

Information Technology Services and Network Connectivity initiatives in rural India

Dr. Vaishali Sangvikar*

Dr. (Capt) C.M.Chitale **

Key Words:

Information Technology,
Rural India

Abstract: India's most prized resource in today's knowledge economy is its readily available technical work force. India has the second largest English-speaking scientific professionals in the world, second only to the U.S. It is estimated that India has over 4 million technical workers, over 1,832 educational institutions and polytechnics, which train more than 67,785 computer software professionals every year. Government of India is stepping up the number and quality of training facilities in the country to capitalize on this extraordinary human resource. It is the knowledge industry that will help take the Indian economy to a sustained higher rate of growth and the policy makers are fully aware of this. Government of India to foster financial inclusion, one cannot undermine the need to include the economically underprivileged in the mainstream banking sector

Introduction:

An Information and communication technology (ICT) has demonstrated opportunities to the people to utilize it in their socioeconomic and cultural development in a better and more sophisticated way. The idea that the Internet and related technologies might have an important role in aiding developmental efforts has captured a central place in international policy debates. Statements affirming the need to close the so-called 'digital divide' between social groups with and without access to the Internet have been made through several UN agencies, at the G-8 summit, and at meetings of developmental organizations around the world.¹

India's most prized resource in today's knowledge economy is its readily available technical work force. India has the second largest English-speaking scientific professionals in the world, second only to the U.S. It is estimated that India has over 4 million technical workers, over 1,832 educational institutions and polytechnics, which train more than 67,785 computer software professionals every year. Government of India is stepping up the number and quality of training facilities in the country to capitalize on this extraordinary human resource. It is the knowledge industry that will help take the Indian economy to a sustained higher rate of growth and the policy makers are fully aware of this. Government of India to foster financial inclusion, one cannot undermine the need to include the economically underprivileged in the mainstream banking sector. The role of various ICT tools and associated technologies in providing financial solution to the un-banked is also substantial. Information Technology provides

competitive intelligences by collecting and analyzing information about innovations, markets, competitors and environmental changes"

ministry of rural development, India has been a welfare state ever since her Independence and the primary objective of all governmental endeavors has been the welfare of its millions. Planning has been one of the pillars of Indian policy since independence and the country's strength is derived from the achievement of planning. The policies and program have been designed to alleviate rural poverty, one of the primary objectives of planned development in India. It was realised that a sustainable strategy of poverty alleviation had to be based on increasing the productive employment opportunities in the process of growth itself. Elimination of poverty, ignorance, disease and inequality of opportunities and providing a better and higher quality of life were the basic premises upon which all the plans and blueprints of development were built. "

In rural areas basic needs start with electricity, infrastructure including roads, water and sanitation systems, schools, healthcare centers, balanced nutrition, gender equity, employment and transportation facilities as well as telephony and network connectivity.

As far as social issues like religion, criticism, literacy rate, woman empowerment, all festival, social structure of village, political etc. are dimension of Indian growth and prosperity. India rural development implies both the improved quality of life in rural areas as well as greater social transformation. In order to provide rural people with better prospects for economic development, increased participation of people in the rural development programmed, decentralisation of planning, better enforcement of land reforms and greater access to credit are envisaged.

Telecommunication industry has provided tremendous opportunity for the development rural areas and it is possible to

* The author is Assistant Professor, MCA Department, Modern Engineering College, Shivaji Nagar, Pune

** The author is HOD, Department of management Science, Pune University.

reach them through available IT services to the masses. There are various telecommunication applications including Videoconferencing, Electronic Data Exchange, Electronic funds Transfer, Facsimiles, Telecommuting, Distance Learning, Telemetries and Electronic mail. The technology in turn influenced the society, development and social environment. Today the way people do the shopping, banking, booking of tickets, planning travels and so on in the developed world is entirely different from that exercises a couple of decades earlier. Today rural as well as urban people are used to telecommunication facilities and in the age of information revolution, and information technologies, these services are being used in almost all walks of life. WiMax is poised to deliver high speed wireless broadband at lower costs that will aide mass adoption and thus alleviate problems faced by India's broadband market, connecting all the 6,00,000 villages in a bid to reach out to rural people. It focused on the delivery of next generation broadband services using WiMax, based on the open standard IEEE 802.16.

