

**ICT: A Path towards Rural Empowerment through Telecommunication, E-Governance, and E-Agriculture**

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**ABSTRACT**

India is a land of villages, where 70% population lives in rural community, whose bread and butter is the only agriculture and its allied businesses. Agriculture represents the heart of majority and mainly attracts the social development of our country. Agro-business and agro-economy are much vital as it provides livelihood for majority of population, most contributing to national income, gainful employment. Hence, the study of incredible agriculture sector in e-commerce era is of utmost importance. "ICT" today's buzzword- "Information and Communication Technology" is a huge umbrella term that encompasses all the technologies for the manipulation and communication of information, used for the betterment of mankind. It encompasses various devices, services and applications like Radio, Television, Cellular phones, Computers, Tablets and networking, Hardware and software, Satellite systems. It's a simple logic to enhance the growth and wealth; ICT tools could be adopted in the Agriculture sector to accelerate the growth and automatically growth in national economy. Commonly used and popular ICT tools in rural area are Telecommunication, cellular phones, computers and networks. All are aware of its benefits like-finalizing the decisions at right times, to find best possible solutions, efficient systems for water management, irrigation to increase the max production. As well E-Agriculture for transforming marketing process information, to improve the business and boost the growth. Rural development is also linked with better quality life and it is possible only after providing them timely information, knowledge on commercial aspects. As ICT developed the fastest means and standards, called e-governance, helps the rural population to uplift, as compare to citizens. Updating of rural population in all these three prime areas definitely lead to rural empowerment. With above view, the current research paper highlights the aspects as follows,

1. Growth in rural Telecommunications.
2. Existing ICT programmes on E-Governance.
3. Scope and prospectus of ICT in agriculture sector.
4. Challenges before ICT and Rural empowerment.

**Key Words:** E-governance, E-agriculture, ICT-Information and communication technology, rural empowerment, Telecommunications

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### **Rural Issues and Role of ICT**

India is a land of villages. 70% of our population lives in rural community, where in agriculture and allied businesses are the main sources of income and greatly influenced by our own traditions and customs. Thus Indian rural life is described as a traditional way of life with a) most simplicity, b) poor economic conditions, c) social backwardness, and d) Strong conservatism. It is mainly because of its isolation from the other parts of the society.

Agriculture is the backbone of rural economy, in India. There is a large gap between economic gains and distribution among the rural and urban sector. Majority of population lives in rural area, not fulfilled with basic needs of drinking water, sanitation, health –hygiene issues/medical treatment, transportation, communication, effective government administrative services, lack of technological awareness & modern tools/equipments/facilities for education, farming & supporting agri-business. Practical usage of ICT can be utilized for providing accurate, timely, relevant information & services to the farmers, thereby facilitating an environment for more Remunerative agriculture.(Kurukshetra, Jan.2012,p.2).Needs of rural people are manifold and resources are limited. Hence upliftment of rural community is of high priority, so as to bring them in the main flow of national progress. People's participation is the crux of national development for which the Panchayat Raj system came into existence. And Local self government structure / Panchayat Raj kind of existing administrative set up was utilized for the rapid growth. Also, modern transportation and communication have widened the access of updating information and knowledge of rural people, especially in last two decades. Information Communication Technology (ICT) plays a very crucial role in providing support to business development, decision making, seeking options and taking preventive measures, as per the global market needs. ICT contributed to GDP, in India, from 5.8%, in 1998 to 5.2% in 2007 and 5.8% in 2008(NASSCOM 2009).The top 10 Indian IT companies have generated almost USD 23 billion in annual revenue in 2009. it is almost 36% of overall revenue of IT service industry.(ORCD 2010,IT Outlook, p.32) Thus it indicates the vertical growth of ICT in India, through rising share in GDP, revenue and horizontal growth in reaching the peripheral and remote rural areas. The current research paper attempts to focus upon growth of ICT in rural Indian society and its linkages to Rural Development. It endeavours the efforts

for e-governance and extension of efforts to agricultural schemes, to boost the rural health and economy.

### Objectives

1. To ascertain the growth in rural telecommunications.
2. To focus the existing ICT enabled E-Governance programme.
3. To identify the scope and prospects of ICT in agriculture Sector.

### Methodology

Secondary sources / data are used to explore the fact and figures pertaining to rural communication and development.

Scope of the study is limited to available secondary data.

This study mainly focuses on 3 major areas- namely, telecommunications, E-governance and E-agriculture.

