

Overview Of Rural Infrastructure For Effective Rural Development

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Abstract

India is endowed with rich natural, physical, and biological resources but so far the country has not exploited even 25% of its potential for agricultural and rural development with an available stock of science, technology, and capital. The development model adopted in the 75 years in India could do little for rural people. There is an increasing consensus that providing adequate infrastructure is an important step in the process of poverty alleviation and in providing a more equitable set of opportunities for rural areas. Considering the importance of rural development, this paper attempted to focus on the necessity of sustainable rural development efforts needed for achieving sustainable rural development from the perspective of Sustainable Development Goals-SDGs, using secondary data. It is found that, despite the progressive growth in the development of infrastructure in the last few years, the quantity and quality of infrastructure facilities are substantially lower in rural areas than in urban areas and alarming deficiencies persist in rural infrastructure across Indian states. It is suggested that governments must allocate adequate resources in their annual budgets and implementing agencies including banks must have concern, commitment, and accountability to put in place infrastructure in each village in a time-bound program.

Keywords: Sustainable Rural Development, Rural Infrastructure, SDGs, Sustainable development

Date of Submission: 26-08-2023

Date of Acceptance: 06-09-2023

I. Introduction

India is endowed with rich natural, physical, and biological resources, such as land, water, labor, livestock, fisheries, forestry, vegetation, climate, solar, wind energy, etc. that are very much useful for building modern rural India. But so far, the country has not exploited even 25% of its potential for agricultural and rural development with an available stock of science, technology, and capital. More than 40 percent of people are living below the poverty line in India and most of them are in rural areas. To achieve the overall development of the nation there is a need to concentrate more on the rural areas to implement the policies and development measures. There are several barriers to the development of the rural areas that need to be focused.

The development model adopted in the 75 years in India could do little to rural people. Urban oriented, heavy industries, allied industries found urban centers as favorable locations. The benefits accrued from this development model also cornered by urban centers. Land reforms, green revolution also didn't result in self-reliant rural economy. Abundant labour resources available in rural areas were not taken into consideration for fuller use in the development process due to capital intensive nature of industrialization and strategies.

Raising the quality of life of the rural people, alleviating rural poverty and using rural development for laying a strong foundation for national development, empowering rural people through the development of productive employment, enhancing their income, ensuring environment protection, promoting gender responsiveness and ensuring adequate care for vulnerable groups, achieving integrated and even development on a sustainable basis, etc. are objectives of achieving the goal of sustainable rural development in alignment with Sustainable development Goals-SDGs.

There is an increasing consensus that providing adequate infrastructure is an important step in the process of poverty alleviation and in providing a more equitable set of opportunities for rural areas. By linking small and marginal farmers to the markets, and by reducing the market risk and transaction costs they face. In the light of these facts this paper attempted to focus on the necessity of sustainable rural development efforts needed for achieving sustainable rural development.

II. Objectives:

The development of rural infrastructure is crucial for promoting sustainable rural development. It aims to enhance the quality of life for people living in rural areas by providing them with access to basic services, improved connectivity, and economic opportunities. The objectives of rural infrastructure development are multi-faceted and can include the following:

Improved Access to Basic Services:

Provide access to clean and safe drinking water. Develop proper sanitation facilities to promote hygiene and health. Establish healthcare facilities and clinics for better medical services. Build educational institutions to ensure quality education.

Enhanced Connectivity:

Construct and maintain well-paved roads and bridges to connect remote villages with urban centers. Establish reliable and efficient transportation networks to facilitate the movement of goods and people. Enhance access to communication technologies (e.g., mobile networks, internet) to bridge the digital divide.

Agricultural and Irrigation Infrastructure:

Develop irrigation systems to enhance agricultural productivity and reduce dependency on monsoon rainfall. Create storage facilities (e.g., silos, cold storage) to prevent post-harvest losses and ensure better prices for farmers' produce.

Energy Infrastructure:

Promote electrification of rural areas to provide access to reliable and clean energy sources. Develop renewable energy projects (e.g., solar, wind) to reduce dependency on non-renewable sources and promote sustainability.

Rural Housing:

Facilitate the construction of affordable and sustainable housing for rural populations. Upgrade existing housing structures to improve living conditions and safety.