The number of telephone subscribers in India increased to 70.63 crore at the end of August 2010 from 68.83 crore in July, thereby registering a growth rate of 2.61 per cent. With this, the overall tele-density in India has reached 59.63 per cent. Wireless subscriber base increased from 65.24 crore in July 2010 to 67.06 crore at the end of August 2010 registering a growth of 2.79 per cent. Wireless tele-density stands at 56.61 per cent. Total broadband subscriber base has increased from 0.97 crore in July to above one crore in August 2010. "5 Internet users in India approximately 40 million online of which 25 million are active weekly, of that 10 to 12 million on orkut. Internet access is dialup or choice of DSL and Cable but speed is slow. In India there are only 40 million landlines. Mobile users' ranges from about 180m to 240m, 185 of which 39.46 m are rural, thus approximately 20% of the user base in India is now rural. Penetration in major cites is approximately 50% while rural penetration ranges from 3% to over 20%."6

Mobile computing and commerce are spreading rapidly replacing or supplementing wired computing. Mostly wireless infrastructure like cellular mobile phone with text message, making voice call, Call registers, GPS Navigation, MP3 music, MP4 video, RDS radio receiver, alarms, Memo, PTT, USB, Bluetooth, Instant messaging, e-mail, document recording, personal organizer, personal digital assistant, Watch, Streaming video, Download video, Video calling, Build in camera, Camcorder, Internet access, Multimedia Messaging Service (MMS), Games, a calculator, Memory card reader, Wireless Fidelity (WiFi) connectivity, Wireless Application Protocol (WAP). Mobile devices create an opportunity to deliver new services to existing customers and to attract new ones Mobile computing with tremendous applications

Voice over Internet Protocol (VoIP), and Wireless-in-Local-Loop (WILL or WLL) technologies, however, now appear set to offer a cheaper and lighter form of telecom infrastructure, that should improve rural access exponentially. New software and dotcom start-ups have begun targeting non-English speaking users and the idea of non-elites using and benefiting from ICTs has began to gain currency.

Information Technology Services for rural and urban area to strengthen Indian Economy:

The idea of digitally-oriented development is as powerful and seductive as the technology upon which it is based. There is no single technological revolution has changed the lives of current generations in the way that the Internet has.

Television has had this kind of impact on the world's economy, its politics and its globalizing popular cultures, or even on our cultural conceptions of distance and time. The promise of digital development is that it might have the same reach as the original Internet boom of the mid 1990s only this time, the most underprivileged communities, those who had missed out on earlier waves of technology, might be able to 'leapfrog' over their more developed competitors. The greatest obstacles to rural development large distances and inadequate infrastructure might be obviated by instant access to virtual institutions that provide banking, education, health care, neonatal information, agricultural advice, and so forth. Financial Information and News services include Mutual funds, material for interactive investment and retirement planning and brokerage services. Several tool for facilitating online customer services like company provide set of answers to questions (FAQ), E-mail , tracking capability, personalised web pages, chat rooms, web-based call centers. E-commerce infrastructure requires a variety of hardware software and networks, Web Server, web tools. Electronic payments can be made by e-checks, e-credit cards, e-cash, and smart cards.

Information Technology and Rural Network Connectivity Reach

The rural India, government has provided kiosks to provide basic communication facilities like Internet connection, telecommunication services. Most of the regions are run kiosks like Andra Pradesh, Delhi, Gujrat, Karnataka, Kerala, Maharashtra, Madya Pradesh, Rajasthan Tamil Nadu and Uttar Pradesh.

The Village Knowledge Centers Project run by M.S. Swaminathan Research Foundation in Pondicherry represents an early experiment in providing information and knowledge resources to rural communities. The project uses wireless radios (CB radio) for data and analog voice transmissions between a semi-urban hub center and eight village centers. At each village center, offline content is updated through routine transmissions using fax protocols. Although the project displays outstanding sensitivity to context, as well as gender and social equity, and has conducted pioneering participatory experimentation and documentation, it has not developed a strong economic model to ensure the financial sustainability of the project. "7

The Gyandoot Project in Dhar, M.P., on the other hand, has emerged as a benchmark for innovation in the ecommerce and governance services it provides, as well as its business model. The project was initiated by members of the Indian Administrative Services (IAS) in consultation with various gram panchayat-s, which were selected as locations for village booths. Village panchayat-s paid for the equipment and space for kiosks called soochanalaya-s, which are operated by soochak-s, who were selected and trained from among the unemployed educated youth

of the village. The Gyandoot team has also worked hard on providing the back-office support that is required to make these services relevant and useful for rural citizen-consumers. Future scalability will rely on the installation of WLL based Internet connectivity, as well as new online educational content. "8

n-Logue has objective to provide training and technical support, Internet backbone connectivity, enable kiosk services through alliance partner and awareness program. n-Logue choose an enterprising local person from village itself to setup and run the kiosk. Kiosk is trained to use, and to help other people who are made by n-Logue. Typically woman, she has to any prior knowledge of computer. Kiosk had faced some technical problem like encounter virus, network connectivity problem and maintenance.

