experience to illustrate how ICTs could be harnessed for rural development.

David J. Grimshaw and Shalini Kala (2011) The report Strengthening Rural Livelihoods: The impact of information and communication technologies in Asia looks at the use of information communications technologies (ICTs) in facilitating rural development by providing agricultural extension services and real-time market price information, connecting rural laborers with wage-earning opportunities and helping rural communities build a sustainable asset base. The study shows how ICT interventions have "empowered rural people and transformed livelihoods in agriculture by filling information gaps, raising awareness, building skills and extending social networks". Appropriate for both experts and newcomers to the field of development, this well-written and comprehensive report contribute greatly to the understanding of how ICTs influence rural livelihoods.

Sudhir Kumar Sharma, Vandana Lama and Nidhi Goyal (2015) proposed the objective to have a vision on the Digital India campaign where technologies and connectivity will come together to make an impact on all aspects of governance and improve the quality of life of citizens. This initiative will ensure that all government services and information are available anywhere, anytime, on any device that is user-friendly and secured. The authors aim at providing Digital infrastructure as a utility to every citizen i.e. to deliver high-speed communication technologies, Governance, and Services on Demand i.e. every government services or information is available online and on mobile platforms with a single touch and Digital Empowerment of Citizens i.e. every citizen will empower through digital literacy and universal access to digital resources.

OBJECTIVES OF THE STUDY

1. To identify the problems existing in the Agricultural economy in India
2. To analyze the impact of Digitization on Agriculture
3. To study the digital Initiatives by the government to address the farmer's problem.
4. To Study the Future impact on digitization on Agriculture.

RESEARCH METHODOLOGY OF THE STUDY

This Study is completely based on the Secondary sources of data. The data for this study is collected from journals, magazines, newspapers, published articles and government websites.

IDENTIFIED PROBLEMS IN THE AGRICULTURE SECTOR

The agriculture sector challenges will be important to India's overall development and the improved welfare of its rural poor. The identified problems are as stated below:

1. Instability: Agriculture in India largely depends on monsoon. As a result, the production of food-grains fluctuates year after year. A year of abundant output of cereals is often followed by a year of acute shortage. This, in turn, leads to price income and employment fluctuations. However, for the thirteen years, in successive (1987-88 to 1999-00) a normal monsoon has been observed.

2. Cropping Pattern: The crops that are grown in India are divided into two broad categories: food crops and non-food crops. While the former comprises food-grains, sugarcane, and other beverages, the latter includes different kinds of fibers and oilseeds. In recent years there has occurred a fall in agricultural production mainly due to a fall in the output of non-food articles. Moreover, rabi production has become as important as Kharif production in the late 1990s. In 1999-2000, for example, of the total grain production of 209 mn. tones, rabi accounted for 104 mn. tones. This indicates a structural change in agricultural production.

3. Land Ownership: Although the ownership of agricultural land in India is fairly widely distributed, there is some degree of concentration of landholding. Inequality in land distribution is also because there are frequent changes in land ownership in India. It is believed that large parcels of land in India are owned by a relatively small section of the rich farmers, landlords, and money-lenders, while the vast majority of farmers own very little amount of land or no land at all. Moreover, most holdings are small and uneconomic. So the advantages of large-scale farming cannot be derived and cost per unit with 'uneconomic' holdings is high, output per hectare is low. As a result, peasants cannot generate a sufficient marketable surplus. So they are not only poor but are often in debt.

4. Sub-Division and Fragmentation of Holding: Due to the growth of population and breakdown of the joint family system, there has occurred a continuous sub-division of agricultural land into smaller and smaller plots. At times small farmers are forced to sell a portion of their land to repay their debt. This creates further sub-division of land. Sub-division, in its turn, leads to fragmentation of holdings. When the size of holdings become smaller and smaller, cultivation becomes uneconomic. As a result, a major portion of land is not brought under the plow. Such sub-division and fragmentation make the efficient use of land virtually impossible and add to the difficulties of increasing capital equipment on the farm. All these factors account for the low productivity of Indian agriculture.

5. Land Tenure: The land tenure system of India is also far from perfect. In the pre-independence period, most tenants suffered from insecurity of tenancy. They could be evicted at any time. However, various steps have been taken after Independence to provide security of tenancy.

6. Conditions of Agricultural Labourers: The conditions of most agricultural laborers in India are far from satisfactory. There is also the problem of surplus labor or disguised unemployment. This pushes the wage rates below the subsistence levels.

7. The Systems and Techniques of Farming:

(a) Neglect of crop rotation: Successful conduct of agricultural operations depends upon a proper rotation of crops. If cereals are grown on a plot of land its fertility is reduced to some extent. This can be restored if other crops such as pulses are grown on the same plot on a rotational basis. Most farmers in India are illiterate and do not understand this important point. Since they are not aware of the need for crop rotation they use the same type of crop and, consequently, the land loses its fertility considerably.

