**K.T.S.P Mandal’s**

**Hutatma Rajguru Mahavidyalaya, Rajgurunagar**

**Tal.Ked, Dist.Pune.410505**

**DEPARTMENT OF BBA**

**SYBBA**

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**SUBJECT – FUNDAMENTALS OF RURAL DEVELOPMENT**

**PROF. L. S. SALUNKE**

**Chapter No. 4 Information Technology and Rural Development**

**4. INFORMATION TECHNOLOGY AND RURAL DEVELOPMENT**

**Introduction**



Mankind has evolved through new technologies and know-how, right from the Stone age starting with invention of fire to wheel to steam engine. It is said that the 21st century is the Information Age, where digital technologies such as Computers and Internet will be playing a key role in the lives of human beings. We make use of diverse set of technological tools and resources to communicate, and to create, disseminate, store, and manage information.



ICT (Information and communication technology) is an umbrella term which encompasses any communication device or application, such as radio, cell phones, television, computer, satellite systems and several other applications associated with them. ICT has played a great role in the development of modern India. Today, ICT in some or the other form is used by almost all the professionals. In several sectors such as Banking, healthcare, manufacturing, applications of IT are used. Use of ICT has made its way in the functioning of Government as well, and made Government services more efficient and expanded its reach to people. ICT has greatly contributed to economic growth of the country in a myriad of ways. In fact, almost every task of routine life today involves use of Information technology in one or the other way.

Rural development is a systematic ongoing process of improving the quality of life of people living in rural areas on socio-economic front. Rural development has been on Government of India's agenda right from Independence. To achieve it, GOI had formulated several programmes for rural development. However, they have not yielded desired results. Rural areas are still far away from holistic development. In order to bring efficiency and transparency in several rural development projects, use of Information technology is the need of the hour. Information technology contributes to qualitative and quantitative changes in rural life style. With Information technology emerging a key force for economic development and growth, GOI (Government of India) is focusing on making India a Digital economy, which can help the sustainable development of rural economy by impacting production, operation and expansion of market, thereby reshaping the rural economy. Information technology leads to:

(i) Innovation.

1. Advent of new market.
2. Employment opportunities.

# **Rural Development and internet**

The World Wide Web (Internet) has influenced the human civilization in a big way. Today, the role of Internet is visible in almost every sphere of life, may it be the way individuals socialize, create and exploit economic opportunities and knowledge resources. The major part of rural India is still ignorant and desperately seeks to partake in the benefits of digital and high-tech development. The good thing is that Internet has made its way in rural India as well, albeit the, speed is slow and reach is likewise limited.

Rural areas do not have adequate educational, communication, transportation and healthcare facilities. Even employment opportunities are quite limited information related to jobs is not easily available to rural populace. In case of disasters such as floods, earthquakes, or epidemic, it is difficult to contact other organizations for help. Internet can play an important role in this context in rural areas, by providing seamless contact and transfer of information.

Utilization of Internet technology has the potential to easily sort out several problems in villages. These are as detailed as follows:

1. **Growth of Rural Enterprises:**

Availability of IHYPERLINK "https://www.airtel.in/broadband/"nternet service provider and the resultant enhanced connectivity will enable cottage industries and small scale industries in rural areas to reach potential customers directly. This will provide a tremendous boost to rural enterprises, as they will be able to serve their existing customers better. Also, connectivity and information sharing will help them to add new customers.

1. **Regional Rural Development:** 

With proliferation of technology such as Internet in rural areas, citizens become aware and are better able to understand their rights and responsibilities. Essential services such as banking, transportation, education and healthcare improve with progression of Internet in these areas, and the region flourishes as a whole.

1. **Reduces Migration:**

It has been seen that rural folks migrate to cities in search of job opportunities to earn their livelihood. If the rural areas are developed and offered employment and income Opportunities via Internet connectivity, worldwide communications, then there would be lesser cases of migration of rural people.

1. **Closer World:** 

With Internet, the means of communication can enhance and bring rural areas closer to the world. This is a significant step towards rural development.



**5. Empowerment of People:**

Government introduced digital services in rural areas with a view to empower people by increasing their awareness and providing them information about various Government schemes a in rural areas was to empower individuals. For example, e-banking services can bring information and transparency regarding various banking facilities and process therein, including loans.

