

# A study on significant usage of technology in rural development with specific reference to Indian context

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## **Abstract**

Various efforts in the recent past have demonstrated the importance of the I.C.T. in rural development. Several efforts have helped to cut expenses while simultaneously increasing openness. Developed as pilot projects, a large number of rural e-Government apps sought to provide simple access to citizen services and better government-to-citizen transaction processing. The importance of science and technology for rural development has been acknowledged to a far larger extent in emerging nations. Improvements have been made in a variety of sectors in rural regions, including people's livelihoods, educational institutions, medical and health-care facilities, small-scale enterprises, agriculture, energy, water, housing, information technology, space technology, women, and job possibilities. The use of new approaches and technology has resulted in advancements and growth in all of these fields. The advantages of computers and television have been recognized by rural communities. Agriculture is the primary source of income in India's rural areas, and people are more aware of modern agricultural techniques, irrigation systems, seeds, fertilisers, and other products. The researcher has discussed science and technology from an Indian perspective, including its features, examples of relevant technologies, applications of science and technology, the importance of science and technology, and the function of science academies in this research article. Rural development has progressed, but much more awareness and thinking is necessary for the rural regions to continue to grow. This is a study article in which the researcher tries to emphasize the use and benefits of technology for the development of rural regions. Healthcare, medical, education, transportation, tourism, industry, business, management, administration, banking, and rural development are all areas where technology has become essential in today's society. The use of computers and software programmes is at the heart of technology. It can refer to machinery, equipment, tools, skills, knowledge, and expertise, among other things. The use of technology for the development of rural regions has been done on a large scale, and as a result of the efficient application of technology, there has been expansion and advancement in the field of agriculture. The objectives of technology development in rural areas, benefits of technology application in rural areas, areas of technology application, the role

of information and communications technologies in rural development, challenges faced by rural areas, and ways of connecting energy access and rural development are the main areas that have been highlighted in this research paper. The major goal of this article is to present information on how technology advancements are assisting in the development of rural regions. Rural development in India is highly important for the country's growth, as has been widely acknowledged. This is due to the fact that over 70% of India's population lives in rural regions, and therefore rural development will effectively contribute to the country's development.

**Keywords:** Rural Development, Technology, Information Technologies, Energy, Applications, Rural Areas, e-governance, online transaction processing

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### Introduction:

