

## Role of Science & Technology in Making Rural India Shine: An Overview

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**ABSTRACT:** India envisions its position to be among top five global scientific powers by 2020. It has declared 2010-2020 as the Decade of Innovation. One of the primary focuses of Science and Technology Policy 2013 is to invest in young innovators and entrepreneurs through education, training and monitoring. As in the case of developed countries Science & Technology can play a major role in bringing about social and economic transformation in our country, especially in the rural areas. This paper examines some important aspects of Science and technology which will help in making rural India shine. This paper explains the Application of Science and Technology in Rural Areas (ASTRA). The research paper focuses on six considerable conceptual and practical issues. Firstly, it conceptualizes rural development and tries to present a more corporeal definition of rural development as “it is utilization, protection and enhancement of the natural, physical and human resources needed to make long-term improvements in rural living conditions. It involves provision of jobs and income opportunities while maintaining and protecting the environment of rural areas”. Secondly, it presents the importance of Science and Technology in the present era of information. Thirdly, an appropriate area for application of Science and Technology are discussed and how it can play crucial role in building up local capacity, devising solutions for tackling the identified problems, and improving the lives of rural people by improving their backdrop and daily activities of rural India. Fourthly, ten areas namely agriculture, energy, water, housing, biotechnology, information technology, space technology, technology transfer, women empowerment, education and employment are presented in which the application of science and technology could help in ‘shining’ the real ‘Bharat’. Fifthly, this paper throws some light on the programs of (DWCRA) Development of Women and children in Rural Area. At lastly the paper gives some suggestion on how close linkage between the Central and State S&T agencies for demonstration, distribution of information, transfer of technology etc. can give the desired results. The paper concludes with the thought that the key role in rural development would be of the scientists, and ‘challenge before the scientific community today’ is to accept and fulfill this task. Much concentration is needed in order to formulate rural India ‘shine’ because India cannot ‘shine’ without the ‘shining’ of rural India.

**Keywords:** Decade of innovation; optimum; rural area; ASTRA; DWCRA

### INTRODUCTION

In general, a rural area or countryside is a geographic area that is located outside towns & cities. Administration of the US department of health and human services, defines the word rural as encompassing “all population, housing and territory not included within an urban area. Whatever is not urban is called rural. It has low population density, agricultural area are commonly rural. Rural areas are characterized by farms, Vegetations and open space. Science and technology which will help in making rural India shine. In rural areas so many scheme launched by the central govt. and state govt. which leads to improve the status of the rural peoples. So many community groups and other groups working with govt and NGOs for development of the untouched society of the country. There are so many schemes include scientific cultivation, income generating activities. Use of computer and awareness with banking policies etc. As below there are discussed six considerable conceptual and practical issues which are using in the development of rural areas discussed as one by one.

**Conceptualizing Rural Development:** The notion of rural development has been conceived in diverse

ways by researchers, ranging from thinking of it as a set of goals and programmes to a well-knit strategy, approach or even an ideology. If we read through the relevant literature, we will realize that its scope and content are vague and do not have well-accepted analytical boundaries. As has often been noted, however, this may be viewed both as a weakness as well as strength. A weakness because, apart from the issue of conceptual clarity, it also means, that the very operation of this idea is in a grey zone. Whatever be the differences in conceptualizing the notion of rural development, there is a widely shared view that its essence should be poverty alleviation and distributive justice.

Rural development became a planning concern as it became clear that the strategies adopted in developing countries remained largely ineffective in alleviating poverty and inequalities in rural areas. It became increasingly clear that apart from an effort to increase agricultural and industrial production, it was also necessary to address directly the problems of education, health services and employment and to attack the problem of poverty in rural area. The increasing interest in rural development is a result of the realization

that a systematic effort is necessary to create better living conditions in the rural areas where the vast majority of populations of developing countries reside.

Now firstly we would define rural development as “it is utilization, protection and enhancement of the natural, physical and human resources needed to make long-term improvements in rural living conditions. It involves provision of jobs and income opportunities while maintaining and protecting the environment of rural areas”. Following are the primary objectives of rural development.

