ISBN: 978-93-90847-60-0

5. Role of ICT in Rural Development in India

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Abstract:

Rural development is one of the many elements that affect the economic development of a country. The growing socioeconomic gap between rural and urban areas is exerting significant strain on the social and economic structures of many developing countries. This essay's objective is to assess the need for future improvements to urban and regional planning methods in light of the growth of information and, more especially, the effects of information and communication technology (ICT). Both new and conventional ICTs were used to efficiently deliver information to rural areas. ICTs may provide rural populations a voice and give them the power to participate in development. Rural communities can improve their living conditions and become more motivated to the point where they can make decisions about their own development through education and social interaction. This essay focuses on the issues facing India's rural economy as they relate to ICT. Its main goal is to investigate how technology and/or ICT impact rural development and progress. This essay will discuss the role of ICT in India's rural development.

Keywords:

Economic, Development, Information, Communication, Technology, Rural, People, Agricultural, Backward, Rural Isolation.

5.1 Introduction:

Governments from all over the world are becoming increasingly interested in rural development. India is a country of villages; as a result, the development of the rural inhabitants is associated with that of India. India is the second-most populated nation in the world, yet due to the slow expansion of agricultural employment opportunities, a sizable section of this population experiences economic instability. For two very important reasons, rural development is particularly important in the Indian context.

First off, the majority of people still live in villages, and as long as rural areas lag behind metropolitan ones, progress is difficult. Second, the underdevelopment of the rural sector would provide a considerable challenge to the expansion of the economy as a whole. India has an agrarian economy, and the bulk of the people works in agriculture. The rural sector is significantly underdeveloped in terms of output, social structure, and political mobilization even though rural populations engage in traditional agriculture. The wealth gap has also grown as a result of technical developments in agriculture. [1]

As a result, rural areas are essentially obsolete. The all-India Rural Credit Review Committee stated in their report that "if the fruits of development continue to be denied to the large sections of the rural community, while prosperity accrues to some." "The social and economic tensions may not only sabotage the rural economy's process of orderly and peaceful change, but may even thwart national efforts to establish agricultural production. Therefore, it was judged crucial to establish programs for the distribution of development's benefits to the social strata that reside in underdeveloped and disadvantaged rural areas. As a result, we might draw the conclusion that rural areas usually lack or lag behind urban areas in terms of essential infrastructure and services including transportation, health care, education, and government services. Attempts to achieve inclusive, sustainable growth can suffer from rural poverty and isolation. ICTs are able to work around many infrastructure restrictions. Through ICTs, people in rural areas can connect with the national economy. ICTs can also be used to spread knowledge and solicit input, giving rural citizens a say in the nation's sociopolitical affairs. [2]

Rural and village regions are among those where the development of information technology is necessary. Information technology adoption has a huge impact on rural communities' economic, social, cultural, and political prosperity. Because Indian minds have long been recognized, information and communication technology (ICT) is a well-known service field in the world that India may employ to become a leader. The rural population would be able to actively participate in India's overall growth through the acceleration of rural development, which is essential for the nation to meet its GDP target. Nearly 600,000 villages are located in rural areas, where numerous problems exist and numerous techniques are employed to support rural development. However, none of the policies are now directly addressing the issues of rural communities due to a lack of understanding and awareness. The phrase "information and communication technology" (ICT) refers to a wide range of constantly changing elements, such as computer hardware, software, kiosks, television, radio, mobile phones, and personal computers, as well as the rules and laws that govern these media and tools. [3]

ICT has contributed to the fusion of knowledge and technology, simplifying the information acquisition process for the rural populace. Knowledge is information for an individual, but it also has positive effects on the entire community. The 1960s information exchange with farmers on new production techniques was a major factor in the green revolution's success. Rural economies can benefit from ICT by placing an emphasis on social production, social consumption, and social services (Malhotra, 2001). However, Sen (1999) convincingly argues that the development goes beyond macroeconomic growth. He proposes a different definition of development, stating that it is the expansion of peoples' total and quality of options for pursuing their life and means of survival.