Job Creation and Economic Growth:

Establish industrial and economic zones in rural areas to attract investments and generate employment opportunities. Support the growth of small and medium enterprises (SMEs) to diversify the rural economy.

Natural Resource Management:

Implement sustainable land management practices to prevent soil erosion and degradation. Establish watershed management projects to conserve water resources and prevent flooding.

Social Inclusion and Empowerment:

Ensure the inclusion of marginalized groups (e.g., women, indigenous communities) in infrastructure planning and development. Empower local communities to participate in decision-making processes related to infrastructure projects.

Environmental Sustainability:

Implement environmentally friendly infrastructure solutions to minimize negative ecological impacts. Promote the use of eco-friendly construction materials and energy-efficient technologies.

Disaster Preparedness and Resilience:

Build disaster-resistant infrastructure to mitigate the impact of natural disasters on rural communities. Develop early warning systems and emergency response mechanisms to enhance resilience.

Promotion of Tourism and Cultural Heritage:

Develop infrastructure that supports tourism in rural areas, showcasing local culture, traditions, and natural attractions. Preserve and promote cultural heritage sites to enhance tourism and contribute to local economies.

Overall, effective rural infrastructure development seeks to address the unique challenges faced by rural areas while fostering sustainable growth, improving living standards, and reducing disparities between urban and rural regions.

III. Data sources:

Government Websites:

Government agencies and ministries responsible for rural development often publish reports, data, and statistics related to rural infrastructure projects and their impact. Look for websites of relevant departments in your country.

International Organizations:

Organizations like the World Bank, United Nations, and International Monetary Fund often provide data on rural development and infrastructure projects worldwide. They may also offer case studies and reports on successful projects.

Research Institutions and Think Tanks: Academic institutions and research organizations may conduct studies and publish reports on rural development and infrastructure. These reports often include data, analysis, and recommendations.

Non-Governmental Organizations (NGOs): NGOs working in rural development may have on-the-ground data and case studies showcasing the impact of infrastructure projects on communities.

Statistical Databases: Many countries have centralized databases that provide statistical information on various aspects of development, including rural infrastructure. Examples include the U.S. Census Bureau and Eurostat for European Union countries.

Academic Journals: Scholarly journals in fields like development studies, economics, and geography may contain articles with data-driven insights into rural infrastructure development.

Industry Reports: Industry associations and consulting firms might produce reports on rural infrastructure, especially in sectors like agriculture, energy, and transportation.

Local Government Reports: Local governments often produce reports on infrastructure projects and their effects on rural communities. These reports can offer valuable insights.

Community Surveys: Surveys conducted within rural communities can provide firsthand data on the impact of infrastructure projects on residents' lives.

IV. Significance Rural economy in India:

The rural economy in India plays a crucial role in shaping the country's overall development trajectory. With a vast majority of the population residing in rural areas, the significance of the rural economy cannot be overstated. This essay explores the multifaceted importance of the rural economy in India, highlighting its impact on livelihoods, agriculture, employment, poverty reduction, and national growth.

India's rural economy is characterized by a diverse range of activities, including agriculture, agribusiness, traditional crafts, small-scale industries, and services. These activities collectively contribute to the country's socioeconomic fabric and have far-reaching implications for both rural and urban areas. Here are some key aspects highlighting the significance of the rural economy in India:

1. Agriculture and Food Security:

Agriculture forms the backbone of the rural economy in India, providing livelihoods for millions of farmers and agricultural laborers. The sector not only contributes significantly to the Gross Domestic Product (GDP) but also ensures food security for the nation. The cultivation of crops, livestock rearing, and fisheries contribute to rural incomes and play a critical role in addressing nutritional needs.

2. Livelihoods and Employment:

The rural economy supports a substantial portion of the Indian population by offering diverse livelihood opportunities. While agriculture is a primary source of employment, rural areas are also home to cottage industries, handicrafts, weaving, and traditional occupations. These activities offer livelihoods to artisans and skilled workers, contributing to the preservation of cultural heritage.