### Telecommunications

Evolution of Indian Telecommunication sector is divided into 3 eras, that is:

1. Pre Liberalization period (before 1991)-marked as solely controlled by Government.
2. Liberalization period (1991-2000) encouraged the voluntarism / private sector which resulted into private partnership in telecommunications and increasing number in telecom service providers.
3. Post Liberalization period (2000 onwards).

New telecom policy 99 played a vital role to develop telecommunications as an industry, with a special concentration on the development of telecom facilities in remote, hilly and tribal areas. The resultant of this (NTP-99) policy and the recent policy has shown the increase in no. of telecom service providers which further lead to rural population, the details are discussed below,

**Table 1:** Service Providers and Coverage of Rural Population

Service Providers and Coverage of Rural Population				
Public Tele Services.		Private Tele Services		
MTNL	BSNL	Bharti Airtel	Reliance Communications	Tata Tele Services-HTD
Cities covered Bombay & Delhi	Coverage of 90% of rural population for the rest	More than 4000 towns & adjoining villages	Covers 4300 towns and claims to have connected all the adjoining villages	Cover 40 secondary switching areas translates to over 200(SDCA) covers rural customer 4.5 cr.

Source-Kurushetra, Jan.2012, p.15

Besides the above private service providers, Idea cellular, Vodafone essar, Aircel, Uninor, HFCL Infotel and others are the notable ones, have reached most of the rural population. Thus, public-private partnership in Telecommunication sector has increased the coverage of rural population. Off course, BSNL is on lead as far as reaching out to remote areas & large rural coverage. Department of Telecommunication's Universal Service obligation fund has recently launched Sanchar Shakti, scheme aiming at providing relevant and quality information to SHG's of rural community. Recently initiated nine projects, a value added mobiles in nine states of India, which would cover 20,000 rural women, are the excellent examples of reaching out to large prime group through ICT. This would provide information on education, health, financial literacy, govt. schemes, and social issues, vocational training and marketing related matters. Thus India has achieved success over traditional knowledge system through ICT.

#### *Telecommunication and E-Governance*

Mobiles and broadband have the power to bring the transformation in the rural lives. Besides mKrishi model, Bharat Nirman Kendras are located in the village panchayats. This would provide, e-government services, telemedicine facilities, distance learning facilities and ICT training facilities. (Archana G. Gulati, Kurukshetra Jan.2012, p.6). Akshaya project of Kerala Government and e-choupal, concerning 35000 farmers which provide information on their mobile services. Product and marketing services to rural people.

#### **E-Governance**

The need for improved computer connectivity up to village level was recognised by central government in 1998 and drafted a national IT policy (IT Action Plan part III, Long Term National IT Plan) which recommended the states to build up the infrastructure so as to facilitate update data communications. As a result rural ICT applications accelerate the communications and co ordination in the areas of district administration, co-operative union, and state and central government departments.

A large no. of e-government applications, developed as pilot projects, were aimed at offering easy access to citizen services and improved processing of govt.-to -citizen transactions. (T.P. Rama Rao, Dec.2004) It not only helps in for the fast communication in the apex body and the local body for the updating data, providing information on schemes and centring the services to rural population, but also it has improved the performance of the government functionary and quick response from the rural people. Transparency and corruption control over the other advantages of the e-governance, which deserves to mention following notable e-governance programmes executed by various state governments of India. KIOSK based approaches to delivering governance, have received considerable attention and funding.

**Table 2: E-Governance Schemes in Different States**

Sr. No.	Name of the State	Name of the Program	Usage by Rural Area
1.	Andhra Pradesh	Saurkaryan: Rajiv project e-seva(paying bills, licences, motor permits & other govt. services)	Vishkha- All district add headquarter, districts of Hyderabad & Secunderabad
2.	Karnataka	Bhoomi-millions of records of land ownership	
3.	Kerala	Akshaya Project importing IT Literacy Akshay Kendra (Payment of electricity bill, birth certificate contact for police station)	8 lack people of various Talukas of Karnataka setup 6000 information centres targeted 6.5 million familiar 13 million people in 12 districts.
4.	Madhya Pradesh	Gyandoot Public grievance redressal	15 to 20 villages of Dhar District 685000 villages various services 41 % usage
7	Rajasthan	Rajnidhi	
8.	Uttar Pradesh Uttranchal	-Lokvani -Jaikissan	
9	Zarkhand- Ranchi	Jharkhand agency for promotion of information Technology(JAP-IT)	e-District for electronic delivery of Citizen centric services, in Ranchi.