Requirement of Kiosk set up around \$1000, inclusive wall set to receive signals, pc with color monitor, Speaker, microphone, CD-ROM, digital camera, inject printer, and sound card, power backup, cabling & suite important s/w, browsing, email s/w all in the local language as well as English or prefer to other local language.

Local Service Provider (LSP) located in town not more than 15 to 20 km to each village. The proximity enables the LSP to reach a kiosk in about 60 to 90 min in case of an emergency. LSP Cover a 30 km radius, 3000 sq-km, 400-600 connections. LSP is made a 50% in the total business by n-logue, LSP is also assigned the task of identifying an appropriate entrepreneur in the village and required to help them.

n-logue decided to adopt the demand aggregation approach to small villages by creating an Internet kiosk with a computer, an Internet connection, printer and some accessories like web camera in each village. Rural connectivity providing communication services (e-mail, chat, browsing) as well as much needed application like education, training, healthcare, agriculture consultancy & e-government. Services like Communication, Education, Computer Education, Spoken English, Typing, Photography, Agriculture consultancy & Veterinary and videoconferencing.

Some problem for sustain kiosk like technology is cost effective, should be affordable, scalable. Organization structure depends on cultural and geographical environment are more focused on rural market. Business model (Cor-DECT) is more visible to all related variable to uplift the rural market.

n-logue Communications incubated out of the TeNet group at IIT-Madras is now providing connectivity for a series of new projects across India, including those in Madurai and Nellikuppam, T.N., and Sikar, Rajasthan. The company works on a commercial basis in partnership with various local partners, including entrepreneurs and non-governmental organizations. "9

The Management of Pravara Group liked ten different institutions in humanites. Health, engineering, agriculture, pharmacy, polytechnic, and rural development. The Internet connectivity and access was provided by the National Informatics center satellite based V-SAT (Very Small aperture Terminal). There are ten villages are connected to Internet where the agricultural

extension services are being rendered by Krishi Vigyan Kendra (KVK), provided various services for farmer in the Pravara region, services like: 1) Technical Information, KVK home page provide the linked to pages containing information on latest news, events and standards or order or policies on various technical issues related to improved farming practices. 2) Market Information, KVK provides useful links for latest commodity arrivals, highest and lowest prices particularly cereals, crops etc. in different markets of the state, country and world. 3) Weather Service, KVK providing statewide or district level rainfall and temperature forecast Geographical Information System (GIS) pictures of the country that are updated on daily basis. 4) E-mail and Voice-mail, the advisory service renders the information asked by the farmers through electronic mail or through audio messaging service through voice mail. 5) FAQ, provides information on the problems and solution on general crop grown in the region like Sugarcane, Wheat, Pulses, Cotton, Grapes etc. 6) Information regarding the event like national and international exhibition, seminar, conferences and fairs. 7) Crop information in regional language, section wise information on fruits, vegetables and flowers. 8) Linkage to other agricultural institution for research and extension. 9) Update Information regarding State and Central Government Policies and Schemes. 10) Information regarding appropriate training schedule. "10

TARAhaat.Com promoted by Delhi-based Development Alternatives, is an extremely ambitious commercial project to provide online services to a large number of rural communities in north India. One of the more innovative aspects of this project is its highly interactive and graphics-intensive interface system, which allows semi-literate and neo-literate users enhanced access to products and services. The organization had initiated information centers in several locations in Bundelkhand, M.P., and Bhatinda, Punjab, of which the later are still functioning. While the project will provide a menu of services that is similar, in many ways, to other rural ICT projects, its current business model requires an astonishing influx of capital before it becomes self-sufficient. "11

The NIIT 'Hole-in-the-wall' initiatives consist of unattended point-and-click devices in urban slums. In early 1999, Sugata Mitra set up an unmanned computer with a track ball in a slum adjoining the New Delhi offices of NIIT Limited, the major software development and Research Company. Continuous video tape monitoring of the computer showed that young boys and girls from the settlement became highly proficient at using the graphic interface, and in surfing parts of the web, notwithstanding limitations of language and training. The social and economic returns of setting up such unattended systems are yet to be fully comprehended. "12

Most of the project initiatives represent diverse approaches to plan how to run successful. First, economically responsible projects are already proving more successful than charitable or free models. Second, projects that identify and cost the services they provide are also more successful. Third, an intimate understanding of the social and economic parameters of rural India gives connectivity providers a significant advantage. Fourth, WLL systems appear to

be emerging as the infrastructure solution of choice.