* 1. **Increase Literacy Rate:**

In rural areas, schools are generally located quite far. Internet has the ability to remove constraint of distance, when it comes to teaching. Online teaching facilities will bring about widespread literacy in rural areas. In rural areas where schools can be at quite a distance, thus, the Internet can help increase literacy rate of rural areas. 



* 1. **Agriculture:**

Agriculture is the core occupation in rural areas. Internet provides an opportunity to farmers to gain an intricate understanding of their own business alongwith the ways in which they can improve their yield. Apart from this, Internet can reduce exploitation of farmers by offering them information and guidance as regards to market price of various agricultural products, and facilitating their direct interaction with customers.

* 1. **Community Development:**

Internet provides an exposure to awareness and rationale, which facilitate individuals to make better decisions. Internet results in social welfare by making people ware about social  issues and encouraging them to give up faith in superstitions, and to treat individuals from different caste, creed, gender on an equal level.

**Hindrances:**

However, there are certain factors which have hindered the efficiency and gains in rural areas, which should have come due to Internet technology:

* + - Poor Internet penetration rates in rural areas.
		- Low levels of developments of institutional infrastructure such as schools, libraries, hospital, and emergency services.

**Information and communication Technology (ICT) – The Concept**

* ICT refers to technologies that provide access to information through telecommunication. ICT includes the following.
* Wireless networks
* Cell phones, and
* Other communication mediums using Internet and telecommunications technology
* ICT includes products that sfore, process, retrieve, transmit, convert, duplicate, or receive electronic information. For example: Computers, digital television, mobile phones, Email, robots etc.
* Revolution in Information and Communication Technologies revolution, in combination with economic, social, cultural and political responses, has far reachingimplications in the whole of India, including rural areas.
* The foremost objectives of ICT in rural development are to bring efficiency, openness and responsiveness along with participation in the formulation and implementation of rural development programmes by the people.
* It is true that the actual reach and penetration of various information technologies is  still very limited in rural areas.

 Information and Communication Technologies such as mobile phones, computers, satellite, cable televison and Internet, are bringing about significant changes in the rural India.

* Today's communication technologies are able to combine characteristics of both interpersonal communication and mass media, so as to provide free flow of messages between the participants, and immediate feedback.
* The convergence and integration of communication technologies have facilitated interactive communication between people, and provides them with a much greater control over the process of information exchange.



**ICT and Rural Development**

Rural development refers to improving standard of living of people residing in rural areas on a sustainable basis and making them self-reliant. In information age, ICT has a huge role in rural development.



ICT assists the development of rural areas with regards to the following pointers:

* **Information on agricultural equipments**: Provide information to farmers regarding availability and prices of tools and machinery required in agricultural activities Thus, farmers can procure a new machine. which will lead to efficiency in agricultural related activities.
* **Information on agricultural inputs**: ICT can provide information about the markets from where a farmer can procure various agricultural inputs 'such as high quality seeds, pesticides, fertilizers, insecticides etc.
* **Online media for selling agricultural products**: A farmer can use online channels to sell his products, which saves time and energy. Moreover, online media allows farmers to get access to a large number of buyers 
* **Agro-tourism**: ICT can help in promoting tourism, especially Agro-tourism. Several media can be used to create an interest in the minds of people. Tourism in rural areas can lead to economic development of that particulat village, as well as employment and income opportunities for people.
* **Education**: People in villages can get an opportunity to learn and educate themselves if ICT programmes are developed for them. This helps in enhancing

literacy rates in village.

**Health services**: ICT can play a vital role in enhancing the quality of healthcare facilities and medical services in the villages.