- (a) To improve the living standards by providing food, shelter, clothing, employment and education;
- (b) To increase productivity in rural areas and reduce poverty;
- (c) To involve people in planning and development through their participation in decision making and through decentralization of administration;
- (d) To ensure distributive justice and equalization of opportunities in the society.

**Importance of Science and Technology:** The Scientific Policy Resolution adopted by the Government of India late in March 1958, had emphasized the powerful role of science and technology in the development of the country as indicated below:

In the last decades there has been a major effort to implement the spirit of the Scientific Policy Resolution (SPR). However, due to various reasons, and particularly the large and continuing increase in population it has not been possible to truly bring about an impact of scientific advances on the life of the people to the extent expected, but the desire to do so has been there throughout.

It is recognized worldwide that science and technology are among the most powerful motive forces to bring about dynamic changes in the society; and that appropriate and wise application of science and technology to all facets related to human welfare can bring about desired social and economic transformation. It is clear that developing countries will have to increasingly depend on science and technology for their progress; but the use and application of science and technology would have to be carefully planned.

Today, events taking place in any corner of the planet become known the world over almost in no time. More and more economic decisions and operations have global ramifications. The increasingly greater integration and centrality of technology, information and communication into the functioning of economy and society is taking place so rapidly and on such a vast scale that globalization and emergence of information societies is becoming a reality.

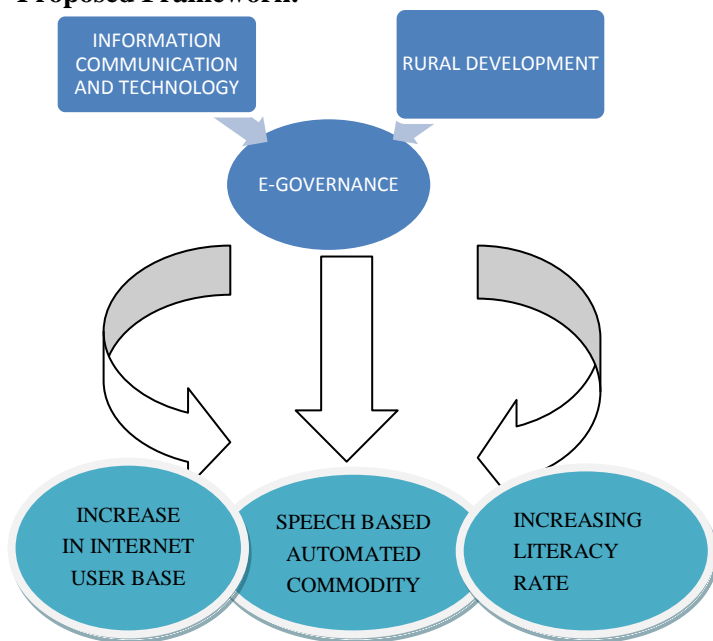
However, all nations and groups and individuals within a nation cannot uniformly or equitably share the benefits of information technologies. Hence, the fierce debates about the hopes of a utopia and the despair caused by the widening digital divide and the promises of a prosperous peaceful world and fears of cultural clashes.

What implications do these developments have for rural societies and the economy and life in rural India? We had overviewed the issue in the light of experiences with innovative uses of science, communication and information technologies in the context of rural communities. Experimental applications of science and technology (S&T) in many parts of India have shown good results promising that S&T would serve as facilitators of rural development and empowerment of the weaker sections of the rural society.

There are various e-governance projects in rural India listed below:

- E-CHOUPAL
- GYANDOOT
- JAGRITI E-SEVA
- AKASHGANGA
- KISAN CALL CENTRES
- TATA KISAN KENDRA (TKK)

**Proposed Framework:**



**SOURCE:** Ambika bhatiya, chavvi kiran 2016 rural development through E-Governance Initiatives in India pp61-69

**Appropriate Application of Science and Technology:** In a country of India’s size and diversity, where more than 70% of the population resides in the rural areas, inputs of science and, technology in agriculture, irrigation, water management, education, health,

energy, industry, transport, communications, employment generation, housing, etc. are crucial. The size of the land holdings is very small and becoming smaller with increase in population; technological inputs are therefore, essential, to increase productivity and economic viability.

