



ICT : Tool for rural development and its new initiatives

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India is a country of villages and agriculture is main occupation for them. According to the census of 2011, 68.84 per cent of the population of India is rural whereas 31.16 per cent is urban. These figures clearly indicate that India still breathes in villages. But even after more than sixty seven years of independence, illiteracy, poverty and backwardness in all terms still plagues rural India. The five-year plans of the central government largely aim at Rural Development. The Ministry of Rural Development in India is the apex body for formulating policies, regulations and acts pertaining to the development of the rural sector.

Agriculture, handicrafts, fisheries, poultry, and diary are the primary contributors to the rural business and economy. Information and Communication Technologies (ICTs) have transformed lives across India. It may be imperative to the progress or boost up of rural India for developing strategies. It may become an integral part in the information-flow for catalyzing the development efforts in rural

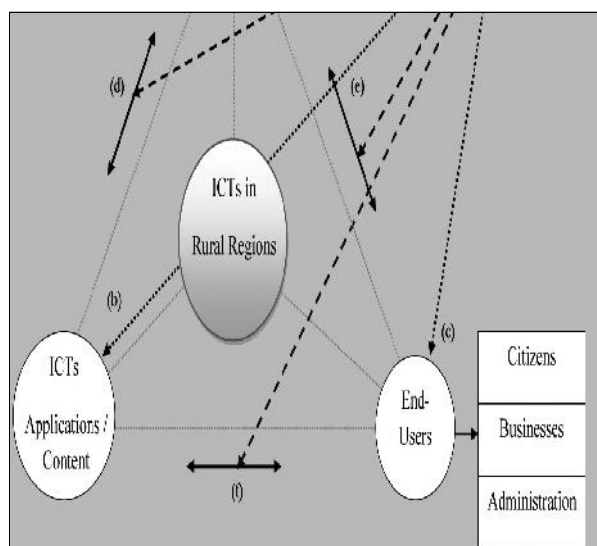
India and helps several strategies to achieve sustainable rural development. Realizing its importance in Indian rural development, several government projects have been implemented to achieve universal access to ICTs. These projects mainly focus on bridging the digital divide between the urban and rural areas of India. The urgency to bridge this divide mainly due to the fact that, rural areas still mostly lag behind the urban areas, when it comes to education, health and infrastructure. This kind of rural isolation can negatively impact growth, generate inequality of services and opportunities and in turn affect the sustainable development of the country. Rural people can connect

easily with the local, regional and national economy through the use of ICTs. They can make use of the banking facilities, agriculture related information, various government schemes and also access the various job opportunities which would otherwise be beyond their reach. Thus bridging the digital divide not only helps in bridging the infrastructural gap but also to bring the rural population to the forefront. The development-landscape has been transformed by the explosion of ICT, especially the mobile phone technology. This

technology has improved the life of the rural population by integrating the once isolated people into the economies and politics and tried to bring into mainstream of development. Here it is important to mention that ICT is not related with only item like the internet, computers, or telecommunications but it is a convergence of different electronic tools that facilitate the functions of information processing and communication, including transmission and display.

Thus, the boom in ICTs has been found to be linked to the economic sustainable development of a country. According to a study, based on data from 113 countries over 20 years, 1 per cent increase in the ICT resulted in the increase of 0.03 per cent in the GDP. For mobile networks, the relationship was more prominent with 1 per cent growth in mobile networks leading to an increase of 5 per cent in the per-capita GDP.

ICT in rural development: Communication is one of the major components and driving force of rural development. Conventionally, communication includes electronic media, human communication and now



information technology (IT). All forms of communications have dominated the development scene in which its persuasive role has been most dominant within the democratic political frame work of the country. Recent developments in Information and Communication Technology (ICT) have introduced a plethora of opportunities for development in every conceivable area. ICT as an enabler has broken all bounds of cost, distance and time and make the availability at finger tip. The fusion of computing and communications, especially through the internet has reduced the world indeed into global village creating new actors and new environments.