E-Governance, Currently these applications run by The State Wide Area Networks (SWAN) and Rural Development Applications (RDA).¹³

The Gyandoot Project in Dhar, M.P., has developed a very important e-governance protocol, in the form of the shikayat, or complaint. For a fee of Rs. 10, rural citizens may select from a predetermined menu of 30 different kinds of complaints, which together cover a wide range of citizen-consumer to government interactions in rural areas. These include for example: the absence of a school teacher; the death of a head of cattle that may require a government veterinarian; the malfunction of a public hand-pump that must be repaired, and so forth. Although this project has established only about 30 village centers so far, the number of complaints and requests that come pouring in every day has put enormous pressure on the office of the zila panchayat to redesign and to wire up its own back office systems, so as to keep pace with this demand. The lesson here is that E-Governance will be pulled into existence and operation through citizen-consumer demand.¹⁴

In Andhra Pradesh, Rural Development Department connectivity over APSWAN Connectivity to Police Department across APRajIV Project, APSWAN, a State-wide network for voice, data and video communication, is the basic information highway for improving government-citizen and government-industry interface. In subsequent phases, APSWAN would be extended to all 'mandal' headquarters, other towns and eventually to all villages. APSWAN makes use of the 2MB dedicated communication network established by AP Telecom from the State Headquarters to all the Districts and the other two important centers viz. Vijayawada and Tirupati. The Andhra Pradesh government is responsible for some early initiatives that sought to use networked technologies to improve citizen services. A series of acronymed services including CARD, TWINS, FAST, etc. provide licenses and certificates, allow the registration of deeds, and various kinds of payments at a single counter, in certain urban and rural areas of the state.¹⁵

In India Reserve Bank of India (RBI) is working at tandem to operational banking services at the remotest corner of the country with the help of small hand held device or mobile phones. The technologies like smartcard, virtual credit card and mobile phone provide expedient banking services at affordable cost. Mobile payments system or m-commerce is the ability to buy and sell goods and services through wireless handheld devices like mobile phone, PDAs etc. m-commerce is based on the Wireless Application Protocol (WAP) technology or Near Field Communication (NFC). NFC is short-range wireless technology that evolved from a combination of existing contact-less identification and interconnection technologies. Smartcard is a pocket size card with an integrated circuit to process information. Smart-card stores data which can be wither in the form of value or information or both. It has several key applications like healthcare, banking, entertainment, transportation, telecommunication, secure identification etc. State Government of Andhra Pradesh (GoAP) has work on routing social security payment to windows,

handicapped, old and eligible weavers through the use of smart card and business correspondents.

'Bhoomi' is a major Government of Karnataka initiative to computerize land records across the state. Kiosks managed by an operator to assist the citizens in rural areas for accessing the services of the government. Rural Digital Services (RDS) to offer value added services, including video conference, to citizens across the state by charging minimal costs. Karnataka State Wide Area Network (KSWAN) will provide 2 mbps connectivity from Bangalore to all district headquarters of the state (27 locations) and 64 kbps connectivity to taluka headquarters. BSNL will set up a wide area network (WAN) for the Karnataka government at an estimated cost of Rs 170-crore.¹⁶

The computerization of these land records is an expensive, laborious and time-intensive process, as the online system must (i) aggregate several different types of traditional village record-keeping, and (ii) provide a real-time record of landholdings, so that they may have unimpeachable legal standing.