Science and technology may play a vital role in bringing about social and economic development in our society, particularly in rural regions, especially in developing countries. In the case of rural development, it is critical to achieve long-term changes in rural living conditions by utilising, protecting, and enhancing natural, physical, and human resources. Science and technology are acknowledged for their importance in providing jobs and economic possibilities for rural residents while also preserving and safeguarding the environment in rural regions. There has been a surge in interest in rural development, owing to the fact that a concerted effort is required to improve living conditions in rural regions, where the great majority of the developing world's population resides. Rural development has several major goals: to improve people's living conditions by providing food, shelter, clothing, employment, and education; to increase productivity in rural areas and eliminate poverty; to involve people in planning and development by involving them in decision-making and decentralizing administration; and to ensure justice and equal opportunity. Recognize the importance of science and technology in order to achieve these goals. Agricultural extensionists and rural advisory service providers have traditionally prioritized improving farmer access to information in order to enhance their socioeconomic situation. According to FAO (2011), disseminating information is essential for players in the agriculture value chain to minimize knowledge and communication asymmetries, as well as to break the poverty cycle. In addition, the importance of ICTs in gaining access to more information to improve food security and promote rural livelihoods has been more acknowledged and formally approved at the World Summit on the Information Society (WSIS) 2003-2005. (IICD, 2007). Agriculture is considered the backbone of the Indian economy, with 56.6 percent of the Indian population relying on it (GoI, 2011b). As a result, agricultural expansion is critical for promoting economic development and feeding the expanding population (Datt and Ravallion, 1996). The contribution of information and expertise, on the other hand, is one factor that can help improve agricultural productivity. ICTs may be utilised to bridge the information gap since agricultural extension is heavily reliant on information sharing on the one hand and a wide variety of other players on the other (Mabe and Oladele, 2012). Farmers and residents of rural communities are increasingly recognizing the value of knowledge, information, and proper learning techniques in moving toward growth (Greenridge 2003, Lightfoot 2003). As a result, extensionists are struggling with the topic of how to use ICTs to enhance rural lives and contribute to improved information sharing and access in order to help rural people. Extension professionals are also interested in experimenting with novel e-extension efforts in this respect (Saravanan, 2010). Agricultural extensionists and rural advisory service providers have traditionally prioritised improving farmer access to information in order to enhance their socioeconomic situation. Agriculture is considered the backbone of the Indian economy, with 56.6 percent of the Indian population relying on it (GoI, 2011b). As a result, agricultural expansion is critical for promoting economic development and feeding the expanding population (Datt and Ravallion, 1996). The contribution of information and expertise, on the other hand, is one factor that can help improve agricultural productivity. ICTs may be utilised to bridge the information gap since agricultural extension is heavily reliant on information sharing on the one hand and a wide variety of other players on the other (Mabe and Oladele, 2012). Farmers and residents of rural communities are increasingly recognizing the value of knowledge, information, and suitable learning techniques in moving toward growth (Greenridge 2003, Lightfoot 2003). As a result, extensionists are struggling with the topic of how to use ICTs to enhance rural lives and contribute to improved information sharing and access in order to help rural people. Extension professionals are also interested in experimenting with novel e-extension efforts in this respect (Saravanan, 2010). ICT refers to the use of creative methods to make information and communication technology more accessible in rural areas. ICT advancements may be used to provide farmers with appropriate information and services, therefore creating a more

rewarding agricultural environment. Through ICT, farmers in rural regions may be taught on contemporary farming methods.

### **Science and technology: An Indian perspective**

During the first three decades after India's independence in 1947, there was very little economic development inside the nation, with just approximately 3%, but there was a rise in scientific and technology infrastructure facilities. There have been advancements, advances, and introductions of novel scientific procedures in the country in recent decades, notably towards the start of the twenty-first century. Science and technology have not progressed at the same rate as the commercial and industrial sectors. Science and technology systems are suffering crises and setbacks, and public sector science and technology systems are in serious trouble. In most cases, in the domain of information technology, income production inside the country through science and technology services has contributed to increasing wealth for the educated middle class. The majority of growth in India has been driven by science and technology, with technical elements playing a particularly important role in the development of rural regions. Agriculture, small-scale enterprises, residences, dwellings, structures, medical facilities, school systems, offices, and other sectors have all existed in rural regions. It is critical to recognize the importance of science and technology in order to grow these areas. Major advancements can only be accomplished through science and technology. The central government established science departments, including those for science and technology, biotechnology, non-conventional energy sources, ocean development, scientific and industrial research, and space. Rural people rely on the water bodies and lakes that are close to their homes in the majority of situations; thus, it is critical to guarantee that water is used effectively and that development is carried out in a safe and secure manner. It is the responsibility of rural residents to maintain water bodies clean and not to dump garbage into them.