3. Poverty Alleviation: The rural economy is closely linked to poverty alleviation efforts. As a significant portion of the population lives in rural areas, inclusive and sustainable rural development is essential to lift

people out of poverty. Providing rural communities with access to education, healthcare, sanitation, and skill development can contribute to poverty reduction.

4. Rural-Urban Linkages:

The rural economy has a symbiotic relationship with the urban economy. While rural areas supply agricultural products, raw materials, and labor to urban centers, they also serve as markets for manufactured goods and services. This interdependence highlights the need for balanced development between rural and urban areas.

5. Agribusiness and Value Addition:

Apart from primary agriculture, agribusiness and value-addition industries play a significant role in the rural economy. Processing, packaging, and marketing of agricultural products add value and create employment opportunities. These activities also enable farmers to fetch better prices for their produce.

6. Environmental Conservation:

Rural areas often harbor natural resources such as forests, water bodies, and biodiversity. Sustainable management of these resources is essential for environmental conservation. Many rural communities rely on these resources for their livelihoods, necessitating their protection.

7. Infrastructure and Connectivity:

Investment in rural infrastructure, such as roads, electricity, and communication networks, contributes to improved connectivity and accessibility. Better infrastructure enhances market access, reduces transportation costs, and enables the flow of goods and services.

8. Traditional Knowledge and Culture:

Rural areas are repositories of traditional knowledge, cultural practices, and indigenous wisdom. The preservation of these aspects is crucial for maintaining diversity and fostering a sense of identity among rural communities.

9. Social Stability and Cohesion:

The rural economy can contribute to social stability by providing livelihood opportunities close to home, thereby preventing mass migration to urban areas. This, in turn, helps maintain social cohesion and familial ties.

10. Agricultural Innovation and Research:

The rural economy drives agricultural innovation and research. Farmers' practices and local knowledge develop region-specific solutions for sustainable farming and food production.

Finally, India's rural economy shapes its socioeconomic landscape. It covers livelihood, agriculture, employment, poverty alleviation, culture, and growth. The rural economy's full potential requires sustained efforts to encourage rural development, improve infrastructure, improve education and healthcare, and ensure equitable resource allocation. India's holistic and inclusive development requires balancing rural-urban dynamics and understanding their complex relationships.

India is the world's most populous country and the 5th most developed. Two thirds of the population live in rural areas, where agriculture provides livelihoods and boosts the economy. Rural areas saw enormous reverse migration during COVID-19, demonstrating that rural economies are still the backbone of national economies. People felt rural life was cheap and sustainable during the pandemic. The rural economy includes agriculture, forestry, fishing, aquaculture, handicrafts, dairy, tourism, mining, transport, trade, repair and construction, community, and personal services. These activities can be diversified modernly with modern infrastructure. The lack of sustainable modern infrastructure is the biggest obstacle to reforming the rural economy to enhance the national economy and make it self-sufficient. Given its diverse geographic, geographical, climatic, and socio-cultural characteristics, rural India has great potential for non-farming activity-based economy.

Handicrafts and handlooms from across the nation are exported far. Rural folks offer most labor-intensive urban services. Rural locations have several small-scale manufacturing enterprises that require little expertise. Forestry or forest goods including honey, wax, wood, and some natural remedies are alternative rural self-employment or business opportunities.

V. Need for Rural Development

Any economy needs rural development to achieve sustainable development in economic, social, and environmental terms. According to the 2011 Census, more than two-thirds of India's population lives in 6.4 lakh villages. One-third of India's poor are rural, including Scheduled castes, Scheduled tribes, landless labourers, and casual workers who lack financial resources, land, assets, property, and other resources. In July 2010, UNDP, and Oxford University's Multidimensional Poverty Index [MPI] found 645 million Indians, or 55%, to be poor.

Rural communities face many social, economic, infrastructural, healthcare, education, sanitation, and other issues. Poverty, illiteracy, unemployment, homelessness, social evils, inferior living standards, etc. are important issues in rural areas. These difficulties worsen if not handled, affecting the country's overall development.