Everyone should be given fair and equal possibilities to select their own means of subsistence, according to the equity idea. Rural residents should be free to decide how they want to move forward in their lives. ICT is the umbrella term encompassing a number of electronic technologies, such as transmission and display, that facilitate information processing and communication. ICT encompasses more than just the internet, computers, and phones. The majority of contemporary technology, including slide projectors, mobile phones, personal digital assistants, and digital cameras, can be linked together to share and exchange data. These devices are all currently categorized as ICTs.

Undoubtedly, having access to information is essential for successful development. Any nation's socioeconomic development is closely related to the expansion of communication and access to information. [4]

5.2 Applications of ICT in Rural Sectors:

5.2.1 E-Governance:

Reduced poverty and improved environmental conditions can be achieved through ICT-enhanced better governance. Information and communication technologies (ICT) are being used by governments increasingly frequently to offer services in places where citizens may easily access them. Bringing cooperative unions, state and local government agencies, and central government departments to the doorsteps of villages is the aim of rural ICT applications. [5]

5.2.2 Lokvani Project (Uttar Pradesh):

In the Sitapur area of Uttar Pradesh, a project known as Lokvani was launched in November 2004. This project aims to provide a single-window, self-sustaining e-Government solution for handling grievances, keeping track of property, and providing various essential services.

5.2.3 Ministry of Health & Family Welfare (MoH &FW):

The Ministry of Health and Family Welfare has put in place an Integrated illness Surveillance Programmed network that connects all district hospitals with medical colleges of the state to facilitate tile-consultation, tele-education/training of health professionals, and tracking illness trends. On a national level, it has helped fund a few pilot tele-ophthalmology and rural telemedicine projects. [6]

5.2.4 Tele-education:

The right to education is a fundamental right for every Indian person. All children up to the age of 14 must obtain an education, according to Article 45 of the Indian Constitution. Several Indian States still struggle to offer high-quality education after their 64-year independence. Over a million rural schools are located in 6,38,000 communities throughout India. Schools are promoted in rural India in an effort to raise the country's literacy and educational standards. [7]

5.2.5 ICT Empowering Rural Life:

The most important function that ICT plays in empowering people is the supply of accurate and timely information that is acceptable in terms of quality and cost. Access to credit and rural banking services is facilitated for the benefit of rural areas. Recent initiatives in mobile banking increase local business and cut costs. About 70% of the poor people in India live in rural areas and rely on agriculture for a living.

Using ICTs, farmers may be given pertinent information on matters such as crop maintenance, animal care, inputs for fertilizer and feedstock, bug management, seed source, and market prices. The degree of education and literacy is one of the most important factors in development in rural areas. ICTs are successfully applied in the classroom to improve student learning results. It's important to underline the value of implementing ICT-enabled activities in rural schools. Teachers have access to additional educational programs. [8]

Economic development fundamentally depends on connectivity to the outside world, and ICTs are essential in bridging the information divide between rural populations and the outside world. The successful use of ICTs can aid in connecting rural communities to international economic systems. Information and communication technologies (ICTs) have the potential to greatly enhance both individual and public health care. By providing new and more efficient ways of accessing, communicating, and storing information, ICTs can help close the information gaps that have emerged in the health sector of developing countries—between healthcare professionals and the communities they serve as well as between the authors of health research and the practitioners who need it. Through the development of databases and other applications, ICTs can help improve the performance of the healthcare system and lower medical errors. [9]

5.3 ICT Applications in Rural Development:

Rural residents may learn and innovate more efficiently with the use of ICTs, assisting them in resolving problems and improving their quality of life. They educate these communities and increase the efficiency of their development efforts in order to achieve the objectives of poverty eradication, food security, and sustainable development in rural areas. However, metropolitan areas in our country only account for the majority of technical applications. Rural communities haven't benefited from them sufficiently. In order to ensure the sustainability of the economy, the environment, and the best possible use of local resources, it is crucial to develop and implement appropriate "green" technologies along with reliable delivery methods, with an emphasis on rural people's technological competence. Rural residents may learn and innovate more efficiently with the use of ICTs, assisting them in resolving problems and improving their quality of life. They educate these communities and increase the efficiency of their development efforts in order to achieve the objectives of poverty eradication, food security, and sustainable development in rural areas.