### **Significance of science and technology:**

Science and technology have long been recognized as important components of rural development; they are linked to development because they have a track record of improving people's lifestyles, health conditions, income production, and productivity. Science and technology have long been seen to be key components in solving the most serious problems that rural residents confront, such as poverty reduction and economic concerns. Poverty has long been seen as the most significant challenge confronting rural people; nevertheless, breakthroughs in science and technology have been made for the rural people's welfare in order to address these issues. Agriculture, health, energy, water, and environmental issues have been the primary topics. When scientific and technical elements are properly used in these five areas, poverty will be reduced, and people will have better access to food, health care, energy, clean water, and environmental issues. Environmental concerns such as air pollution, water pollution, changes in climatic conditions, stratospheric ozone depletion, and loss of biological diversity, land degradation, and desertification can have a negative impact on the incomes of poor people who rely on the environment for their livelihood. Air and water pollution can also have a negative impact on human health. Recognize that local, regional, and global environmental concerns are all interrelated and have an impact on long-term development. As a result, there are synergistic potential to develop more effective response choices to various environmental challenges that improve benefits, lower costs, and better fulfil human needs in the long run. When environmental policies are implemented, countries' ability to adjust and relieve can be improved. Science and technical aspects are crucial for economic progress. First, since the industrial revolution, both wealthy and developing nations have had the highest science and technological ability and have expanded at a faster rate. Scientifically and technologically advanced countries have been progressively affluent from 1870 to the present, and their growth rates have not slowed. Second, in both developed and developing countries, improvements in research and development have been executed in a consistent positive and high manner throughout almost all disciplines and industries that have been considered. Third, rural people require a source of income; they would like to have some kind of job so that they can provide for themselves and their families. Income generation has been considered to be essential for economic growth and science and technological factors have contributed to the creation of employment opportunities for rural people not only in agriculture but also in other fields.

### **Statement of the problem:**

Given the importance of agriculture and rural development in India's economy, the researcher has sought to investigate the degree of accessibility, availability, and use of ICTs, as well as the challenges farmers experience in gaining access to ICTs. In fact, it is critical to recognize that in order to effectively reach the farming and rural development communities, it is necessary to research the types of communication media and ICTs owned and used

by farmers, their frequency of use, and the degree of usefulness of various ICTs, as knowledge of the use of various ICTs will aid in the development of an appropriate extension strategy. In this light, the study's goals were devised as follows:

- To measure the level of access, availability and usage of ICTs among farmers
- To find out the constraints in the use of ICTs among the farmers
- To find out the association between accessibility and usage of ICTs with independent variables

#### **Schemes and Programs associated with Science and Technology:**

The effective, scientific, and optimal evaluation, conservation, exploitation and distribution of rural resources determines rural development. As a result, science and technology, as well as rural development, are intertwined and interdependent. In the realm of agriculture, technological advancements have resulted in significant increases in agricultural production. High-yielding and disease-resistant seeds, fertilisers, pesticides, better tools, irrigation and drainage, crop rotation and cropping patterns, storage, processing, and marketing are just a few examples. In recent years, a number of projects linking science and technology to rural development have been developed. The most important ones are as follows:

1. Science and Society Program of the Department of Science and Technology (DST), the Government of India. It includes
2. S and T Application for Rural Development (STARD)
3. S and T Application for the Weaker Sections (STAWS)
4. S and T for Women
5. S and T for practical and strategic needs of SC Population
6. Empowering tribal groups through S and T
7. Scheme for Young Scientists

Other initiatives for the development of animal husbandry and fisheries, which are important aspects of agriculture in rural India, are also available. Dairy Development Program (DDP), Fodder Development Program (FDP), Intensive Cattle Development Program (ICDP), and Special Livestock Production Program are examples of these programmes (SLPP). Under these initiatives, everyone is made aware of S and T inputs resulting from genetics and breeding, botany, microbiology, and biochemistry studies. These initiatives assist small and marginal farmers and agricultural labourers to establish poultry, piggery, fishery, and sheep production units, as well as the breeding of cross-heifers. Special initiatives for the development of hill areas, tribal territories, drought-prone and desert areas, command areas, and other places have been launched using area-specific techniques. Hill Area Development Program (HADP), Tribal Development Program (TDP), Intensive Agricultural District Program (IADP), Drought Prone Area Program (DPAP), Desert Development Program (DDP), Command Area Development Program (CADP), and Whole Village Development Program are some of the programmes available (WVDP).

#### **Major characteristics of Science and Technology:**

Science's techniques and technology's culture must be put into practise in a methodical manner.