We also require a major attitudinal change; rural development does not mean only use of simple and what many regard as appropriate technologies which may be obsolete and inappropriate. In fact, the word “appropriate;” should, be looked at in the larger context i.e. what is it that would be most appropriate for the rural areas to fulfill their basic needs and to improve the quality of life of the people taking note of the available skills, financial and natural resources. Some of the technologies appropriate in this context may involve advanced concepts and use very recent scientific developments. Identification of the problems with the help of the concerned people, a proper feedback mechanism and a constant interaction between the, scientists and the rural population is called for to define and apply technologies that are indeed appropriate. Some of the upstream areas of science and high technology like Space, Biotechnology, Information and Communication Technology (ICT) and Electronics can be of great relevance for rural development when conceived in the context of problems encountered.

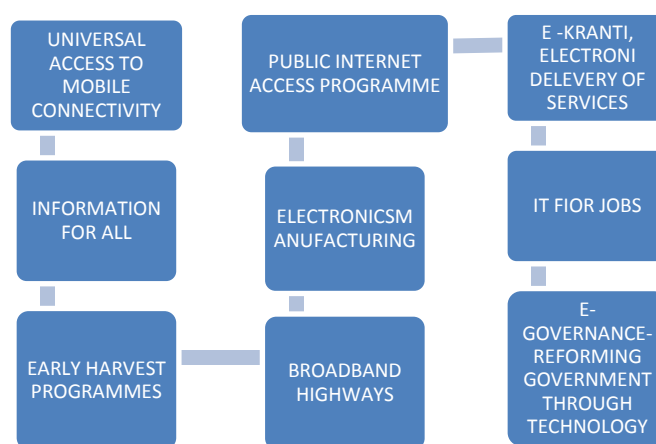
Keeping in mind this prime need for development and application of science in the country, under his dynamic leadership, and through his vision, the country has witnessed spectacular advances in many fields of science.

We want to discuss here, the DIGITAL INDIA CAMPAIGN’ the most efficient way for communicating with all the people of the world’s largest democracy is through connectivity at digital platform. Government of India has aimed at effectively using the improvement in ICT to reduce the digital divide in the country. Digital India is centered on three vision area listed below :

1. Digital infrastructure as a utility to every citizen
2. Governance and service on demand
3. Digital empowerment of citizen

**Pillars of Digital India Campaign:** Science and Technology have the capacity to significantly empower people and facilitate development. This major technological revolution can significantly influence the development capacity of any society. Their applications to agriculture and rural development are very extensive and pervasive. With telecommunication technology, computers and information processing technology, data and image transfer technology, and inter-

active technology, S&T have made a qualitative difference in the way we can generate, disseminate and transfer knowledge and promote development. The convergence of these technologies has created not only a new technological and production sector, but also a new social and economic reality in the rural sector. Increased connectivity and quicker flow of information has opened new frontiers of knowledge.



SOURCE: DELOITTE REPORT

Science and Technology can develop in rural communities a learning and innovation capacity that increases the effectiveness of their efforts to solve problems and improve their lives. However, technological applications are largely restricted to urban areas. Rural areas have not reaped enough benefits from them.

Science and Technology must be used judiciously as important tools in developmental activities to address the problems of rural development in all sectors of the economy, such as, agriculture, energy, health and sanitation, rural engineering, housing and habitat, etc. It is, therefore, necessary, to develop and introduce appropriate of so called green technologies coupled with sound delivery system, which ensures economic and ecological sustainability and optimum use of local resources emphasizing on technology capacity building of rural people. In this Endeavour, institutional linkages and active participation amongst voluntary agencies, science and technology based field groups, R & D institutions, financial agencies and above all, people who are primary stakeholders, become crucial for improving the quality of life in rural areas to achieve long term sustainability.