However, metropolitan areas in our country only account for the majority of technical applications. Rural communities haven't benefited from them sufficiently. In order to ensure the sustainability of the economy, the environment, and the best possible use of local resources, it is crucial to develop and implement appropriate "green" technologies along with reliable delivery methods, with an emphasis on rural people's technological competence. Acquire and imbibe knowledge of technologies appropriate to their needs and environment;

- Upgrade their traditional skills and capabilities;
- Minimize fatigue and reduce drudgery; and

- Be innovative.

A. Equally ICT Should:

- Be capable of easy assimilation;
- Generate significant and assured added value to existing methods of operation;
- Generate employment and use local resources, both men and materials;
- Need low capital investment and result in low-cost production of goods;
- Be capable of replication and adoption; and
- Blend harmoniously with existing ecosystems leading to tangible improvements in the living conditions and self-sustained development of the rural people. [11]

In order to create local capability, find solutions to the problems listed, and improve the lives of rural people by improving their surroundings and daily activities, appropriate or green technology with the aforementioned characteristics may be important. The focus must be on equipping individuals with the information and critical thinking necessary to use technology in a way that fosters independence and the ability to decide what is in or out of their best interests. They will have greater access to affordable, environmentally friendly technologies as a result, and major jobs that boost the local economy will also be produced. However, participatory systems that take a practical approach—or the effective permeation of technology from the perspective of people's acceptance as well as the capacity to make suggested interventions sustainable for them to manage—are the key to the development and adoption of such green technologies. This requires:

- Need identification/assessment of the people by local voluntary or science and technology-based field groups;
- Identification of ideal technological options, as per location specific needs, skills, and resources available;
- In-house technology appropriation or with assistance of nearby technical institution to a scale and level, which is acceptable to the people for long term sustainability;
- Technology back up for 2-3 years through continuous handholding to people; and
- Establishing backward and forward linkages for long term sustainability.

The field team can gradually withdraw once the complete system and technology package is in place and transfer duties to locally founded people's groups and organizations for ongoing use and distribution. [12] With the aim of reaching the majority of people who live in the vast rural areas of India, a number of grassroots level organizations with scientific and technological capabilities are supplying crucial links between the emerging new developments in knowledge and technology, as well as aiding in the strengthening and diversification of the local economy, utilization of local resources, and improvement of the skills of artisans, landless laborers, and other disadvantaged sections.

By using the aforementioned strategy, these organizations have developed tested and practical models of a variety of green technologies for socio-economic upliftment through skill upgradation, revenue production, drudgery elimination, sustainable resource usage, etc. Such initiatives have noticeably altered the way of life in rural areas and have the potential to extend to other parts of the country. [13]

5.4 ICT and e-Governance for Rural Development:

Several governments are constructing State Wide Area Networks (SWAN) to allow residents of remote areas to access state and district administrative services online. Information and communication technologies (ICT) are being used by governments increasingly frequently to offer services in places where citizens may easily access them. Bringing cooperative unions, state and local government agencies, and central government departments to the doorsteps of villages is the aim of rural ICT applications. These apps employ ICT to offer more efficient and cost-effective processing and networking alternatives. With the computerization of land records, ICT has been used for rural development with great success. Land records are highly valued by contemporary socioeconomic imperatives, and it is essential to update and revise them in order to reflect changes in rural social dynamics. Land records are an essential part of rural development. The CoLR (Computerization of Land Records) program was introduced by the Indian government in 1988–1989 with the following main objectives:

- Creating database of basic records
- Facilitating the issues of copies of records
- Reducing work load by elimination of drudgery of paper work
- Minimizing the possibilities manipulation of land records, and
- Creating a land management information system

CoLR substantially helped the farmers. The farmers have immediate access to information about their property and may obtain all relevant records whenever they are required. These records are also free from human arbitration, quick to update, and free from harassment. [14]