(b) Inadequate use of manures and fertilizers: Inadequate use of manures like cow-dung or vegetable refuse and chemical fertilizers makes Indian agriculture much less productive than Japanese or Chinese agriculture.

(c) The use of poor quality seeds: In India, not much use has been made of improved varieties of seeds. The main cereals (rice, millets, and pulses) are still grown chiefly with unimproved seeds.

(d) Inadequate water supply: Farmers also suffer due to lack of irrigation facilities. Moreover, ordinary varieties of seed can be replaced by better varieties if there is an assured supply of water. The need for the construction of minor irrigation works of a local nature is both urgent and pressing. The total water potential in the country is more than adequate to irrigate the whole areas under cultivation. However, the present problem is one of discovering cheap and easy methods of utilizing these vast supplies of water.

(e) Inadequate use of efficient farm equipment: The method of cultivation in most areas of India is still primitive. Most farmers continue to use native plow and other accessories. However, the problem is not one of a shortage of modern machinery. The real problem is that the units of cultivation are too small to permit the use of such machinery.

8. Agricultural Marketing: One of the major causes of low income of the Indian farmers is the difficulty in marketing their crops. Due to the small size and scattered nature of agricultural holdings, the productivity per acre is low. Consequently, the collection of these surpluses for marketing presents a serious problem.

Agricultural marketing problems arose due to the lack of communications, i.e., connecting the producing centers with the urban areas which are the main centers of consumption. The difficulty of communication prevents the farmer from marketing his produce. So he has to rely on several middlemen (intermediaries) for the disposal of "his crops at cheap prices.

9. Agricultural Credit: The typical Indian farmer is almost always in debt. The farmer is a perennial debtor. Once the farmer falls, into debt due to crop failure or low prices of crops or malpractices of moneylenders he can never come out of it. A large part of the liabilities of farmers is 'ancestral debt'. Thus, along with his landed property, he passes on his debt to his successors. There are four main causes of rural indebtedness: Low earning the power of the borrower, Use of loan for unproductive purposes, the excessively high rate of interest charged by the moneylenders and the manipulation of accounts by the lenders.

10. Agricultural Prices: To increase food production, it is necessary to ensure that prices of Food-grains set by the Government from time to time give sufficient incentives to farmers so that they can earn reasonable incomes. In India, bumper crop leads to a fall in revenue of farmers.

11. Need for price stabilization: Because of the rising and fluctuating trends in agricultural prices, there is a need for stabilization of prices of agricultural commodities. Price fluctuation in any direction may spell disaster since both rising and falling prices have had harmful consequences.

DIGITAL INDIA PROJECT AND AGRICULTURE

Government's "Digital" project launched on 1st July 2015 envisions empowering citizens with e-access to government services and livelihood related services, among others. The project has three core components, viz. digital infrastructure, digital services, and digital literacy. The mobile phone is the preferred delivery medium with a focus on mGovernance and mServices. The mAgriculture and mGramBazar, out of the seven components covered under mServices, directly impact agricultural extension and marketing services. The project will benefit small farmers. It seeks to:

- (i) Transform rural India into a digitally-empowered knowledge economy.
- (ii) Provide universal phone connectivity and access to broadband in 250,000 villages.
- (iii) Extend timely services to farmers through information technology and its tools (iv) Enhance efficiency in agricultural governance through digital literacy and electronic delivery of services.

LOW CROP PRODUCTIVITY & PROFITABILITY

According to "Situation Assessment of Indian Farmers", only about 28% of all farmers use any kind of agriculture-related information that is available rather than *what they need*. While about 72% of farmers do not have any source of information that can help them adopt the latest technology, most farmers are unable to access credit, insurance and marketing services from the established institutions. This is primarily responsible for farmer's low crop productivity and profitability. Despite India has the largest irrigated land and ranks second in terms of arable land the yield crops are 20%-40% of the world's best levels.