The introduction of communication in the educational process for open and distance learning is seen as step towards improving the quality of education and bridging the social and educational gap. The closing decade of twentieth century was the opening of historic information and communication technology interventions for development. This period has witnessed enormous and unprecedented changes in every aspect of communications technologies policies, infrastructure development and services. ICT can be used towards betterment of education, agriculture, social awareness and health and hygiene. The ICT boom in India has already started changing the lives of Indian masses.

ICT in agriculture: Information and communication have always been vital to farmers. They have sought information from each other regarding the most effective planting strategy, buying of improved seeds or feeds, the highest price being paid in the market. The answers to such questions are hard to come by for the farmers. Changing weather patterns and soil conditions, epidemics patterns of pests have created the problems for farmers' community. Updated information can help the farmers to not only cope with but also benefit from these changes, which led to increased productivity of food crops. Since it will bring new prices for consumers, contribute to smart agriculture and incentivize the farmers to increase their productivity. The search has been long on the effective solutions to address the long-term and short-term challenges in agriculture and to answer the vast number of questions which are faced by the farmers. ICTs have emerged as the potential solution to meet the aforementioned challenges. Due to their accessibility, affordability and adaptability, they have found their use even with the rural population. New small devices (such as multifunctional mobile phones and nanotechnology for food safety), infrastructure (such as mobile

telecommunication networks and cloud computing facilities) and especially applications (such as those that transfer money and track an item moving through a global supply chain) have proliferated. Many of the questions asked by farmers can now be answered easily and efficiently and with greater accuracy.

The number and type of ICTs which can develop the life of the farmers has been on the rise. Among them, the most noticeable and mentionable is the mobile phone which serves as a platform for exchanging information through the short messaging service (popularly known as SMS) and kisan helpline. Reuters market light, for example, services over 2, 00,000 rural subscribers in 10 different states in India for a cost of US \$1.50 per month. The farmers receive four to five messages per day on prices, commodities and advisory services from a database with information on 150 crops and more than 1000 markets. Several agricultural universities and Krishi Vigyan Kendra (KVK) actively engages themselves in such activities also. In recourse-constrained areas, satellites or remote sensors can be used to gather temperature data, internet can be used to store large amounts of data, and mobile phones can be used to disseminate temperature information to farmers cheaply.

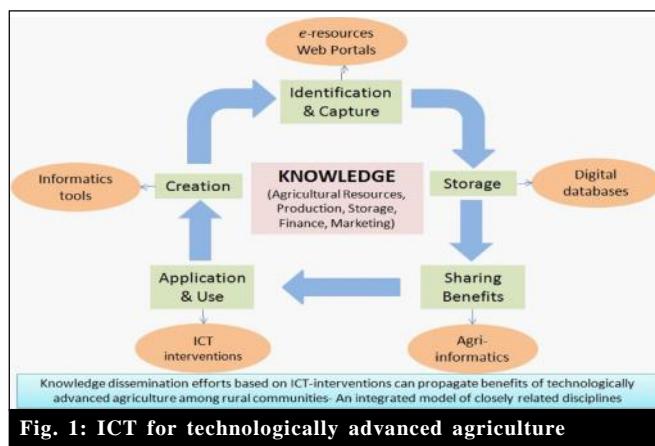


Fig. 1: ICT for technologically advanced agriculture

New initiatives of ICT in agriculture:

E-Choupal (<https://www.echoupal.com/>): E-Choupal is an initiative of ITC Limited, to link directly with rural farmers via the Internet for the improvement of agricultural and aquaculture product. E-Choupal tackles the challenges posed by Indian agriculture, characterized by fragmented farms, weak infrastructure and the involvement of intermediaries. The programme installs computers with Internet access in rural areas of India to offer farmers up-to-date marketing and agricultural information. Since the introduction of e-Choupal services,

farmers have seen a rise in their income levels because of a rise in yields, improvement in quality of output, and a fall in transaction costs. Even small farmers have gained from the initiative. Farmers can get real time information despite their physical distance from the mandis. The system saves procurement costs for ITC Limited. The farmers do not pay for the information and knowledge they get from e-Choupals; the principle is to inform, empower and compete. There is e-market place for spot transactions and support services to futures exchange.