Observation, measurement, recording, categorization, comparison with previous experiences, hypothesis generation, and hypothesis testing through new, novel experiences are all part of the scientific process. Making notes on material, product, and process specifications, performance indices, future planning, and thinking of how to properly use resources, materials, energy, and money should all be part of a technological culture. Biotechnology, space research, microelectronics, computers, and high-tech will all be extremely beneficial to rural regions. Plans, operations, and maintenance are all features of science and technology; in the case of technologies, more regular maintenance is necessary; locally accessible talents; equipment and materials are used to maintain technical components. In the case of rural development, only technology that can be readily controlled and repaired should be employed. Technologies should be economically viable, useful, and contribute to the rural population's healthy lifestyle. Low-cost, low-usage, and making the most of low-usage should all be incorporated.

#### **Examples of appropriate technologies are highlighted below:**

The examples of appropriate technologies that have been used in rural development have been stated as follows:

1. **Information and Communications Technology:** Low-cost computers have been developed, and they are now widely utilised in underdeveloped nations. Computers are the most widely utilised technological methods; when conducting research in a specific field, the internet is employed; it is the most complete and suitable source of information on any topic, issue, or difficulty.



2. **Construction:** Technology such as rammed earth, dutch brick, and cob are utilised in the construction of houses and other structures; these materials are widely available and affordable. These building materials make houses and buildings sturdy, adaptable to all types of weather, and well-constructed. Rural people have easy access to these resources, allowing them to complete their building projects in a timely and efficient manner.
3. **Energy:** Solar cells, wind power, and micro, hydroelectric power may all be used to generate electricity, with the energy stored in batteries. Biobutanol, biodiesel, biogas, and vegetable oil are examples of energy sources. However, as the world changes, rural regions are gaining access to electricity, which is important to improve one's living conditions.
4. **Cooking:** Smokeless and wood-saving stoves increase efficiency, save time and labour, minimise deforestation, and provide substantial health advantages. Solar cookers might be useful in some situations, depending on the climatic circumstances and cooking methods. According to research, people in rural regions use electric stoves to cook their meals.
5. **Health care:** Science and technology are used in the development of health centres, the supply of medical services, and the provision of health benefits. Medicines and novel devices are being developed at hospitals and health care facilities in rural regions as a result of technical elements and scientific development.
6. **Refrigeration:** Certain foods require refrigeration, and people in rural regions prefer to drink cool water in hot weather, thus a pot refrigeration system was developed to keep goods cold even without power.
7. **Television and Radio:** These are the technical advancements that have enhanced the lives of rural people; they love watching television shows and movies, as well as listening to the radio. Television and radio have become their primary means of pleasure, and they have learned a variety of skills that they apply in their everyday job. For example, agricultural shows on television assist farmers, and they employ the proper procedures in their profession.
8. **Agricultural Technologies:** Rice, wheat, and maize production have long been regarded as the most significant breakthrough in agricultural technology. The introduction of technology eased problems of pollution and depletion of land and water, resulting in a massive reduction in poverty.
9. **Computers:** Individuals in rural regions are using computers to supplement their grasp of numerous ideas, according to research. Students and youngsters are the ones who utilize computers to the greatest extent. They can not only gain a better grasp of academic ideas by using computers, but they can also work more efficiently on their projects and assignments and communicate more effectively. In rural regions, computer centres have been established where people may work on computers as well as use other technology like printers and scanners.
10. **Mobile Phones:** Mobile phones are widely used by people in rural areas. Individuals of various ages are utilising mobile technologies. It's used for a variety of things. According to studies, people in rural areas are undereducated. They are either illiterate or have limited literacy abilities. They typically use mobile phones to communicate as well as for entertainment.

#### **Significant applications of science and technology in development of rural areas:**

The main objective of the science and technology applications is to empower the knowledge of the people. It means developing the capability amongst the individuals to achieve their goals and objectives through the generation, acquisition and use of knowledge.