In above process, choice of technology can have a critical impact on many aspects of rural development, especially, the way we choose them, the way we innovate and design them, the way we deliver them to

masses. Therefore, technology must be carefully chosen to enable rural people to:

- acquire and imbibe knowledge of technologies appropriate to their needs and environment;
- upgrade their traditional skills and capabilities;
- minimize fatigue and reduce drudgery; and S&T should be capable of easy assimilation;
- generate significant and assured added value to existing methods of operation;
- generate employment and use local resources, both men and materials;
- need low capital investment and result in low cost production of goods;
- be capable of replication and adoption; and
- Blend harmoniously with existing ecosystems, leading to tangible improvements in the living conditions and self-sustained development of the rural people.

Thus, appropriate or green technologies, with above features, can play crucial role in building up local capacity, devising solutions for tackling the identified problems, and improving the lives of rural people by improving their surroundings and daily activities. Focus must be on technological empowerment of people with skills and critical thinking that fosters a sense of self-reliance and ability to evaluate what is beneficial or detrimental to their interests. This will improve their access to affordable, environmentally sound technologies and generate meaningful employment in local economic structure.

Once total system is in place with the complete technology package, the field group can gradually withdraw giving the entire responsibility to locally formed people groups organization for further dissemination.

#### APPLICATIONS OF SCIENCE AND TECHNOLOGY IN SHINING RURAL INDIA

It is intended to briefly give here some examples of technological developments which can have a direct impact on rural society. The key areas would include:

**Agricultural Research, Extension, Demonstration and Training:** Science and Technology have played an important role in promoting agriculture during the last several decades. The role of television and radio in rural education and extension services has been well documented. These technologies will continue to play a crucial role in and along with the new S&T.

S&T revolution is leading to the need to develop a new paradigm for agriculture. Beyond databases and information systems, applications of S&T to agriculture are appearing everywhere. S&T are profoundly transforming extension services through the use of multi-media technology, distance education technology, as

well as through innovative approaches based on interactive knowledge development processes. They are having a clear impact on our capacity to monitor the environmental impact on agriculture and degradation of natural resources through remote sensor data. GIS are opening new approaches to regional planning and to the management of natural resources.

In the context of agriculture, there are five key services or functions that are very closely related to S&T:

- access to information through different types of *Agricultural Information Systems* (AIS);
- monitoring the situation of natural resources and environmental impact through different *Information Processing Tools* (i.e. analysis of environment deterioration, soil erosion, deforestation, etc.);
- *Education and Communication Technologies* that are playing a very important role in generating new approaches to learning and knowledge management;
- *Networking* where S&T can contribute greatly to relating people/institutions among them and facilitating the emergence of 'Virtual Communities of Stakeholders' that generate and exchange information and knowledge among themselves. If well managed, networking is a first step in the direction of developing interactive knowledge development processes that may lead to learning networks; and
- *Decision Support System (DSS)* through which data and information provide relevant knowledge inputs for informed decision-making. These tools are playing an important role in converting information systems into knowledge systems.

The main objective of these S&T applications, from a development perspective, is that of empowering people through knowledge. It means developing in people a capacity to achieve their development objectives and goals through the generation, acquisition and use of knowledge.

**Energy:** Energy is essential for agriculture for inputs such as fertilizers, for delivery of water and for transportation. It is also needed to bring about rural industrialization. The developing nations consume per capita an energy of 500 Kg. coal equivalent; the developed, ones consume 10-20 times more. India today consumes hardly 200 Kg. i.e., half that even of the developing countries. 45% of the energy consumption in India is still from 'non commercial sources. The single largest source of energy continues to be firewood, and this will continue for quite some time. Therefore, large scale forestation efforts are called for on scientific lines and involving the rural population to meet their fuel wood needs. Biomass generation through techniques of tissue culture offers great promise.