VI. Sustainable Development Goals and Rural Development

The SDGs focus on No Poverty, Zero Hunger, Good Health and Well-being, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation, and Infrastructure, Sustainable Cities and Communities. Promoting rural development reduces pressure on urban centers since rural areas provide important services and economic possibilities. All rural development activities are vital for accomplishing Sustainable Development Goals since SDGs focus on rural communities' specific needs that help create a more sustainable, inclusive, and equitable world by conserving the environment.

UN Sustainable Development Goals are due by 2030. UNO evaluated the Millennium Development Goals (MDGs) in 2015 and concluded that they fell short for many people, especially the poor and those disadvantaged by gender, age, disability, or ethnicity. MDGs were also considered excessively limited. The UN created the Sustainable Development Goals (SDGs) after extensive deliberations. The SDGs address gender inequity, climate change, and more. The 19 goals and 169 targets share the goal of eradicating poverty. Two thirds of the country's poor live in rural areas, so "Eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development," according to the SDGs' preamble. Rural development is key to SDGs.

Four of the six Sustainable Development Goals focus on people and plans. Regarding individuals, they prioritize promoting healthy lives, knowledge, and inclusion for women and children.

2. Eliminating poverty and inequality to uphold human dignity.

3. Building a dynamic, inclusive, and transformational economy. Planning prioritises ecological protection for all societies.

Focus area 8 emphasizes inclusive and sustainable economic growth to end poverty and achieve shared prosperity. Infrastructure expenditures like roads, energy, and communications enable this. In focus area 10, infrastructure, improving water supply systems, developing irrigation and water harvesting and storage infrastructure for agriculture, access to modern energy services, reliable transport, and communications, including road and rail links, ports, and ICT connectivity, and technical and financial support for adequate infrastructure operation and maintenance are essential. Focus areas 11 through 13 encourage women to work, migrate from informal to formal jobs, and improve lives by providing affordable housing, infrastructure, and essential services. Focus area 19 seeks peaceful and non-violent civilizations through equality within and between countries, which requires basic infrastructure for rural areas to grow as well as urban centers.

Nobel Memorial Prize-winning economist Robert M. Solow interpreted sustainable development nuancedly. Sustainability, he says, is fair distribution of well-being and capacity between present and future generations, not natural resource equity. He says intergenerational equity is the capital we leave behind, not the natural resources we extract. He prioritizes intra-generational equity, or equity between contemporary populations, while ensuring equal well-being and capacity for future generations. Thus, environmental conservation reduces consumption, promotes capital investment, and improves human welfare. Solow's definition of "sustainable development" includes the development of rural infrastructure through investment strategies that promote knowledge, technology, infrastructure, and innovation.

VII. Migration related issues

Urban areas grow rapidly, whereas rural areas do not. This is the main cause of rural-to-urban migration. Villagers leave their homes, land, and ancestral riches for different reasons. Employment migration and village evacuation are frequent in Uttara Khand, Bihar, and Uttar Pradesh. After arriving, migrants suffer until they find jobs. Their quest for survival sometimes leads to crime. Now is the moment to educate them about policies and funding. Their development by the government can stop rural migration. Due to migration, metropolitan regions must provide more civic facilities.

VIII. Covid-19 experiences

Urban-oriented and affluent activities suffered during Covid-19. Domestic and foreign hospitality and tourism plummeted due to travel restrictions and lockdowns. Tourism-related businesses like hotels and restaurants lost a lot. Cinemas, theatres, and music venues closed, costing the entertainment and events industry. Daily wage labourers, many of whom are informal sector workers, lost income, and work possibilities during lockdowns. Many rural migrants lost jobs and fell into poverty. This phase allowed rural agriculture to continue without restrictions and helped reverse migrant people. This experience also makes us rethink rural development and diversification for sustainable livelihoods.

IX. The concept of Sustainable Rural Development

The understanding that current economic actions may affect future generations has brought Sustainable Development to focus. Previous policies have not prioritized environmental efficiency and quality to support human development and quality. Overemphasizing GDP growth caused environmental deterioration that threatened future development. This forced economists and policymakers to reassess economic development considering environmental implications on future generations. This sparked global interest in Sustainable Development (SD). This approach rethought economic development. Development sustainably "Improvement in living standards without sacrificing the ability of future generations to enjoy at least the same standards" This indicates that present development activities should not damage the earth's natural capital, resource base, or waste-absorbing capability. Sustainability emphasizes resource parity between rich and poor, urban, and rural, and intra-generational. Today, we must approach the environment and rural development as interdependent and develop eco-friendly technology for sustainable development.