1. **Energy:** For agricultural inputs such as fertilisers, water delivery, and transportation, energy is required. It is also required in order to achieve rural industrialisation. Firewood is still the single most important source of energy, and it will be for a long time. As a result, large-scale afforestation operations based on scientific principles and engaging the rural populace are required to satisfy their fuel needs. Tissue culture techniques for biomass production are quite beneficial. Non-conventional energy sources, which are renewable, decentralized, and non-polluting, are especially important in rural regions where power is unlikely to be available for a long time. Biogas plants, smokeless stoves, solar cookers, pumps, solar water pumping systems, solar domestic lighting systems, community lighting and television systems, and solar battery charging units are examples of energy sources that have enabled rural industrialization to decentralize, resulting in the creation of jobs and the transformation of natural resources into higher-value products.
2. **Water:** Water is the most important single resource for human survival. Every effort must be made to enhance the supply of drinking water in rural regions; scientific methods for water collection, conservation, and recycling must be devised and implemented. The provision of safe drinking water in rural regions must be prioritised; remote sensing is a strong tool for water targeting. Community participation, technology transfer, evaluation and assessment of existing rural water supply systems, studies on water distribution system maintenance, development and rehabilitation of springs, use of hydraulic rams for water supply in

hilly areas, use of solar energy for rural water supply, and development of an integrated package for water treatment are all needed to make this effort a success.

3. **Housing:** Several technologies have been used to produce low-cost building materials, designs, and construction processes; non-erodible mud plaster has been available to protect mud walls from rain.
4. **Biotechnology:** Biotechnology developments such as bio-fertilizers, aquaculture, biomass production through tissue culture techniques, and embryo-transfer technology to upgrade cattle, herds, and other activities in daily life in rural areas have enormous potential for job creation and increased efficiency and productivity; mechanisms to make these effective on a large scale must be developed.
5. **Information Technology:** Agriculture, irrigation, energy, health, family planning, education, employment, and transportation all require the use of information technology to bring about substantial changes in the rural sector. To carry out successful decentralised planning, it is necessary to have information on local resources, skills, and experience. The Department of Electronics founded the National Informatics Centre (NIC) in 1975, and it built a District Information System, which established a centre in each district in the country. A great number of training and information transfer programmes are based on the countrywide satellite communication network, which will aid in the dissemination of vital data for district and local planning.
6. **Space Technology:** Disaster warning for coastal fisherman, inland/marine fisheries, minor irrigation, water targeting for drinking water, wasteland identification, vegetation mapping, drought monitoring, and other uses of remote sensing technologies abound. Ground water potential zone maps have already been created for over 370 districts, including 91 DPAP districts and 20 DDP districts, using satellite imagery. A recent breakthrough is the use of satellite data to anticipate improved fish harvests in coastal locations. It is anticipated that effective use of space technology would result in improved information distribution via satellite-based communication and broadcasting. This will be especially useful in rural regions.
7. **Technology Transfer:** There are several technologies accessible in India; but, for efficient application, enough science and technology, labour, and infrastructure should be distributed throughout the country. What is most urgently required are adequate technology transfer methods and an understanding of what technologies are required and acceptable. Academic institutions, research laboratories, schools and colleges, including agricultural, medical, and engineering institutions, as well as non-profit organisations, must all be connected in this way. The majority of the effort is currently fragmented and compartmentalized, resulting in a considerably less impact than it might be.
8. **Women:** Women account for half of all human resources, and they now do a substantial portion of farming tasks in India. Field operations, plantation activities, livestock management, fisheries, sericulture, beekeeping, agriculture, forestry, and other activities are among their responsibilities. It is critical to provide appropriate training programmes for women as well as measures that will decrease drudgery and increase their efficiency and output. Women may also be excellent disseminators and communicators of basic agricultural and post-harvest technologies, as well as health-care delivery methods. The visible influence of developmental initiatives on society as a whole will not be realized until women are actively involved in them. It is critical to disseminate and execute S and T related to programmes since it will have a significant multiplier effect.
9. **Employment:** With science and technology inputs in the areas of agricultural practises, animal husbandry, small scale industries, training and skill improvement of rural people, education, awareness generation, and popularisation of scientific methods and approaches, biomass cultivation, utilisation, and agro-processing through innovative bi-products, employment opportunities in rural areas can be generated.