**Women empowerment**: Through ICT, women can get education and information regarding health care, farming, and manufacturing of agro based products, Self-help groups in the vicinity and handicrafts. Such knowledge empowers women to uplift their status in the society,


**Importance of ICT in Rural Development:**



ICT is expected to shape rural areas as follows:

1. **Social transformation**: ICTs facilitate access to information and knowledge, without  considering social and economic status of an individual. ICT plays an important role in bridging the information gap between people of different regions, or strata. As  even poor people can get access to knowledge and information, social transformation can be achieved, thereby leading to economic development. It is  rightly said, 'Technology is a great leveller'.
2. **Implementation of rural development initiatives**: ICTs strengthen efforts towards implementation of rural development initiatives through demand — driven  information and communication services.
3. **Governance**: E-governance eases access of information about several Government  services. As a result, it improves transparency, accountability and administrative efficiency of rural institutions. Moreover, people can participate and reap benefits of such programmes by entering a few details at the comfort of their homes.


4. **Standard of living**: Application of ICT has the potential to improve living standards  of people in remote and rural areas by providing vital commercial, social and educational benefits. ICT has resulted in better quality of life for rural people by providing them with access to markets, health services and education.

1. **Modernization of agriculture**: Through ICT, people become aware about the  techniques used in modern farming and its benefits. As a resultt they are more likely to switch to modern farming, resulting in enhanced agricultural productivity,
2. **Support local governance**: ICT initiatives may be designed to provide support to local governance, in terms of:
* Taking several initiatives and their information online.
* Creating awareness in people,
* ICT being interactive in nature can also facilitate local authorities to respond to queries generated by local needs of the rural communities.
1. **Awareness**: ICT is used for strengthening the information base of rural communities. ICT improve access to information by rural poor regarding their rights, and availability of government schemes, Such awareness can help people to take benefits of such schemes and improve their lives and livelihoods. As an instrument of awareness creation and feedback, ICT provides rural people a voice in nation's socio. political life.
2. **Enhancing people's participation in nation building process**: ICT mobilizes people and seek their willing participation in the development process of a country. ICT facilitates information, education and training to people, so that they can be instrumental in nation building activities.
3. **Marketing of rural products**: Products produced by farmers, artisans, craftsmen, cottage industries and small scale industries in rural areas such as handicrafts and  Agro-based products can be advertised via the internet to the global consumers.

# **Application of ICT in Rural Areas**

GOI has taken a number of initiatives in rural areas and has made use of ICT in them, so as to make reach Government services and information to maximum people in a cost-effective manner.

They are detailed below:

1. **DD Kisan Channel**: DD Kisan Channel broadcasts dedicated programmes on agriculture, along with an innovative content in this field Social media such as Facebook and WhatsApp have resulted in wider promotion of this channel, especially in rural India.

2. **Vigyan Prasar**: Vigyan Prasar is an autonomous organisation of Department of Science and Technology, Government of India which is •involved in public outreach for Science and Technology communication. Vigyan Prasar organises street plays, puppet shows and science exhibitions in rural areas to create awareness and knowledge about scientific methods and techniques in agriculture.

3. **Kisan Vikas, Kendras (KVK)**: KVKs are instrumental in demonstrating new technology at district level, thereby serving as a link between scientific community and the Indian farmer.

1. **Gyan Vani community radio**: The Human Resource Development Ministry and the Indira Gandhi National Open University with the help of Prasar Bharati launched Gyan Vani Community Radio in 2001. It covers a wide range of subjects for empowering rural areas, which include:
2. **Mera Gaon Mera Gaurav**: In this schemes, Agri-Scientists go to villages and help farmers adopts new technologies, Effective use of ICT can be made through  facebook and whatsapp.

6. **Skill India Mission**: Considering the urgent need to make the work force in India

technically skilled in their respective areas of vocations and occupations, GOT launched by Hon'ble Prime Minister, Shri Narendra Modi on 15 July 2015.

 **Impact of ICT on Rural Areas**

Several research studies indicate that ICT has an overall positive effect on the lives of people in rural areas. ICT has lead to an increased awareness along with socio-economic empowerment of rural masses. A few positives and negatives about ICT are discussed below:

**Positives :**

* ICT can be used to efficiently maintain electronic health records, which results in improvement in healthcare services.
* Awareness about Government schemes and projects for rural people.
* Online selling results in an increase in farmer's income and ease the process of finding genuine buyers.
* People are able to avail Government services without waiting for long queues. For example: Computerized land records.

**Negatives:**

* Huge initial investment. 
* Maintenance costs.
* Lack of training and awareness amongst rural folks.