The non-conventional energy sources which are renewable, decentralized and nonpolluting are particu-

larly relevant to rural areas which are unlikely to obtain electricity for their, needs for a longtime to come. More than 11 lacs, biogas plants have been setup by 2008-09. There are already about 60 lacs smokeless chulhas, 1 lacs solar cooker, 433 community biogas plants, 223 pumps, 85 urja grams, 1078 solar water pumping systems, 1275 solar domestic lighting systems, 546 community lighting and-TV systems, 1294 solar battery charging units and 281 biomass gasifiers. The magnitude of the effort is clearly much too small and needs replication and expansion on a very large scale. All these different sources have relevance as the inputs and areas of application differ and the combination of these can be optimized to suit individual situations. With large scale expansion of such sources of energy, decentralized rural industrialization leading to local gainful employment and conversion of local natural resources to finished products of much higher value will become feasible.

**Water:** Water is the most crucial single resource for the survival of human life. Every effort will have to be made to improve the availability of drinking water in rural areas; it is necessary to devise and implement scientific methods for water harvesting, conservation and recycling. Potable water supply in, the rural areas has to be given the highest priority. This effort calls for community participation, technology transfer, evaluation and assessment of existing rural water supply systems, studies on maintenance of water distribution system, development and rehabilitation of springs and use of hydraulic rams for water supply in hilly areas, use of solar energy for rural water supply, development of integrated package for water treatment, to make the water potable; etc.

Remote sensing is a powerful technique for water targeting. Low cost waste water collection and disposal systems already developed by some of our national laboratories need to be effectively deployed. For conversion of brackish water into potable water, technologies are available such as reverse osmosis, electro dialysis. Several plants based on these have been installed in the country. It is not necessary to list all the technologies which have been developed by national laboratories and which have direct relevance to the development of water supply for rural areas. But it is important to recognize the fact that the technologies and infrastructure are available and can be further developed. What is necessary is to establish appropriate linkages and mechanisms for transfer of technology to make most effective use of these.

**Housing:** Several technologies have been developed in the area of low cost building materials, designs and construction techniques. Central Building Research Institute (CBRI) Roorkee and Structural Engineering

Research Centre (SERC) Madras, both of them have done a great deal of work in these areas. CBRI, Roorkee has developed non-erodible mud plaster; for protection of mud walls from rain.

**Biotechnology:** In the field of biotechnology, developments relating to biofertilizers, aquaculture, biomass production through tissue culture techniques, embryo-transfer technology to upgrade cattle, herds, etc. have enormous, potential for employment generation and increasing efficiency and productivity for activities in daily life in rural areas, Mechanisms to make these effective on a large scale have to be worked out.

**Information Technology:** Use of information technology in sectors like agriculture, irrigation, energy, health; family planning, education, employment and transportation is vital for bringing about a major transformation in the rural sector. Information related to local resources, skills and need is important to carry out effective decentralized planning. The National Informatics Centre (NIC) set up in 1975 by the Department of Electronics has, developed a District Information System (DISNIC) NIC which is setting up a centre in each district of the country. There are a large number of training and information transfer programmes which have been based on the nationwide satellite communication network. This will help in making available valuable information for district and local planning.

**Space Technology:** There are a wide range of applications of remote sensing technology in areas of disaster warning for coastal fishermen, inland/marine fisheries, minor irrigation, water targeting for drinking water, wasteland identification, vegetation mapping, drought monitoring, etc. Already, with the use of space imagery ground water potential zone maps have been prepared for more than 370 districts which include 91 DPAP districts and 20 DDP districts. A new development relates to the forecast for better fish catches in the coastal regions by making use of the satellite data. It is expected that optimal utilization of space technology can result in better dissemination of information through satellite based communication and broadcasting. This will be of great relevance to remote areas.

**Technology Transfer:** It is clear that, in our country we have today a large number of technologies both high-tech as well as simple and low cost ones as also the ability to develop these. For these there is adequate S&T manpower and infrastructure spread throughout the country. What are most urgently called for are proper mechanisms for transfer of technology and an appreciation of what technologies are needed and are appropriate. For this academic institutions, research laboratories, schools and colleges in-



cluding agricultural medical and voluntary organizations have all to be brought together through suitable networking. At present, most of the work is fragmented and compartmentalized making the impact much less than the potential.