#### **Role played by science academies in usage of technology in rural development:**

Progress in science, technology, and innovation is essential, but not sufficient, in addressing the various underlying barriers to long-term development. Poor governance at all levels, from local to global, insufficient education systems, and a lack of rural development (road access, funding, education, and women's empowerment) are among them. The Academies think that through promoting scientific ideals such as evidence, openness, ethical standards, and social responsibility, they can help to promote good governance. They recognize the environment in which science and technology operate and vow to assist policymakers in developing sustainable development policies by fowling:

- i. Goals and objectives must be set in order for growth to occur.
- ii. Working with other academies to develop fresh innovative ideas, knowledge, and awareness
- iii. Supporting procedures for defining, monitoring, and measuring progress toward long-term goals at the national, regional, and international levels

- iv. Policies should be developed to mitigate the negative consequences of science and technology
- v. Human resource development in science, technology, and innovation is being trained and supported
- vi. Promoting interdisciplinary research as part of a comprehensive approach to sustainable development that includes business sector participation
- vii. Raising public understanding of the significance of science and technology, as well as how it may benefit rural communities
- viii. Promoting researcher mobility and the development of more creative research techniques

#### **Initiative programmes for sustainable development:**

Sristi, the society for research and initiatives for sustainable technologies and institutions, is facilitating the use of information and communication technology (ICT) to strengthen the capacity of grassroots inventors, innovators, and entrepreneurs working to conserve biodiversity and develop environmentally friendly solutions to local problems.

Honey Bee, Gian, and others are promoting the spirit of invention by transforming inventors into goods and fostering experimentation at the grass roots of knowledge rich, economically impoverished individuals. In the devadurga Taluka in Koppal district in North Karnataka, Samuha is launching a pilot project to employ ICTs and GIS technologies for a networked HIV/AIDS intervention and awareness campaign. Cash (community access to sustainable health) is a media lab Asia project that looks at how information technology may be utilised to enhance rural healthcare in a cost-effective way. The Infodev-sponsored initiative prepared low-income women with a variety of disabilities, including limited language and communication skills, for employment in the ICT-enabled industry. Small groups of selected learners were given intense hands-on computer instruction based on real-world experiences with MS Office 2000 as part of this initiative. Tel nek, a telenetworking initiative run by Suvidya and Anchorage in Bangalore, aims to empower rural and semi-rural women in Ramanagram Taluk, Bangalore district, between the ages of 18 and 35. The Grassco initiative aims to provide three types of connectivity: phones, the internet, and transportation. Over 5,000 young men on bicycles would bring mobile phones equipped with CDMA wireless local loop into 5000 West Bengal communities as part of the Grassco initiative.

Farmers' main challenges were a lack of confidence in using ICTs, particularly mobile phone applications, due to a lack of exposure and understanding on how to effectively utilize ICTs to reap the benefits. Farmers' use of ICTs was further hampered by the inability to charge mobile phones owing to inconsistent and variable power supplies. However, most farmers were unable to use ICTs for development as a result of this. Farmers' use of mobile phones is also hampered by a lack of connectivity. Farmers stated that connection is extremely restricted, with just a few networks available. As a result, farmers do not regard the use of mobile phones as dependable or trustworthy when poor network access is a barrier to their use. Furthermore, save for personal communication, the majority of farmers are ignorant of the socio-economic advantages and stimulation that ICTs may offer to their life. It is difficult to argue for the influence of ICTs for development due to a lack of demonstration, experience, and practical exposure among farmers that ICTs may assist them. Farmers also stated that they had trouble using mobile applications and the internet owing to a lack of knowledge. This, however, is linked to a lack of ICT literacy.