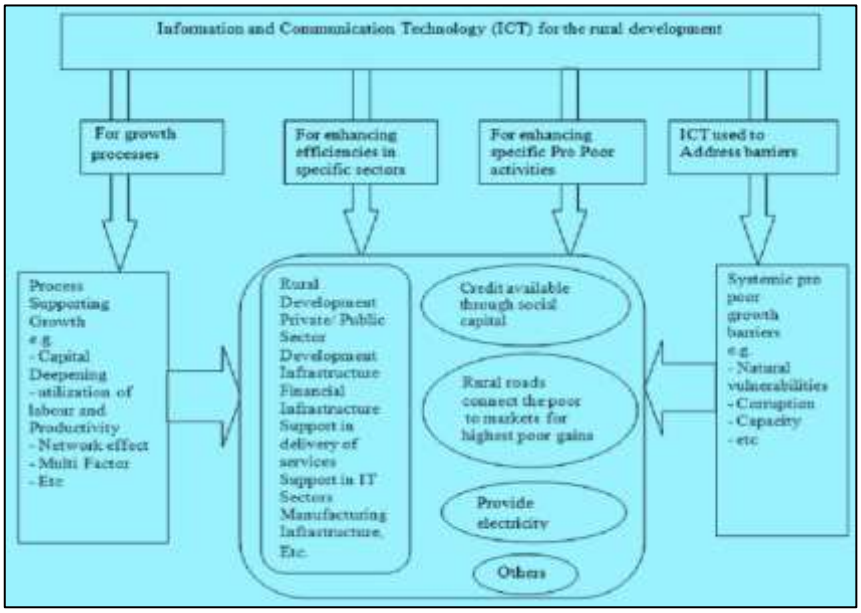

Figure 5.1: ICT as a key for rural development

5.5 New rural development policy paradigm in the information economy:

Rural development policy nowadays needs to deal effectively with a number of challenges that are relating to the:

- Differentiation of rural regions based on both resources and history, tradition, values, etc. of local societies, the effective exploitation of which calls for a place-based multi-objective approach, falling into the general planning goal of sustainable development.
- Shift from an agriculture-based rural development approach to a multi-sectoral development perspective that will pursue the sustainable exploitation of the whole range of resources available in rural regions (e.g., small-scale food processing, new alternative forms of rural tourism, non-agricultural rural economy), which calls for a cross-sectoral approach.
- Need to establish interaction among sectors in order to develop synergies and reap the benefits out of them for the whole region, which calls for an integrated approach.
- Need to mobilize all actors involved (citizens, businesses, administration, institutions, etc.) by establishing proper communication platforms for the exchange of ideas, seeking for a wider consensus on future rural development paths, which calls for a society-empowering approach, based on participation.
- The need to get access to information and knowledge sources that will increase knowledge capacity in rural regions, which calls for an inclusive information and knowledge society approach. In Figure 5.2 below is presented the shift from the traditional to the new rural development policy paradigm. [15]