**Women:** Women constitute half of the human resources and today, in India, carry out a very significant part of the farming operations. They are involved in field operations, plantation activities, livestock management, and fisheries sericulture, bee-keeping, agriculture, forestry, etc. It is essential to organize proper training programmes for women and also to devise suitable implements which would reduce drudgery and improve their efficiency and productivity. Women can also use as most effective disseminators and communicators for simple agricultural and post-harvest technologies and for health care delivery systems. Unless the women are fully associated in the developmental programmes, the visible impact of these on society at large would not be felt. It is important that S&T relevant to programmes is disseminated and implemented as it will have a major multiplier impact.

In this context, the Government of Andhra Pradesh has provided a larger space for women self-help groups in its strategy for poverty alleviation and women empowerment. The Development of Women and Children in Rural Areas (DWACRA) Programme was started in 1982-83 in the State with UNICEF cooperation to provide opportunities of self-employment on a sustained basis for the rural poor women. National Institute of Agricultural Extension Management has provided multimedia computer system with UPS, printer and internet connectivity to Mutually Aided Cooperative Thrift and Credit Societies (MACTCS) organized by DWARCA groups. Four members identified by the group were trained in basic computer operations and internet browsing. Multimedia CDs on Agriculture-Intensive Self-Learning Packages on Watershed Management, Vyavasya, Panchangam (Encyclopedia of Agricultural Practices), Paddy Cotton, Mayo and Coconut Cultivation, Expert Systems on Selected Crops and Rural Development—pickle making, child labor, child education, nutrition and health education, etc. were given to all the groups. A user-friendly accounting package was given to all the MACTCS (microfinance gateway) like Aradana, Aaradhya, lakshmi etc. to maintain their accounts and two members were trained to use it.

The experiences of these groups have shown that they have been using the internet in innovative ways. They are browsing DRDA Websites for government programmes and schemes. They are looking for weather forecasts, market prices, job opportunities and news on the net regularly. They have also started to charge some of these services selectively. This has provided a

good opportunity to the rural information kiosks to earn some revenue. Farmers are also using the net for getting technical advice online from various sources. Rural people have created their own e-mail accounts for faster communication. They are sending mails to DRDA, district collector and other district and state-level officials.

The studies conducted on the impact of these groups on women empowerment highlighted that woman's access to and control over their savings, credit and income has improved. Further, women have improved freedom to move and interact with the officials and other women after joining the SHGs of DWACRA. But, the studies also have revealed that empowerment varied across different social groups since issues of women empowerment are interlocked with caste, religion, headship of households and their age. SHGs are facilitated by ICTs. Most of the rural women who are the members of SHGs they have of knowledge of computer and technology so by these SHGs improve their status.

**Employment:** Economic activities in the rural areas leading to significant gainful, employment can be generated with inputs of S&T, especially in the fields of:

- (i) Improved seed varieties agronomic practices appropriate to the agro ecological conservation, low cost inputs including energy, mixed, integrated farming systems and optimal land use through surveys and education are useful for boosting agricultural production.
- (ii) Animal husbandry can be a very important source of primary as well as subsidiary, occupation. New technologies are available today for improvement of the genetic stock and their output.
- (iii) Setting up of small scale industries for self employment using the technologies generated by our national laboratories and S&T based entrepreneurship development.
- (iv) Training and skill improvement of the rural people.
- (v) Simple science and technology education, awareness building and popularization of scientific methods and approaches.
- (vi) Biomass cultivation, utilization and agro-processing through new biotechnological processes.
- (vii) New low-cost methods for health delivery systems.