Some respondents stated that they are unable to use most fundamental functionalities of mobile phones, such as SMS, due to illiteracy and a lack of expertise in utilising them. Farmers also noted a shortage of ICT repair centres and services in the communities, particularly for mobile phones and televisions. Farmers were forced to fix their products and transport them to town at a considerable cost, resulting in additional expenditures and losses for the farmer. The adoption of ICTs was further hampered by attitudinal hurdles created by some of the elderly farmers. Only a few individuals mentioned a lack of funds as a hindrance to utilising ICT. Some of the farmers stated that they lacked training and practical experience with mobile phone applications and the internet, and that they required some training to educate and teach them how to utilize ICTs for agricultural and rural development. Farmers have also expressed their dissatisfaction with the high cost of fixing ICTs such as mobile phones and television sets. This did, however, prevent them from employing ICTs on occasion when the electronic item was frequently broken. Some of the farmers struggled to comprehend what was being said in English.

#### **Discussion:**

There have been difficulties in rural regions, such as poverty, unemployment, and illiteracy, and people's living situations are in a state of underdevelopment. Scientific techniques, investigations, research, and inventions are critical in finding answers to the challenges that affect rural communities. Because India is such a big nation with a wide range of geographical and ecological circumstances, as well as a different sociocultural background among the rural people, a uniform prescription or model would be inappropriate for use in all locations. The prescriptions will have to be site-specific, based on local natural resources, and rely solely on the local population's talents to achieve



their goals and fundamental needs. Energy, water, housing, construction, job creation, information technology, space technology, technology transfer, biotechnology, women, and health care facilities have all been areas where science and technology has been applied in rural regions. Information and communications technology, agricultural technologies, refrigeration, television and radio, cooking, healthcare, building, and energy have all been developed. It is undeniable that science and technology are the primary means of eradicating poverty and improving rural people's livelihoods. The science academies have set goals and objectives to guarantee long-term growth. It is necessary to begin working toward the goal of applying science to all aspects of rural development. The growth of the country will be dependent on the development of rural regions, as rural areas account for 70% of the country's population. It is possible to attain the intended aims and objectives by combining the efforts of scientists, administrators, and local residents, with the full backing of political organisations and non-governmental voluntary groups. Finally, it can be claimed that scientists and researchers play a critical role in enhancing rural development, and they must continue to make breakthroughs.

### **Conclusion:**

Today Different types of media are available in metropolitan and semi-urban regions, which have effectively transformed people's lifestyles. Various successful e-governance efforts, infrastructural improvements, and numerous ICT projects for development are bringing optimism to India's rural areas that the digital gap may be bridged. We can only say that this is the start; we still have a long way to go to accomplish our objective. However, in order to maintain numerous efforts and programmes, we must constantly monitor the needs. To close the digital divide between affluent and poor people, we need appropriate financial assistance, government and industry backing, community involvement, promoting private partnerships, and a large e-governance campaign including rural people. Many technologies are designed for the educated elite, but we need to develop technology for the general public. Rural information systems have traditionally focused on providing information to the rural poor and providing information on rural areas to policymakers, but it is now widely acknowledged that previous systems were inefficient in meeting the requirements of the rural poor. Agricultural information, in particular, is progressing beyond just sending messages (although this is still important). Interactivity, negotiation, and two-way information exchanges are becoming increasingly open, participatory, and demand-driven. There is a new emphasis on information acquisition, with the rural poor being able to seek information tailored to their unique livelihood requirements. ICTs' great potential to assist and improve these developments is increasingly recognized by communication professionals. The few young educated adolescents also utilised CSCs in the field of rural education, such as getting information on jobs and career possibilities, accessing educational resources, and studying basic computer courses. Lack of confidence in operating ICTs, erratic power supply, low network connectivity, lack of awareness of ICT benefits, lack of skill in handling ICTs, low ICT literacy, lack of repairing facilities, attitudinal barriers to ICTs, poor finance, lack of training and practical exposure, high cost of repairing ICTs, and insufficient regional language were all identified as barriers in the study. Given the increased availability and accessibility of ICTs among the state's farmers, it is necessary to ensure that the farmers' problems are addressed in order for the farming community to reap the maximum benefits from improved access to information services through the use of ICTs for agriculture and other developmental purposes.

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