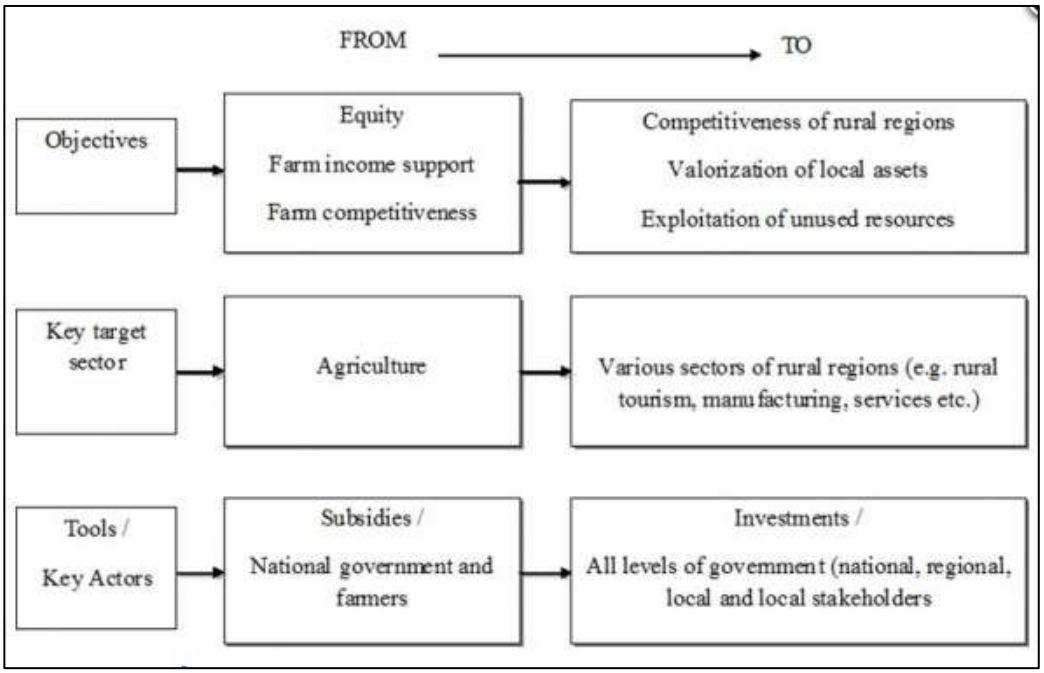

Figure 5.2: From traditional approaches to a new paradigm of rural development policy [16]

5.6 Challenges:

Like anything else, information and communication technology for the rural sector has a price. Fantastic career opportunities and efficient e-governance are made possible by technology, but it also makes individuals more vulnerable, unfair, hazardous, and unstable in society. When seeking to bring ICT to the rural people, the government meets formidable obstacles because the majority of them do not have access to the internet, creating large gaps that must be filled. According to studies, utilizing ICT to deliver services exposes societal disparities and isn't always inspiring. ICT use by the government could exacerbate the problem. Insufficient infrastructure, a lack of capacity, inaccurate and insufficient information, language barriers, computer resources, and poor phone connectivity. Social differences can persist despite technology's greatest efforts to bring people together. arise as a result of technology. [17]

According to a World Economic Forum study, India has the greatest digital gap. Another major problem in India is a lack of accountability; starting services won't help the country until accountability is upheld. ICT-based growth will only be accomplished if it is suited to the requirements and desires of the local community. People closest to the action should be involved in formulating and implementing ICT policy on the needs of the people since they are the most knowledgeable about it. This initiative will provide employment opportunities and involve rural inhabitants in the development process. One of these issues is that jobs in this sector frequently require native English speakers, and rural areas with poor educational opportunities are left behind the key reasons why rural areas have not benefited from ICT. Indeed, as computerization advances, many workers will lose their jobs. Because the vast majority of the workforce is left behind, they lose their jobs, which decreases their income and standard of living. ICT has a lot of promise to improve rural residents' quality of life, but it hasn't done so yet. Rural poor are at a disadvantage since they do not have the essential skills for the industrial or tertiary sectors. Power outages and insufficient electricity supplies are two other major issues in rural areas. There are fewer active users because of connectivity issues and the tiny number of people using ICT in rural areas. Due to the absence of conveniences and luxury, few people want to work in rural areas, which results in a shortage of technical resources for supporting rural populations. The lack of quick action or money for technical improvement at the municipal level is the final but not the least issue. [18]

Need to Focus on Indian Rural Communities: Even after 57 years of independence, India still has a severe problem with its rural poor and how to increase their level of income. The population distribution by rural-urban areas in India and a few chosen states is shown in Table 1 (Census of India, 2001). Out of a total population of 1027 people, 742 million live in rural areas, while 285 million reside in urban areas. (102.7 crore). There are 600,000 villages in India, totaling 27.60 lakh square kilometers. The lack of roads, power, clean drinking water, healthcare facilities, educational institutions, and communication networks in these communities contributes to the poverty of the rural population.

According to India's inaugural Social Development Report, a sizeable portion of its population—26%, or over 260 million—remains below the poverty line (193 million in rural and 67 million in urban areas). Concentrations of poverty are growing both in terms

of geography and among specific social groups. Kerala has the highest rate of poverty (12.72%), followed by Haryana (8.74%) and Punjab (6.16%), according to data from 1999-2000. The states of Orissa (47.15%), Bihar (42.60%), and Assam (36.09%) have the highest rates of poverty. Despite a decline in poverty, there are still 43.8 Scheduled Tribes, 36.2 Scheduled Castes, and 21 Other Backward Classes that are considered to be poor.