Wired Micro-credit, Microfinance, Micro e-commerce, there is no doubt that the computerization of microfinance and micro-credit records could result in savings of time and effort, and generally facilitate the maintenance of these accounts. However, the real transformative effect of this technology will be seen only once micro-credit accounts come to be used for online or distance transactions amongst or within village communities at the grass-roots. This will allow rural entrepreneurs and craftsperson's the same savings of time, travel, and effort, that the Internet has afforded individuals and institutions in the industrialized world. These possibilities have not yet been charted in any rural ICT project.¹⁷

The Swayam Krishi Sangam project is recording transactional information on optical ID cards for microfinance, as well as for education and healthcare. Dr. Mohammed Yunus, Founder of the Grameen Bank of Bangladesh has notably called for the establishment of an 'International Center for Information Technology for the Elimination of Global Poverty'. A related agency, Grameen Telecom has attempted to provide mobile telephones to rural consumers through existing MFI / MCI networks.

eSagu, an IT based agricultural extension system prototypes for 1051 cotton farms has been developed at International Institute of Information Technology, Gachibowli, Hyderabad with the support from Ministry of Communication and Information Technology New Delhi. The team of agricultural experts has stayed at Hyderabad and delivered agricultural experts advice to 1051 cotton farms of three villages belong to Warangal districts during 2004, in first village a small computer center have been developed with two computers, one laser printer and digital camera as a infrastructure. Fourteen educated farmers were selected as a coordinator; five agricultural scientists were employed in the projects. 80-100 farms were assigned to each coordinator; he will visit 20 farms per day and he also fills in pest observation forms and takes its photographs. The programmer at the village computer center downloads these photographs for the digital camera to computer and writes into a CD. The CD is brought

to III Hyderabad by person, the photographs are uploaded to the main server and the agricultural expert's advice is downloaded by programmer through the Internet. A printout was taken to the corresponding coordinator. The coordinator contacts the farmer and explains the advice. Based on the this observation an effort was made to develop a cost –effective and scalable eSagu by delivering personalized advice to 5,000 farmers and six crops (Rice, Cotton, Chillies, Castor, Red gram and Groundnut) by using notation of farm-clusters. The basic idea is that several farms of that crop can be grouped into one cluster to minimize the similar problem of common crop.”¹⁸

IT-enabled Industries, facilitating the flow of capital across rural areas, online financial and commercial systems could also provide the capital and infrastructure for new kinds of IT-enabled industries, in fields such as regional language data entry, Computer-Aided Design (CAD), and Computer-Aided Manufacture (CAM). These applications of information technology, of course, will only become possible on a large-scale once rural ICT projects are better established in the landscape. The Asian Center for Entrepreneurial Initiatives (AsCent;) has made an early attempt to introduce CAD / CAM technologies to artisans in north Karnataka, alongside online advertising and sales.

Computer Training and IT-Enabled Education:

Computer-training and IT-enabled education has been distressingly conflated and confused in the understanding of administrators and policy makers as well as the general public. Most commercial providers, moreover, are involved in both sectors and aggressively cross-market themselves.

Pratham, Akshara and The e-Learning Center together represent the most important attempt to create IT-enabled learning software for privileged children. They have developed educational games, which are now being tested in several rural areas through the Center for Knowledge Societies, Bangalore. In Karnataka, 1000 rural schools are to be computerized by private operators, including NIIT. “¹⁹ School Net India the educational infrastructure wing of Infrastructure Leasing and Financial Services (IL&FS), is building multilingual educational content online, as well as CD-ROMs for use by teachers as a supplement to classroom education.

e-Gurucool, and Zee Interactive Learning Systems represent commercial attempts to provide online educational resources coupled with products ranging from in-class instruction to interactive CD-ROMs, to cable-TV programs. These products are predominately in English, although regional language translations could become widely available in future.

Tele-Health:

Computer-based and online expert diagnostic systems could enhance the quality of healthcare and diagnosis available to rural citizen-consumers in many remote parts of South Asia. The real benefits of these systems, however, may be the collation of more comprehensive public health information. In addition to tracking the case study of an individual patient, therefore, such systems

could also collect data on the public health in a region, for further epidemiological study. The George Foundation has experimented with an expert diagnostic program on a free standing PC in Dharmapuri district of Tamil Nadu. Other initiatives by privately run hospitals are in the planning stages.

Rural information networks can allow knowledge, services, money, and certain kinds of products to more easily flow from node to node across long distances. Each village node can also serve as a range of virtual institutions, such as a community center, a bank, a medical center, a government information center, a matrimonial office, a public telephone booth, a public library and educational resource center, all at a fraction of the cost of corresponding 'real' institutions. By making these resources available in villages, information centers can alleviate the asymmetry between urban and rural environments. In order to accelerate rural growth, it is essential that we learn new ways of integrating social and human infrastructure development into the installation of basic information and communications infrastructure.