 **Hindrances to Proliferation of ICT in Rural Areas**

There is no doubt that ICT has the potential to accelerate development of rural areas, and transform lives of rural folks. However, there are certain obstacles which are coming in the way of proliferation of ICT in rural areas, as listed below:



* **Infrastructure**: Poor ICT infrastructure like electricity, internet technology and methods of communications in rural areas influences speed and hence, the implementation.
* **Awareness**: Lack of ICT awareness amongst agency officials working in rural areas.
* **Language:** Local language issue, as Internet platforms have dominance of English language.
* **Literacy**: Low literacy in rural areas makes it difficult for ICT to proliferate there. Particularly, technical literacy is quite low in rural India. There is a definite connection between education level and use of electronic means or Internet, and lack of technical  awareness renders rural folks incapable of using the services provided by the  government.
* **Poverty**: Poverty in rural areas makes ICT products unaffordable, Poor people have to make great effort even for their daily living. Hence, it becomes obvious that accessing the Internet is a costly issue for necessary communications in the form of installing the required telephone lines needed for internet.

**IT Enabled Services (ITES)**

* IT Enabled Services are human intensive services that delivered over telecommunication networks or the Internet to a range of users.
* A peculiar feature of ITES is that it provides IT services to users who do not know IT. ITES greatly increases the employment opportunities as well.
* ITES includes a range of services such as e-Governance, data management, telemedicine, data digitization and website services.

**ITES application - E-governance :** 

* E-governance is the term used for effective use of Information & Communication Technology (ICT) to provide Government services to the citizens.
* Through E-governance, Government can enhance the range, quality of information  and services provided to the citizens in a cost effective manner.

 E-governance aids in delivering Government-to-citizens (G2C) services in rural areas in a convenient, efficient and transparent manner.

* E-governance is the application of Information Technology to the processes of

government functioning to bring about SMART governance. 

Governance a high priority agenda for Indian Government, as it is considered to be the most effective means of taking Government services to the rural areas,

* E-governance can facilitate Minimum Government, Maximum Governance'
* GOI has already come out with NeGP (National E-governance Plan) through which it aims to achieve the following objectives:
* Wi-fi for 'public in cities having pop > 10 lakh.
* Internet penetration in 2.5 lakh villages.



* Passport moved to cloud.
* 250000 Govt. schools to be connected to Broadband and Wi-fi.
* All school books available in electronic version. 

Several E-governance services include:

* Basic citizens services such as online registration of birth/death/marriage certificates.
* Health care services.
* Education services.
* Computerization of land records.

## **ITES Applications for E-village**

Today, an attempt is made to proliferate IT and related applications to the nook and corner of the country, including the remotest rural areas. Following are a few initiatives in this regard:

1. **Agriculture Information System (AIS):** AIS facilitates the reach of agriculture and related information to farmers. Different Information Processing Tools retrieve and disseminate important information such as situation of natural resources, environment deterioration, soil erosion, deforestation, etc. 

1. **Digital India Initiative:** All Gram Panchayats will be connected through cable broadband under Digital India Initiative. This is with a view to solve the problem of Internet connectivity in rural areas.
2. **Kisan Call Centre:** Kisan Call centre is an expert advisory system, through which farmers can seek expert advice on different matters related to agriculture and allied sectors, through a toll free number. 
3. **mKisan SMS Portal**: In rural areas, Internet connectivity is a problem. However, people do possess mobile phones. Hence, GOI came up with mKisan SMS Portal fo r  farmers, which enables all Central and State government organisations in agriculture and allied sectors to give information/ services/advisories to farmers through SMS in their language. There is also a provision of facility to download various farming related apps from mKisan portal, 
4. **Kisan Suvidha**: Kisan suvidha is a mobile app developed to help farmers by providing them with relevant information to them quickly. This app provides the following information:
	* weather of current day.
	* weather next 5 days - market prices.
	* agro advisories. 
	* plant protection.
	* Integrated Pest Management (IPM) practices.
5. **Pusa Krishi**: This app is meant to provide farmers with information related to new varieties of crops developed by Indian Council of Agriculture Research (ICAR). Information on other relevant topics such as resource conserving cultivation practices and farm machinery is offered as well.
6. **Bhuvan Hailstorm App:** The app is used to capture crop loss due to hailstorm. This will reduce the delays in the payment of compensation to the farmers.