Source: Secondary Data

**Table 3: Latest E-governance Programmes Implemented by the Various Government Authorities**

Sr. No.	State	Program	Area Covered
1.	Maharashtra State	Sanganakiya Gramin (SANGRM – Mahaline Ltd. ( implemented at more than 29000 locations) Financial Management & monitoring system for GSWMA Project Funds-Tally Solutions Pvt. Ltd.	For Rural Development & Panchayati Raj. For a) financial reporting processes. b) collectively enabling quick & effective decision making c) Providing information on demand
2.	( C.R.D.) Commissioner of Rural Development	HRMS	To ensure quality services by the department.
3.	District Admin Gwalior & NIC	Janmitra Samadhan Kendra Gwalior	a)Ensuring timely, regular and efficient service b)Bringing admin closer to citizens.

Source: Secondary Data

## **E-Agriculture**

Agriculture was the prime sector in Indian economy in the past. The share of agriculture in the country's GDP has declined from 60% in 1950 to 14.3% in (census) 2011. No doubt the rapid growth of industrialization and service sector are responsible for the decrease of agriculture share in GDP, but at the same time there are several other factors which have given rise to the present situation.

1. These factors are directly affecting on the stagnation of agriculture:

- a) Slow progress in implementing land reforms.
- b) Lack of immediate advisory support to farmers for selection of cropping patterns & insecticides usages.
- c) Lack of access to technical information to field workers.
- d) Inadequate information about marketing services and Poor weather conditions.

2. Knowing these facts, India took an initiative to launch various programmes and schemes with the public and private partnership to reach up to farmers in order to empower them through knowledge ICT. It is the e-agriculture, which refers to the concept -

E-Agriculture is an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes.

E-Agriculture is an emerging ICT field, to transform marketing processes, make business enhancement and to improve the agricultural and rural development.

E-Agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (ICT) in the rural domain, with a primary focus on agriculture. With these specific objectives, India has strived to empower the farmers by way of information and quality decisions through various pilot projects, some of them are mentioned here to understand the scope and challenges before e-agriculture in India.

Indian efforts in this area mainly classified into two areas that is,

The researches /inventions made by the scientists and the execution of programmes under e-agriculture.

### *Inventions for E-agriculture*

- i) It is noteworthy to mention S.C. Mittal who has introduced art technologies as remote sensing, geographical information systems (GIS), bio-engineering. This system has helped a lot for effective monitoring of agricultural conducts. It further aids to plan & execute the crops and quickly respond to crop stress conditions and natural calamities.
- ii) Indian agricultural statistical research Institute has developed a decision support system on nutrient management in crops (Chitra Desai, CSI Communications / Nov.2013, p.19)

iii) One of the remarkable inventions in the field of developing mobile units is made by M.S.Swaminathan Research Foundation to develop a mobile soil and water testing laboratory which reaches the villagers, demonstrates the testing and further provides an advice for the proposed crops and its fertilizers.

iv) P.K. Das has greatly contributed through the probability based model for rainfall prediction, yield-water relationship for major crops, i.e. wheat and rice(P.K.Das 2005,Agricultural Water Management, p.120-138)

Apart from these researches made in agro-products, seeds and fertilizers, water management etc. have also contributed for the knowledge building and enhancement which is disseminated through, ICT among farmers to raise agricultural productivity.

#### *Execution of E-Agriculture Programmes*

The constraints mentioned above, responsible for the declining position of agriculture in the total Indian economy call for the planning and execution of technology in the field of agriculture. As a result, over a period of decade state government NGOs and some pioneering companies have taken up an initiative to launch some pilot projects through various agriculture programmes. Mentioned below are some remarkable ones,

1. PRIDE is Progressive Rural Integrated Digital Enterprise powered by TCS Mkrishi platform, is a patented Mobile Based Personalized Services Delivery Platform that enables two-way data and information exchange the end users such as farmers and field agents and repositories of vital knowledge banks, agriculture experts and procurement officers. Mkrishi is an award winning, rural services delivery platform developed by TCS innovation labs – Mumbai. It is comprised of multiple applications to strengthen the rural agro based enterprise.

2. (source: TCS mKRISHI project at Kanchipuram in Tamilnadu has CHPCL-TNAU Agritech Portal).

TCS Mkrishi Project of Kanchipuram successfully demonstrated Chennai horticulture produce producer companyLtd.-CHPCL is specially for the innovations to be successfully accepted by the target market group, i.e. the rural farmers.CHPCL has incorporated both the innovations into creating a unique solution that can potentially make a significant impact on the industry and hence the large population.(Srini P.,CSI communications Nov.2013)

CHPCL was the fresh experience of TCS to face the farmers and understand their agricultural issues. The link between the farmers at the field and team experts at training centre is established by a liaison i.e. field & building rapport with the farmers. Thus showing mobiles and internet connectivity to computers, it is benefited for generating rural employment, increasing productivity, reducing cost and better timely access to markets and agri inputs.