In Dec 2001, Vigyan ashram collaborated with M/S n-Logue communications Pvt. Ltd. N-logue has an ISP license and providing Internet connectivity using Wireless in local loop (Cor-Dect) technology. Two access centers one in Pabal (Shirur Taluka) and one in Rajgurunagar in Pune District. We have 45 meter tower at both the places and 21metertr tower at three places for five repeaters RBS where Line of Sight is not clear due to hills.”²⁰ Typically these kiosks were run by an entrepreneur, who provides various services to the villagers. Villager pays money for the services. Each kiosk was having a multimedia PC, Printer, web camera, wall set for Internet connectivity. After 5 years of operation many of the Kiosks could not sustain their operation due to insufficient revenue.

Indian Software Industry and future scope for rural development:

India has the largest number of youth who are the major strength and the future of the IT industry. The country, with such a young force, has a huge possibility of growth. Almost two-third of India's youth live in rural areas. Thus, it is necessary to reach out to them and make them IT literate and build the capacities for rural employability.

Increasing access to technology can be a critical driver of economic growth in rural India, but it will require government and industry leaders to work together to make it happen. Inclusive IT development requires a business model linking rural skill development with commercial outsourcing. Rural IT is making a positive contribution to improve the access to competitive employment for the young and educated population of rural India.

Revolutions in the Information and Communications Technologies (ICT) have the potential to remove the barriers to information asymmetries that were impeding the working of markets that are critical for economic growth. The forces of globalization have created opportunities for the integration of rural populations in a larger marketplace than was ever available to them before. Particularly when the industry is expected to grow five fold over

the next five years to clock revenues up to USD 28-30 billion by 2012, if they receive the required fillip. By 2020, if one-tenth of domestic Business Process Outsource (BPO) is outsourced to villages, it will employ 900,000. ²¹ This would also help bridge the urban rural divide. Also, leveraging economies of scale and a modest increase in price will boost margins for domestic BPOs. The establishment of BPOs in villages is resulting in the development of rural infrastructure, increase in standard of living, and generation of sufficient employment opportunities at the village level. All this is effectively addressing the problem distress migration.

Mass deployment of information kiosks is critical for effective use of the Internet based content and services. Information kiosks are economical feasible, should be designed to become electronic supermarkets, being information sources, handle other services of use to the people living in rural area. The revenue available through such sources can make a kiosk attractive for prospective investors.

Problems faced by Rural People:

Electricity, in many rural areas, electrical supply may be restricted to only 6 or 8 hours a day. When electrical power is available, its voltage and frequency may vary far outside the acceptable limits of most hardware. Finally, there is often no earthing provided.

The Solar Electric Light Company, SELCO has achieved international recognition as the first company to concentrate on marketing and servicing Self Help Service (SHS) in the rural Indian market. Under the direction of Managing Director H. Harish Hande, SELCO had installed over 500 SHS by early 1997. To overcome the electricity cutoff, solar electricity option to a larger segment of Indian Population. SELCO has set up financing programs through several rural banking institutions, including Syndicate Bank. SELCO is also financing SHS through low-cost World Bank funds available through the PV Lending Program of the Indian Renewable Energy Development Agency (IREDA). Through the IREDA funds, SELCO has been able to provide SHS financing to members of several farmer societies and cooperatives in South and Central Karnataka. SELCO is the first organization to use World Bank funds to provide SHS financing for rural customers.²²

Rural ICT projects, battery back-ups and Universal Power Supply-s (UPS-s) are mandatory. In addition to these battery systems, circuit breakers and voltage stabilizers are also necessary. Several agencies have had to create their own earthing pits outside their village centers, by digging shallow trenches, filling them with salt, and making sure they are watered on dry sunny days. Constant maintenance of this privately constructed earthing pit is necessary to ensure that the equipment within is protected from power surges.