Table 5.1: Rural-Urban Distribution of Population – India and Select States [19]

India/State/Union Territory*	Population			% Rural population
	Total	Rural	Urban	
India	**1,027,015,247**	**741,660,293**	**285,354,954**	**72.22**
Jammu & Kashmir	10,069,917	7,564,608	2,505,309	75.12
Punjab	24,289,296	16,043,730	8,245,566	66.05
Delhi*	13,782,976	963,215	12,819,761	6.99
Uttar Pradesh	166,052,859	131,540,230	34,512,629	79.22
Bihar	82,878,796	74,199,596	8,679,200	89.53
Assam	26,638,407	23,248,994	3,389,413	87.28
West Bengal	80,221,171	57,734,690	22,486,481	71.97
Orissa	36,706,920	31,210,602	5,496,318	85.03
Madhya Pradesh	60,385,118	44,282,528	16,102,590	73.33
Maharashtra	96,752,247	55,732,513	41,019,734	57.60
Andhra Pradesh	75,727,541	55,223,944	20,503,597	72.92
Karnataka	52,733,958	34,814,100	17,919,858	66.02
Kerala	31,838,619	23,571,484	8,267,135	74.03
Tamil Nadu	62,110,839	34,869,286	27,241,553	56.14
Pondicherry*	973,829	325,596	648,233	33.43

5.7 Factors Preventing Rural Communities to Reap Benefits from ICTs:

There are a number of significant barriers limiting rural communities in developing nations from utilizing ICTs to their full potential. Without creating access models that can take these considerations into account, rural populations will lag significantly behind metropolitan residents who have access to more digital options. Table 1 lists the basic metrics (2004 population growth, GDP, and teledensity) as well as the IT indicators (number of hosts, users, and PC penetration) for selected regions and nations. [20]

Table 5.2: Indicators for Basic and IT for Select Regions/Countries

Regions/ Countries	Indicators					
	Basic			IT		
	Population (in millions)	GDP per capita (in US $)	Tele-density	No. of Hosts	Users (in k)	PCs per 100
Americas	869.94	15,249	76.51	205,480,386	245,752.2	12.52
USA	293.66	36,273	122.71	195,138,696	161,632.4	65.89
Europe	801.31	14,353	111.58	29,040,707	250,239.4	28.48
UK	59.80	26,369	158.51	4,173,453	37,600.0	60.02
Asia	3,717.79	2,361	33.56	27,986,720	305,242.2	6.39
India	1,081.23	560	8.44	143,654	35,000.0	1.21
China	1,299.88	1,096	49.74	162,821	94,000.0	4.08
World	6,359.70	5,528	46.41	267,541,177	841,757.3	9.63

5.8 Conclusion:

According to the findings of my study, ICT technology breakthroughs have significantly increased the amount and speed of information transit while decreasing the cost. By enhancing information access, expanding local markets, generating more job opportunities, and enhancing access to governmental services, ICT in rural areas is unquestionably the solution to gradually remove the traditional development barriers. India's economy is among the fastest growing in the world, and the country is making progress in a number of sectors, including rural development. Urban growth is faster than rural development. Rural development is remains sluggish even though the government is putting several programs and policies into place. According to observation, a lack of information and awareness of the programs and resources available is the main factor leading to the underdevelopment of rural areas. India must make it possible for its rural citizens to access and use IT in order to include them in the development of the country's economy. Rural citizens are the nation's most valuable resource due to the agrarian structure of the Indian economy, but they receive few benefits. In this study, a few ICT innovations that were built expressly for rural applications while taking into account connections, cost, and end user potential were presented. This article also discussed the multiple ICT applications in the rural sector, such as e-governance, telemedicine, agriculture, risk management, and women's empowerment. A review of the many national and state-level measures the Indian government has taken to promote the use of ICT for socioeconomic development in rural areas is being done to determine the effectiveness of the programs.

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