National agricultural market (NAM): National agriculture market (NAM) is a pan-India electronic trading portal which networks the existing agricultural produce marketing committee (APMC) mandis to create a unified national market for agricultural commodities. The NAM portal provides a single window service for all APMC related information and services. This includes commodity arrivals and prices, buy and sell trade offers, provision to respond to trade offers, among other services. While material flows (agriculture produce) continue to happen through mandis, an online market reduces transaction costs and information asymmetry. As a part of National Agriculture Market (NAM), Prime Minister Narendra Modi launched the national e-agriculture market. These e-mandis (markets) will integrate the various vegetable markets across the country, bringing them all to one platform and registered farmers will now be able to sell their produce online in any of the markets where they can get the best price. NAM will initially aim at integrating 21 mandis in eight states on pilot basis Gujarat, Telangana, Rajasthan, Madhya Pradesh, Uttar Pradesh, Haryana, Jharkhand and Himachal Pradesh. The government has projected a target of integrating as many as 200 mandis in 2016, another 220 in 2017 and finally, reaching a total of 585 mandis by 2018.

mKisan (<http://mkisan.gov.in/>): As per TRAI data of May, 2014, though there are about 38 crores mobile telephone connections in rural areas, internet penetration in the countryside is still abysmally low (in single digit percentage). Therefore, mobile messaging is the most effective tool so far having pervasive outreach to nearly 8.93 crore farm families. mKisan SMS Portal for farmers enables all Central and State government organizations in agriculture and allied sectors to give information/services/advisories to farmers by SMS in their language, preference of agricultural practices and location. These messages are specific to farmers' specific needs and relevance at a particular point of time. SMS Portal for Farmers has empowered all Central and State Government

Organizations in Agriculture and Allied sectors (including State Agriculture Universities, Krishi Vigyan Kendras, Agromet Forecasts Units of India Meteorological Department, ICAR Institutes, Organization in Animal Husbandry, Dairying and Fisheries etc.) to give information /services/advisories to farmers by SMS in their language, preference of agricultural practices and locations.

e Governance and e education for rural development: Several states have initiated the creation of State Wide Area Networks (SWAN) to facilitate electronic access of the state and district administration services to the citizens in villages. The information and communication technologies (ICT) are being increasingly used by the governments to deliver its services at the locations convenient to the citizens. The rural ICT applications attempt to offer the services of central agencies (like district administration, cooperative union, and state and central government departments) to the citizens at their village door steps. These applications utilize the ICT in offering improved and affordable connectivity and processing solutions. Computerization of land records have been a great success in application of ICT in rural development. Land records are great importance to contemporary socio-economic imperatives and their revision and updation are necessary for capturing the changes in rural social dynamics. Land records are an important part of rural development.

E learning is the delivery of a learning, training or education programme by electronic means. E-learning involves the use of a computer or electronic device (e.g. a mobile phone) in some way to provide training, educational or learning material.

New initiatives in e governance and e education:

e-Kranti:

e-Kranti is an essential pillar of the Digital India initiative. Considering the critical need of e-Governance, mobile Governance and Good Governance in the country, the approach and key components of e-Kranti have been approved by the Union Cabinet with the vision of "Transforming e-Governance for Transforming Governance". All new and on-going e- Governance projects as well as the existing projects, which are being revamped, should now follow the key principles of e-Kranti namely

- Transformation and not translation
- Integrated services and not individual services
- Government process reengineering (GPR) to be mandatory in every MMP
- ICT infrastructure on demand

- Mobile first
- Fast tracking approval
- Mandating standards and protocol
- Language localization’, ‘National GIS (Geo-spatial information system)
- Security and electronic data preservation

There are 44 mission mode projects under e-Kranti, which are at various stages of implementation.