The most common problems in implementing e-government projects are the poor connectivity in rural areas due to lack of telecom network, frequent power failures, insufficient funds to equip the kiosks with the latest infrastructure and difficulty of illiterate people to cope with the new technology. We collected data regarding the solutions adopted by them to overcome the

hurdles, based on our contacting and interviewing the various e-government agencies and also through literature search on these projects. The problems are under three parameter which are Operational, dial up connectivity, awareness of rural broadband connectivity, WLL technology enables continuous access, to create needed information, integrated information systems across geographical location or subsystems, adding modern hardware and software with user friendly system to rural people, language barriers, Economic, lack of funding , encouraging public-private partnership, development of kiosk, and personal, acceptance of new technology in mass group, conducive environment, unskilled training. ²³

Research, Advocacy and Consultancy Resources:

Non-profit industry groups such as India's National Association of Software and Service Companies have served as advocates against policy regulations that might inhibit the growth of bandwidth and connectivity in South Asia. The website hosts important statistics and information in the on India's Internet economy. The NGO Voices serves as a research and capacity-building resource for community radio, and is beginning to experiment with the interface between Internet and radio. Mahiti.Org, a branch of the NGO Samuha provides IT-services for NGOs in Bangalore area. The Center for Knowledge Societies, Bangalore has collected socio-economic data on many of the projects mentioned above, and is also providing research and consultancy services for some of the developmental organizations and enterprises mentioned above. ²⁴

Potential Impact on Rural Economies and Societies:

ICTs have been largely understood as a new kind of media or telecommunications infrastructure, which allows the dissemination of information, commands, or even education across distances. Developmental ICT projects, therefore, have attempted to assist rural communities by providing them news, information, advice, and knowledge which has hitherto been inaccessible to them. These kinds of inputs have allowed rural citizen-consumers to make more informed economic decisions: farmers can decide whether to sell their produce locally or transport it themselves further a field; landless laborers have been able to negotiate their daily wage more effectively; tractors, threshers, old television sets, cattle and motorcycles have all been traded across towns and villages thanks to online advertisements.

However, rural ICT projects are yet to effectively position themselves as a vehicle for online commerce and a mechanism of employment for village communities. The first step in this direction would be to put rural Self-Help Groups (SHGs), largest microfinance in the world. The objective of technological solution which aims at strengthening the financial service delivery allowing 'financial independence' of SHGs would be a long way help in developing self sustaining communities. Internet café's (small or medium sized enterprises with commercial goals and tele-centers (NGO), shows how smooth the transition between may turn out to be and how much they can complements each other. Micro-Credit / Micro-Finance Initiatives (MCIs and MFIs) online, abstraction of cash money onto an online financial system would lay the

groundwork for a new kind of rural e-commerce, which could prove extremely enabling for many communities. Entrepreneurs and small-scale industries might then be able to regularize existing off-line trade relationships into online systems that track raw materials, designs, quality control, and delivery mechanisms. New kinds of banking and finance systems in rural areas would make capital more easily available for investment into new businesses and rural infrastructure.

While persons making less than a dollar a day might immediately benefit only by having access to a more efficient and easily accessible form of banking, in the long run unemployed and underemployed poor would experience the significant secondary benefits of actually having access to a far better developed economy and the range of education, employment, and self-empowerment opportunities available therein.

Literacy and Education, education standards are rising but youth can not stay in village, every educated person want to give good quality of study and standard life as compare to us to their children that why they prefer to struggle in urban city. The necessity of awareness is required to guide them to choose correct path of life.

Social structure of village based on religions, acceptance of other religions, more focus on 'growth of our village' this mindset is very important, major role of local politician and government scheme match there objective of village. The good environment with all necessary resources, business opportunity, learning center are depends on growth of village.

Funding organizations and policy makers can encourage innovations in Information Design by stipulating that their projects routinely undergo socioeconomic impact analyses by specialist external agencies that have demonstrated their understanding of rural socioeconomic relations, and the potential impact that ICTs may have upon them.

Conclusions:

With the help of above initiatives taken by government, industry and NGOs we can conclude that the new technologies are helping in bridging information technological divides. There is increased participation in this revolution from rural parts of India. There are a number of ways through which ICT is enhancing rural productivity. ICT enables solution sharing between local people and communities, providing access to practical information on small business, weather trends and farming best practices, e-governance and other value added services. Increasing use and pervasive impact of ICT can substantially enhance the ability of rural areas to address the full range of development goals. In rural parts of India there are various information technology services available like telecommunication services, mobile services, internet service along with value added services. The percentage of people enjoying these services at rural part of district is not satisfactory .There are many problems related to connectivity at rural places. The presence of various information technology services in the rural parts is at primary stage..There is a greater need of various kinds of information technology services like internet technology, communication facilities and trained I.T. human resource at rural places. The value added services of

information technology like e-farming, e-governance, E-education etc. can provide basis for development. The upcoming network technologies can fulfill the requirement of rural areas in the development of rural connectivity in its benefit.