Once the farmers realized the benefits of innovative practices for increasing agricultural products, technology is introduced through mobiles and internet connectivity to computers.

3. E-Choupal is the another noteworthy example of the private initiative by Indian tobacco corporation(ITC) Ltd, to link directly with farmers for procurement of agricultural / aquaculture produce. It was basically designed to tackle the challenges posed by the unique feature of Indian agriculture, characterised by the fragmented farms, weak infrastructure, and involvement of numerous intermediaries among others (<http://www.youth4kiawaaj.com>). It was launched in June 2000, has reached out to more than 40 lakhs farmers of 40,000 villages across 8 states, named, AP., Karnataka, Maharashtra, Madhya Pradesh, Rajasthan, Tamil Nadu and Uttarakhand. ITC limited plans to cover 100,000/- villages in 15 states reaching to 15 million farmers. The farmer customer of e-choupal benefited in rise in income levels, which is the outcome of rise in yields with low cost investments with quality out puts.

4. Through e-Kutir system in Orissa, farmer can access various resources and knowledge. He can gain maximum yield from his land through efficient resource management. Mostly used in decision making to reduce risk.

5. Annapoorna: Securing Farmers Future

6. MKrishi is a mobile-based service delivery platform for the farmers. This platform is capable of providing personalized advice specific to the subscribers' needs. Right information at right time during farming plays a crucial role for a farmer as it will result in better agricultural production. Farmers need answers for their daily queries on various crop diseases, appropriate quantity of fertilizers/pesticides, best practices for irrigation, etc.

7. United Nations Environment Programme (UNEP)'s “Billion Tree Campaign” which intends to plant one billion trees around Research Projects, Village Adoption Scheme of the Central Agricultural University, Rural Horticultural Work Experience Programme (RHWE).

8. Computer Education and e-Literacy: Regular computer education and e-literacy programmes were conducted for the benefit of tribal children and youth and other villagers in the ten e-Village centres.

9. Rural Horticultural Work Experience Programme-Team created for e-farming awareness, plantation campaign, mushroom cultivation,vermin-compost,Soil sampling & testing, horticulture product processing, landscaping & flower arrangement training at e-village training centre, Environmental Awareness Programmes.C-DAC , Hyderabad and the Central Agricultural University(CAU), College of Horticulture and Forestry, Pasighat, Arunachal Pradesh, jointly implemented a research project called “ Creating Model e-Villages in North East India” e-governance initiative for the agricultural and rural development, since 2008



10. GRAMSEVA: KISAN is a mobile based application that informs the farmers and wholesalers of the current price of commodities. It replaced the conventional web, radio & TV. Models.

After 60 yrs. of independence, more than 700 million population lives in villages of India. Such majority rural population is marked as suffering from poverty, illiteracy, ill health, unemployment & backwardness. Keeping in view these rural features, ICT is highly recommended as a fastest means of progress and most popularly used in integrated development efforts to achieve sustainable rural development. To empower the rural communities with sustainable approach, ICT is the most effective instrument.

ICT's role is crucial in sustainable Rural Growth as follows,

1. Strengthening rural governance.
2. Encouraging social transformation.
3. Ensuring a better quality of Life.
4. Strengthening the information base of rural communities.
5. Intensifying efforts towards implementation of the rural development initiatives.
6. Enhancing people's participation in nation building process. (Anupam Hazra, Kurukshetra, Jan.2012, p.9,10, 11)

Though all citizens in our country are having the right to information, but almost impossible to rural people at grass root level. World of information is based on computers and internet. In rural areas, still traditional systems, which are not so effective, are in existence. Igniting community aspirations and empowering them with appropriate skills for fostering local government that is information based. The only enlightened "Path", helping the rural community to exploit the power of ICT and ICT based economic, governance and social structure. ICT intervention has proved its effectiveness in the sphere of capacity building of rural communities for breaking these barriers. Hence it may be concluded that an integrated framework for ICT interventions in rural areas will unquestionable pave the way towards sustainable rural growth. (Anupam Hazra, Kurukshetra, Jan.2012, p.9,10, 11)

### **Conclusion**

In many of the ICT applications, cloud computing is beneficial, but needs to address challenges, if adopted for agriculture sector. A well planned strategy is required to address the business requirements and technical requirements. The entire Digital Technology designed & adopted for the nationwide e-programmes in communication sector, education sector, agriculture sector, governance services and business sector. Scalability of the innovations cuts across various fronts, on the basis of traditional social systems, economic

and faith systems. Such, basic obstacles to be removed with the help of mass media and value education to the grass root level people.

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