POTENTIAL OF ICT

Information and Communication Technology (ICT) has the potential to revolutionize Indian agriculture in terms of raising crop productivity and profitability per unit area and resources. By June 2014, rural India had about 122.4 million [68.32%] households with mobiles exhibiting mobile connectivity has become a basic service in rural areas. The rural mobile subscriber base is growing twice as faster compared to the urban subscriber base. As of March 2015, the national teledensity was 79% and rural teledensity 46.5%. Telecom Policy aims to increase rural teledensity to 60% by 2017 and 100% by 2020. The study of the IAMAI revealed 80% using it for communications, 67% for online services, 65% for e-commerce and 60% for social networking. Mobile phones can be effectively utilized for purposes including generating, processing, transmitting, disseminating, sorting, archiving and retrieving critical information and data relating to agriculture. Mobile phones are omnipresent and cost-effective means to revolutionize agriculture in India. Several apps are now available and many more can be developed to meet farmers following specific needs. For India, at a time when national, regional and international research institutes have already developed technologies, farmers need motivation and encouragement to adopt this proven yield-enhancing, cost-efficient, and environment-friendly technologies. Acknowledging the slow impact of the ICT initiatives of the government and private sector, the digital India project should pay undivided attention to provide accurate information from authentic sources to farmers on time on various aspects as identified by various field studies, viz.

- (i) details of location-specific crop production technology
- (ii) Economics of crop, livestock and fish farming
- (iii) Authorized sources of timely availability of standard quality inputs [seeds, fertilizers, pesticides, etc.] farm equipment, sprinklers, drippers, among others, along with costs
- (iv) Post-harvest management technology and facilities including transport, storage, processing, preservation, packaging, and marketing
- (v) Commodity prices, weather, measures to minimize the impact of drought and climate change
- (vi) The detailed procedure for availing bank credit, crop and livestock insurance cover, government subsidies, land records, etc.
- (vii) Government's programs providing subsidy and other facilities to develop irrigation potential, rainwater Harvesting, soil and water conservation measures, soil and water testing facilities, prevention and control of pests and diseases, bio-gas, minimum support prices
- (viii) Contract farming, value chain system, warehouse receipt

Accordingly, farmers need ICT-enabled portals for the following purposes which can be developed, rigorously field-tested and made available to farmers.

Technology: Production-enhancing has proven crop-specific technologies [from pre-sowing to harvesting and post-harvest management] based on soil & water analysis. Separate for dryland & irrigated farming focusing efficient use of seeds, fertilizers, water, pesticides, farm equipment & labor; and reclamation of degraded, saline & alkaline land.

- **Production inputs & farm equipment:** Crop-specific reasonably priced standard quality production inputs [seeds, fertilizers, pesticides, etc.] and farm equipment and machinery along with sources of availability

- **Post-harvest services:** Storage, transport, processing, packaging
- **Institutional services:** Land records, farm credit, insurance, marketing, weather, farmer-producers' organizations, market yards, procurement centers
- **Government facilities:** Availability of subsidies, assistance available to mitigate effects of climate change, drought, floods, earthquake, cyclones.

Institutions: State government's department of agriculture, state agricultural universities, Krishi Vigyan Kendras, regional research institutes, farmer-producers organizations, corporate/industrial/business houses and multinational companies engaged in manufacturing/production and distribution of farm inputs, farm equipment & machinery, rural financial institutions, insurance companies, among others, have a significant role and added responsibility to contribute their professional knowledge to develop digital ecosystem for agriculture and make available to farmers.

GOVERNMENT INITIATIVES

Some of the recent major government initiatives in the sector are as follows:

- Prime Minister of India, launched the Pradhan Mantri Kisan Samman Nidhi Yojana (PM-Kisan) and transferred Rs 2,021 crore (US\$ 284.48 million) to the bank accounts of more than 10 million beneficiaries on February 24, 2019.
- The Government of India has come out with the Transport and Marketing Assistance (TMA) scheme to provide financial assistance for the transport and marketing of agriculture products to boost agriculture exports.
- The Agriculture Export Policy, 2018 was approved by the Government of India in December 2018. The new policy aims to increase India's agricultural exports to US\$ 60 billion by 2022 and US\$ 100 billion in the next few years with a stable trade policy regime.
- In September 2018, the Government of India announced Rs 15,053 crore (US\$ 2.25 billion) procurement policy named 'Pradhan Mantri Annadata Aay SanraksHan Abhiyan' (PM-AASHA), under which states can decide the compensation scheme and can also partner with private agencies to ensure fair prices for farmers in the country.
- In September 2018, the Cabinet Committee on Economic Affairs (CCEA) approved a Rs 5,500 crore (US\$ 820.41 million) assistance package for the sugar industry in India.
- The Government of India is going to provide Rs 2,000 crore (US\$ 306.29 million) for computerization of the Primary Agricultural Credit Society (PACS) to ensure cooperatives are benefitted through digital technology.
- Intending to boost innovation and entrepreneurship in agriculture, the Government of India is introducing a new AGRI-UDAAN program to mentor start-ups and to enable them to connect with potential investors.
- The Government of India has launched the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) with an investment of Rs 50,000 crore (US\$ 7.7 billion) aimed at the development of irrigation sources for providing a permanent solution from drought.
- The Government of India plans to triple the capacity of food processing sector in India from the current 10 per cent of agriculture produce and has also committed Rs 6,000 crore (US\$ 936.38 billion) as investments for mega food parks in the country, as a part of the Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters (SAMPADA).
- The Government of India has allowed 100 percent FDI in the marketing of food products and food product e-commerce under the automatic route.