E-Pathshala (<http://epathshala.nic.in/>): E-Pathshala has been developed by NCERT for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials through website and mobile app. The platform addresses the dual challenge of reaching out to a diverse clientele and bridging the digital divide (geographical, socio-cultural and linguistic), offering comparable quality of e-contents and ensuring its free access at every time and every place. All the concerned stakeholders such as students, teachers, educators and parents can access e-books through multiple technology platforms *i.e.* mobile phones (android, iOS and windows platforms) and tablets (as e-pub) and on web through laptops and desktops (as flipbooks). Currently the e-contents are available in Hindi, English and Urdu.

NPTEL (<http://nptel.ac.in/>): The National Programme on Technology Enhanced Learning (NPTEL), a project funded by the Ministry of Human Resource Development (MHRD) provides e-learning through online Web and Video courses in Engineering, Sciences, Technology, Management and Humanities. This is a joint initiative by seven IITs and IISc Bangalore. NPTEL is a curriculum building exercise and is directed towards providing learning materials in science and engineering by adhering to the syllabi of All India Council for Technical Education and the slightly modified curricula of major affiliating Universities. It has developed curriculum based video courses and web-based e-courses targeting students and faculty of institutions offering UG engineering programmes.

Virtual labs (<http://vlab.co.in/>): These provide remote-access to Labs in various disciplines of Science and Engineering. These Virtual Labs would cater to students at the undergraduate level, post graduate level as well as to research scholars. These enthruse students to conduct experiments by arousing their curiosity. This would help them in learning basic and advanced concepts through remote experimentation *i.e.* provide a complete Learning Management System around the Virtual Labs where the students can avail the various tools for learning, including

additional web-resources, video-lectures, animated demonstrations and self evaluation.

Challenges of application of ICT in rural development: ICTs can't bring about rural development alone. Education is one of the basic problem for application of ICT as 40 per cent of India's population is illiterate. If the Indian economy grows at 5-6 per cent per annum as it has been growing over last 2-3 years, then over 10-15 years the size of the Indian economy would have doubled. Even with this level of growth it cannot by any means bridge disparities and eradicate poverty. Major power-cuts and 'brown-outs' is affecting the country-side ranging from 5 to 12 hours every day. Even though uninterrupted power supply systems are used; yet they prove insufficient to cope up with the power breakdowns. There is also serious band-width issues and connectivity problems. Even though technology is available to upgrade the band-width; not enough resources have been budgeted by the Government to change this scenario. However, once a few projects for the upgradation of the band-width on the anvil get commissioned, there should be a significant improvement in the connectivity. Drastic steps are urgently needed to inject funds for the development of the ICTs in the rural areas; increasingly by the participation of the private sector, Since there is acute shortage of project leaders and guides who could ensure implementation of the ICTs at the grass root levels. Unfortunately most professionals want to work in the urban areas where there are ample opportunities available to them for growth as well as prosperity. In the absence of these 'techno-catalytic' resources; development of ICTs in the rural areas will always be very slow. Proper training and implementation of ICT programmes in simple way and language is necessarily required which is also easily understandable by the rural people can surely bring about revolution in rural development.

Conclusion : ICT tools are helping in strengthening social networks as well as fostering productive processes at the local level through the provision of employment and skills, as well as support services for micro-enterprise activities. In rural communities of developing countries, with limited capacities and resources to respond to the effects of extreme natural hazards, drought, landslides, floods and to the impacts of these events on local social systems (e.g. health, infrastructure, transportation, migration), ICT tools (the potential of telecentres for disaster preparedness and response) are emerging as an area of increasing interest.