X. The concept of Sustainable Rural Development

Rural development refers to rural residents' socioeconomic development. It is a long-term approach to improve rural people's economic and social well-being. Sustainable rural development requires modern rural infrastructure.

Sustainable Rural Development is a long-term process that improves the quality of life for the rural poor by developing capacities and providing opportunities that promote community participation, health and education, food security, environmental protection, and sustainable economic growth, allowing community members to escape poverty and fully live sustainable lives. There are four steps: diagnostic, consensus building, planning, and implementation.

Sustainable Rural Development focuses on community participation, water and sanitation, health and hygiene, poverty reduction and disease control, food security and agriculture, greater survival prospects for mothers and their infants, education and equal opportunities for women, conservation and environmental protection, infrastructure development for economic development, and science and technology.

XI. Role of Rural Infrastructure in Rural Development

Any country's economic growth depends on adequate and high-quality infrastructure. Infrastructure facilities are intermediate inputs that reduce input costs and boost profitability, increasing output, income, and employment. Rural infrastructure is essential for sustainable development. These infrastructures underpin rural economic, social, and environmental growth.

Economic development in every country has always preceded infrastructure development. Hirschman, Rodan, Nurkse, Rostow, Gunnar Myrdal, etc. funded development strategies. Infrastructure facilities must be developed before or after Direct Productive Activities (DPA). Prof. VKRV Rao believes infrastructure development should be a continual process that adapts to technology advances. Besides conventional services, they include numerous new ones related to the production and marketing of diversified commodities and services in dynamic, globalized economies.

Rural India has great potential for growth, but basic utilities are needed to make them self-sufficient and competitive with cities. Apart from credit, essential facilities include roads, hospitals, schools, irrigation canals, water supply, power, and telecommunication. The 1997 World Bank report found that substandard roads and storage facilities alone lose 15% of crop produce between the farm gate and the consumer, hurting farmers' revenue. Absence or bad infrastructure hinders agricultural commercialization.

Poor infrastructure in rural areas hinders human and material mobility and rural development. Rural infrastructure, especially agricultural infrastructure, can make Indian farming the most modern, commercial, and active. Modern, diverse infrastructure is essential for modernization, diversification, and sustainable rural development.

Several studies and analyses on rural development and infrastructure recognized the relevance of rural infrastructure in enhancing agricultural output, farm and non-farm employment, rural poverty, and rural living

standards. It is well known that rural infrastructure including irrigation, road transportation, institutional finance, and power is essential for rural economic diversification and sustainability.

Depending just on agriculture doesn't provide enough jobs or money. This requires rural economic diversification. The rural economy has various non-farm sectors with dynamic links to its growth. Animal husbandry, fishery, horticulture, rural industrialization, organic farming, food processing, etc. can generate long-term income. These sectors need modern infrastructure including reliable electricity, connectivity, cold storage, marketing links, and other services.

XII. Efforts in the Development of Rural Infrastructure in India

During pre-independence period

Rural development experiments were made by individuals and institutions before independence. Sir Daniel Hamilton's 1903 model village in Sunderban (Bengal), Thakur Rabindranath Tagore's 1920 Sriniketan experiment, Brayne's 1921 Gurgaon experiment, Krishnamachari's early 1930s Baroda Reconstruction Movement, Gandhiji's Champaran (1917) and Sevagram (1936) experiments, and The Firka Development Scheme in Madras State in 1946 are examples. These endeavours guided future rural development programs.

Government's Efforts in India Since Independence

The Indian government recognized the importance of infrastructure in development and the constraints of private investment flows into rural infrastructure development due to extended gestation and low profitability. The state developed infrastructure and the public sector took responsibilities.

After Independence, India's Community Development Projects began with Albert Mayer's 1947-48 Etawah Rural Planning and Development Project. Later, many rural development programs and plans focused on poverty eradication, job creation, and physical and social infrastructure for communities and individuals. The central government's rural poverty alleviation programs targeted small and marginal farmers, landless labourers, and rural craftsmen.