FOCUSED ATTENTION

- The immediate need is to conduct a nation-wide [separately for each agro-ecological region] evaluation study to assess the impact of ICT initiatives on agriculture already developed and put in place by the government and private sector in respect of
 - [a] number of farmers regularly receiving & using mobile-enabled agricultural information services
 - [b] Feedback from users about content, timeliness, utility, satisfaction, changes required, their grievances
 - [c] Increase in productivity, output, and income of benefitted farmers
 - [d] Increase in price realization in farm commodities sold, direct selling without dependence on middlemen
 - [e] Reduction in costs of transactions
 - [f] Mechanism to redress grievances.
- For successful designing digital ecosystem for agriculture, the system design should have all desired features of higher user satisfaction, viz. ease of access, updated content, layout, design, consistent themes, easy navigation, higher interactivity, access through multiple media (particularly voice), higher use of non-textual information, language options and lower cost of transaction.
- Regulatory & Development Authority needs to be in place to ensure
 - [a] increase in farmers' easy, timely and reliable access to agricultural information system [as per farmers' needs] throughout the country in a systematic & planned manner
 - [b] Development of need-based appropriate digital models for agriculture under the public & private sector which conform BIS & available at affordable cost
 - [c] Improving general and digital literacy and computer skill and digital infrastructure in rural India in line with digital India vision
 - [d] Prevention of fake models and fraudulent practices

ROLE OF DIGITAL AGRICULTURE

- 1) Improving Agricultural Production:** Farmers (especially small ones) often face problems from many threats to soil quality, drought, erosion, and pests. ICT can help improve this by providing up-to-date information on pest and disease control, early warning systems, new types, new ways to optimize production, and regulations for quality control.
- 2) Improving Market Access:** Providing up-to-date information on commodity market prices, inputs, and consumer trends. This will improve the farmers' negotiating position and their livelihood, while at the same time enabling farmers to make better decisions about future crops and commodities and is the best time and place to sell and buy goods.
- 3) Capacity-building and empowerment:** To strengthen the communities and to help farmers enterprises strengthen their capacity and better represent their constituencies while negotiating input and output prices, land claims, resource rights, and infrastructure projects. Rural communities can communicate with others through the use of ICTI, which reduces the social isolation they face. Also, ICT technologies can make procedures more transparent in creating law and land-title approvals.

CONCLUSION

Thus, it can be concluded that the technology platform will bring the desired results in the agriculture sector such as reduced costs, improved productivity and quality, better prices, reduced risks and ultimately a sustainable ecosystem. ICTs are now acting as an agent to improve farmer life by improving access to information and sharing knowledge. ICT tools can change farmers' ideas, activities, and knowledge. Farmers can feel empowered and take appropriate actions when necessary. Indian agriculture is very advanced and has made much advancement in terms of production and productivity. Prospects need to adapt to this changing digital world to overcome the above challenges and lead to increased efficiency in the production, distribution, and consumption of agricultural products.

REFERENCES

1. David J. Grimshaw and Shalini Kala (2011) – Strengthening Rural Livelihoods: The impact of information and communication technologies in Asia - Practical Action Publishing Ltd., UK, and the International Development Research Centre, Canada.
2. P. Syama Thrimurthy (2009) “Information communication technology for rural areas” – Edited by P Adinarayan Reddy – Science and Technology for Rural development – The Associated Publishers, New Delhi.
3. Robert Chapman and Tom Slaymaker (2002) - ICTs and Rural Development – Overseas Development Institute, London
4. Saima Khan (2015), Digitization and its impact on Economy, International Journal of Digital Library Services, ISSN:2250-1142 (Online), ISSN 2349-302X (Print), Vol.5, Issue 2.
5. Saravanan R. (2010) - ICTs for Agricultural Extension: Global Experiments, Innovations and Experiences, New India Publishing Agency (NIPA), New Delhi.
6. Sudhir Kumar Sharma, Vandana Lama, Nidhi Goyal, “Digital India: A Vision Towards Digitally Empowered Knowledge Economy”- Indian Journal of Applied Research, October-2015.
7. Sukhvinder Kaur Multani, ‘ICT in Rural Development: An Overview’, ICFAI University Press (2007)
8. Tanuja R. Patil, Shamshuddin.K., Rajashekhar Patil, Sadanand P., “Krishi Samridhi: A Decision Support System for Farmers to get High Yield Crops”- International Conference on Computational Techniques in Information and Communication Technologies (ICCTICT), March-2016.

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