Agriculture Officer will go to the field with mobile or tablet loaded with this mobile app. The captured data will automatically be plotted to Bhuvan Portal and analysis can be done easily.

1. **Crop Insurance App:** The app is meant to provide information about government crop insurance scheme. The app can also be used to calculate the Insurance Premium for notified crops based on area, coverage amount and loan amount (if the farmer has taken loan).
2. **AgriMarket:** The app provides the market price of crops in the markets within 50 km of the device's location. Even, information regarding price of any market and any crop can be sought through this app through another option, in case one does not want to make use of GPS location.
3. **ITES tools in Rural Education:** ICT and ITES tools can be used in education sector,  to enhance the learning among the kids. For example, teachers can make use of computers and projectors to explain complex concepts to the students in a simple way.
4. **ITES in skilling teachers:** The Government is promoting use of ICT through 

Rashtriya Madhyamik Shiksha Abhiyan, under which teachers are trained in use of

ICT tools so that their attitude towards teaching may be reformed. The steps under this programme include:

* + establishment of smart schools, which shall demonstrate technology.

Provision for engagement of an exclusive teacher for ICT, who will train all teachers in use of ICT, and

  development of e-Content. 



* + National Award for teachers using ICT in Schools in the teaching learning process.
1. **E Basta:** This project under the aegis of Digital India Initiative is aimed to make school books accessible in digital form as e-Books, which can be read and used on tablets and laptops.
2. **ITES in skilling rural youth:** ICT can be used in skilling rural youth under various Government skilling programmes such as PM Kaushal Vikas Yojana, Skill India etc.

14. **ITES for Rural Healthcare:** Rural areas lack quality infrastructure, and face dearth of qualified medical functionaries. Moreover, poor in rural areas do not get access to basic medicines .Most doctors do not want to be posted in remote rural areas.

##  **Challenges of Rural Development**

Rural development is concerned with socio-economic development of rural areas and making rural masses self-reliant. However, there are number of challenges which still persist against this agenda. The same are detailed below:



* **Education and literacy levels**: Low literacy levels make it difficult for people to apprehend and thereby, make use of several Government schemes. The same also makes harder for people to find opportunities in non-agricultural sector.
* **Poor infrastructure**: Poor infrastructure facilities like water, electricity, transport, educational institutions, communication, health, storage facility etc. makes it difficult for rural people to travel, communicate and enhance their standard of living. For example, electricity problems and Internet connectivity problems prevent rural people from using ICT to the fullest.
* **Lack of awareness**: Rural populace does not possess sufficient awareness about the way to develop and especially take advantage of Government schemes. Lack of Awareness concerning advantages of E-Governance and the dominance of English on the internet bounds access of non-English-speaking Population. In the case of India, mostly population does speak in Hindi.
* **Poverty**: Rural areas consist mainly of poor people, and poverty reduces several opportunities. For instance, mechanized agriculture may not be possible due to poverty. Further, Poverty in rural areas makes ICT products unaffordable.
* **Traditional way of thinking**: People are still satisfied with the Old things and there is a resistance to change as they do hot want to put additional efforts to team; net" things.
* **Lack of technical literacy**: Technical literacy is quite low in rural India. There is a definite connection between education level and use of electronic means or Internet, and lack of technical awareness renders rural folks incapable of using the services provided by the government through e-governance medium. 
* **Lack of skills and knowledge**: Poor people lack knowledge and skills related to agriculture and allied activities. For example: optimal amount of fertilizers to be supplied, advanced farm machineries etc.
* **Small land-holdings**: Small land-holdings make it unfeasible for the farmer to have mechanized agriculture with use of modern tools and implements.

Inadequate marketing facilities: The farmer still sells most of his products to middlemen, who usurp huge margins. There exists a dire need to have widespread alternative marketing channels for agricultural produce.

* **Biased political will**: Many a times, local politicians have intervened in farmer's development projects, albeit negatively. Moreover, the political community has not made sufficient efforts to make farmers aware of various opportunities.