The major Efforts

Apart from MGNREGA-2006 (which guarantees 100 days of employment per year), IRDP, launched in 1978-79, was expanded to all development blocks in 1980-81., FFWP—The Food for Work Programme was created in April 1977 to provide subsidized food grains to rural poor. Training Rural Youth for Self-Employment (TRYSEM) began in August 1979 to teach rural youth technical skills. NREP began in October 1980. On August 15, 1983, RLEGP was founded to create more rural jobs, especially for landless workers. JRY: Jawahar Rozgar Yojna was introduced in April 1989. JGSY is its restructured form. This program began in 1999. Antyodaya Program, The Drought-Prone Area Program was launched during the mid-term appraisal of the Fourth Five Year Plan for drought-prone areas. The Desert Development Program was launched in 1977–78, DWCRA was introduced in 50 districts in 1982–83, and EAS was launched in 1983 and expanded in phases to cover the entire country in 1996. Its main goal was to improve rural women's socioeconomic status by creating self-sustaining income-generating activities in a district. PMRY: The Prime Minister's Rozgar Yojana is a self-employment scheme for educated unemployed youths launched on October 2, 1993. The 2002 Jai Prakash Rozgar Guarantee Yojana guarantees work to unemployed people in the poorest parts of the country. NSAP: The central government created the National Social Assistance Programme to help poor households. The program began on August 15, 1995, and includes the National Old Age Pension Scheme, National Family Benefit Scheme, and National Maternity Benefit Scheme. Rural Housing Scheme: Indira Awa Yojana began in 1985. Free houses are supplied to SC/ST families and bonded laborers under this scheme.

Efforts During five-year plans

In the first five-year Plan, India prioritized agriculture, including irrigation and power, because the country lacked fundamental amenities like transport, communication, irrigation, and power. The rural agriculture sector was prioritized. The building of highways connecting all villages to urban centers required initiative. The Sixth Five-Year Plan stressed the need for large public investment in rural infrastructure and more equitable economic growth in rural areas. The Eighth Five Year Plan emphasized rural economic (energy, transport, communication, irrigation) and social infrastructure (health, education, water supply, sanitation, and sewage). Over 70 years of planned economic growth, rural infrastructure has grown in the country.

Special initiatives

The Central Government created the Accelerated Irrigation Benefit Program (AIBP) in 1996-97 to speed up irrigation/multi-purpose projects. Complete irrigation/multi-purpose projects to increase irrigation facility capacity. 'Bharat Nirman' contains six rural infrastructure development components.

The Rajiv Gandhi Grameen Vidyut Karan Yojna (RGGVY) was established in 2005-06 to electrify all rural households over four years.

The 100% central subsidy Pradhan Mantri Gramme Sadak Yojana (PMGSY) was introduced in 2000 to provide all-weather connectivity to eligible unconnected rural habitations. Rural Infrastructure Development Fund (RIDF) was created with NABARD's backing to help State Governments complete projects that were unable to be funded. MGNREGA took effect on February 2, 2006.

In 2015, Deendayal Upadhyaya Gramme Jyoti Yojana (DDUGJY) was started to efficiently distribute power to rural agriculture and non-agriculture sectors.

Pradhan Mantri Ujjwala Yojana (PMUY) gives deposit-free LPG connections to disadvantaged women in rural regions by providing clean cooking fuel. Sahaj Mantri Bijli Har Ghar Yojana. Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya) promises free electricity to all rural and urban poor families, including APLs. Pradhan Mantri Awas Yojana (Gramin) to offer pucca dwellings to rural homeless and decrepit households with basic facilities for a dignified existence. Jal Jeevan Mission (Har Ghar Jal) aims to deliver safe and adequate piped water to all households by 2024. Swachh Bharat Mission (Grameen) to maintain open defecation-free behavior.

Present State of infrastructure in rural India

Despite the aggressive growth in the last few years, India's basic infrastructure is ranked 86 in the global Competitive Rank. The quantity and quality of infrastructure facilities are substantially lower in rural areas than in urban areas. Even though the significance of infrastructure for rural development is well recognized, alarming deficiencies persist in rural infrastructure across Indian states. The efficiency in terms of adequacy and quality of infrastructure facilities is substantially lower in rural areas.