References:

- Aditya Dev Sood , "How to wire Rural India?", A Survey of the Problems and Possibilities of Digital Development .
<http://www.indiatogether.org/reports/WireRuralIndia.htm>
- Efraim Turban , R. Kelly Rainer, Richard E. Potter, "Introduction to Information Technology", 2nd Edition, Wiley India , New Delhi, pg. 427.
- Dr. C. P. Joshi , Minister of Rural Development (Govt. of India),
<http://rural.nic.in/i1.htm>
- Ritu Singh , "WiMax to make a huge impact on Indian broadband markets", Voice and Data Magazine , Thursday, October 14, 2010.
- Bureau, "Telephone user base crosses 27-cr mark", The Hindu Business Line, Wednesday, October 06,2010,
<http://www.thehindubusinessline.com/2010/10/06/stories/2010100652300700.htm>.
- www.ge.com/in.
- M.S. Swaminathan Research Foundation's Information Village Research Project (Ivrp), Union Territory Of Pondicherry [Www.Mssrf.Org](http://www.Mssrf.Org).
- Gyandoot A Community-Owned, Self Sustainable And Low Cost Rural Intranet Project, [Www.Gyandoot.Net](http://www.Gyandoot.Net)
- Ashok Jhunjhunwala, Anuradha Ramachandran, Alankar Bandyopadhyay, "n-Logue: The Story of a Rural Service Provider in India", The Journal of Community Informatics, (2004), Vol. 1, Issue 1, pp. 30-38, www.n-logue.com.
- S.B. Verma, "Information Technology and Management", Deep and Deep Publication Pvt.Ltd. , New Delhi, ISBN 81-7629-563-9, page no.208,209.
- Joseph Zajda, Donna Gibbs, "Comparative Information Technology: Languages, Societies and the Internet", www.tarahaat.com.
- Sugata Mitra, Ritu Dangwal and Leher Thadani, "Effects of remoteness on the quality of education: A case study from North Indian schools", ustralasian Journal of Educational Technology, 2008, 24(2), 168-180,
<http://www.ascilite.org.au/ajet/ajet24/mitra.html>.
- Prof. T.P. Rama Rao, ICT and e-Governance for Rural Development Center for Electronic Governance, Indian Institute of Management, Ahmedabad,
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.136.5211&rep=rep1&type=pdf>.
- R.V. Rajan, "HOW TECHNOLOGY HAS CHANGED THE NATURE OF RURAL MARKETING", An article which appeared in Marketing White Book, November 2007 Issue, 1 - Nov - 2008
<http://www.anugrahmadison.com/press/press61.html>.
- Prof. Vikram Singh, "Impact of Information and Communication Technology on Public Life", page no. 62, University Science Press.
- Rajeev Chawla, and Subhash Bhatnagar, "Bhoomi Online Delivery of Land Titles in Karnataka, India", The World Bank, Date submitted on December 20, 2001.
- Mr. Talluru Sreenivas , "Globalization and emerging India", page no. 252, Discover Publishing House, ISBN 81-8356-055-5.
- Mr. V.K. JAIN, "INFORMATION TECHNOLOGY Issues and Challenges", First Edition, Excel Book, Page no. 59, ISBN 978-81-7446-706-5. ICT@Schools,
<http://www.niit.com/SERVICES/SOLUTIONSFORGOVERNMENT/ITEDUCATIONFORSCHOOLS/Pages/ComputerEducationAtSchools.aspx>.
- Wireless Local Loop,



<http://www.vigyanashram.com/html/services.htm>.

Jerry Rao, BPOs The Call Of Rural India, NASSCOM Foundation,
<http://ngopost.org/story/bpos-call-rural-india>

Solar electric Light Fund, powering a brighter 21st century projects,
Andhra Pradesh, India, <http://www.self.org/india.asp>

Narasimhaiah Gorla, "Hurdles in rural e-government projects in India :
lessons for developing countries", Electronic Government, An International
Journal, Vol. 5, No. 1, 2008 91.

Information Technology

Ian Pringle and M.J.R. David , "Rural community ICT Applications: The
Kothmale Model",

<http://www.ejisd.org/ojs2/index.php/ejisd/article/viewFile/43/43>

Nandan Nilekani, "Imagining India", Ideas for the New Century, ISBN No.
9780143067078, New Delhi, Page No. 269.