In the study conducted to evaluate Infrastructure and Development in Rural India, by Madhusudan Ghosh of Visva-Bharati University, Santiniketan, it is found that at the national level, rural infrastructure facilities are found to have improved significantly, however, the status of rural infrastructure is far from satisfactory. The study found the status of rural infrastructure regarding the following facilities.

Rural Roads: At the national level, road density improved from 57.04 km in 1991 to 92.04 km in 2008; and the proportion of surfaced road to total road increased from 42.4 percent in 1981 to 59.8 percent in 2011. The situation improved across all states, but there were wide inter-state variations in both indicators in all the years.

Telecommunications: The level of tele density was very low till 2006 after which there has been a remarkable improvement.

Power and Housing: The target of achieving universal access of rural households to electricity appears to be far from reality. At the regional level, there are widespread disparities among the states regarding access to electricity. It was found that the situation improved marginally in 2011. **Water and Sanitation:** The proportion of irrigated gross cropped area increased, supply of safe drinking water was impressive, but in case sanitation conditions were disappointing, only 30.7 percent of households had access to toilets within their premises even in 2011.

Education and Health Infrastructure: It was also found that there is a wide range of inequalities in this regard.

XIII. CHALLENGES

Challenges Faced in the way of Rural Infrastructure Development

Infrastructure projects, notably rural ones, require large initial inputs, long gestation periods, high incremental capital-output ratios, high risk, and low ROI. The private sector cannot enter infrastructure due to these factors. Additionally, several infrastructure characteristics make it challenging to design, build, run, and maintain these services. Because of this, the public sector provides most infrastructure services worldwide. Despite public infrastructure development projects in rural India, amenities are still inadequate, and progress has been uneven between states.

Rural infrastructure expansion is hindered by low population density, family incomes, and economies of scale. There are major hurdles in developing rural infrastructure. The financial, human, and management resources for rural development programs are insufficient. Lack of a comprehensive vision of programs during design and implementation causes conflicts in program objectives and failure to achieve planned results.

Many rural development instruments are poorly chosen and do not meet their goals. They waste public resources and delay goals. Today, political parties prioritize party interests over national interests. Implementation workers are underpaid, undertrained, and unmotivated.

XIV. Suggestions:

- To overcome these rural challenges, the following suggestions may be considered.
- Spreading awareness is essential to increase the status of the rural economy. Small startup funds and grants for small industries should be encouraged.
- Providing essential facilities and better alternatives can step up the level like the installation of solar panels and turbines for electricity.
- Encouragement and promotion of innovative technologies made by local people.
- Efficient governance and management for deriving intended benefits.
- Rural industrialization, Diversification of rural economy, and encouraging Labour Intensive Techniques. In India, we have more possibilities of tapping non-conventional energy sources.
- We have more sun days in a year all over the country covering all corners and there is a high possibility of tapping solar energy which is a sustainable source that can be put to multiple uses in individual domestic needs and community level uses in rural areas. It is capable of not only reducing dependence on conventional energy sources but also reducing pollution and preserving environmental efficiency for future generations.

XV. Conclusions and suggestions

Sustainable Economic and social growth of rural people alleviates poverty, creates jobs, invests in human development, improves technology, preserves environmental efficiency, social security, and safety. Indian rural development is one of the most pressing issues of our time, and the government must act to improve rural areas and the lives of rural people. Only by taking the correct steps to improve rural residents' social, economic, and living conditions can India develop rural areas. Infrastructure development depends on facility level, quality, maintenance, and management. To provide rural infrastructure services, local-level institutions should improve governance, delivery systems, and efficiency.

Governments must allocate enough funds in their annual budgets, and implementing agencies like banks must be concerned, committed, and accountable to build village infrastructure on schedule. As part of the right to information, local print and electronic media should report program/scheme performance monthly. Finally, eminent Indian environmentalists and Chipko movement leaders advised us.

"You have to decide whether development means affluence or whether development means peace, prosperity, and happiness". - -Sundar Lal Bahuguna

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