**Education:** in India S&T improved our education system enough but there is need more so we have discuss here some important facts that are pointed by U.S. Department of education ,Reimagining the role of technology in education,2017. According to this

national education technology plan updates various sections that are listed as:

- Section 1. Learning –engaging and empowering learning through technology.
- Section 2. Teaching –teaching with technology.
- Section 3. Leadership –creating a culture and conditions for innovation and change.
- Section 4. Assessment –measuring for learning.
- Section 5. Infrastructure –enabling access and effective

**Technology in DWCRA:** firstly to understand the role of technology in DWCRA, it is necessary to know what is DWCRA it stands for Development of Women and Children in Rural Areas .so for this development programmes there is need of technology at every step without this we can imagine any progress so in 1986 an autonomous body came into existence .named (CAPART) mean Council for Advancement of people’s action and rural technology. It is the result of the amalgamation of two agencies that were (CART) and (PADI).CAPART is the nodal agencies for catalyzing and coordinating between voluntary organizations and Govt. For the sustainable development of rural areas. It is function under the aegis of Ministry of Rural Development and Govt. of India. Today, this agency is the major promoters of rural development in India, assisting over 12,000 voluntary organizations across the country. This organization helps the whole department of DWCRA whose aims and objectives of the programmes are listed below:

- i.) Improve the status and quality of life of poor women and children in rural areas.
- ii.) To improve their earning capacity.
- iii.) Improving the impact of ongoing development programmes by stimulating, supplementing, strengthening them etc.

### **SUGGESTIONS FOR EFFECTIVE S&T IMPLEMENTATION IN MAKING RURAL INDIA SHINE**

1. Limited local participation, lack of availability of local resources, fractured relationship with state agencies as some of the factors for the inability of S&T projects to deliver their full range of outputs in rural areas.
2. E-governance is invariably a passive system of information empowerment.
3. There is need for promoting participatory methodologies of content creation
4. The approach to rural women and men should be one of partnership and not patronage. In the field of agriculture, a Farmer Participatory Knowledge System (FPKS) could replace the

existing beneficiary and patronage approach to knowledge dissemination. Information should be demand driven and should be relevant in terms of time and space.

4. There is need for more on-farm and non-farm employment opportunities in villages. This will be possible only if there is diversification of farming systems and value addition to primary products through improved post-harvest technology.
5. Training should be with reference to market-driven skills.
6. Small-scale industries and khadi and village industries should receive particular attention from the point of view of the up gradation of both technology and marketing skills. There is also need for synergy between the private sector and public and cooperative sectors in promoting more avenues for skilled jobs in villages.
7. The usefulness of a computer-aided knowledge centre in villages will be directly proportional to the social, ecological and economic significance of the static and dynamic information being provided.
8. A culture of change, knowledge and lifelong learning should be encouraged by rural communities and the government agencies serving them.
9. Online services should be designed with a mix of free and fee-based services so as to ensure commercial sustainability of rural area.
10. As a major consumer of products and services, governments in developing countries can also lead by way of example in the use of S&T, implementing best organizational practices and spurring local markets in rural areas. Such initiatives should have a strong grounding in local communities of villages. Online and offline forums should be promoted for communities of interest and communities of practice to exchange knowledge on harnessing and creating S&T in the rural context. Multi-actor alliances targeting rural areas should be encouraged and nurtured. Creating funding options for rural areas should be explored.
11. Special financing should be set aside for such initiatives involving marginalized communities, physically challenged, refugees, migrant population and youths. Measures should be implemented to increase e-literacy in rural areas. Technical, managerial and design capacity should be built up in the adoption of S&T for rural communities, creation and maintenance of secure.

12. Government of India should liberalize policies for the operation of community and ham radio stations. This will help to confer the benefits of the knowledge age to every woman and man in a village. Reaching the unreached and including the excluded will and non-governmental, voluntary organizations, but a key role in this would be of the scientists, and 'challenge before the scientific community today' is to accept and fulfill this task. Much attention is needed in order to make rural India 'shine' because India cannot 'shine' without the 'shining' of rural India be possible only through an integrated S&T system.

## CONCLUSIONS

Scientific approaches, studies and innovations are absolutely essential to solve the urgent problems that are being faced today in the rural areas. India being a very large country, with diverse geographical and ecological conditions, and varied socio cultural background of the rural population, a uniform prescription or model would be inappropriate for application in all the regions. The prescriptions will have, to be location specific, based on the local natural resources, using fully the skills of the local population to meet their aspirations and basic needs.

All the States and Union Territories have today has an organized institutional structure in the form of State S&T Council or Departments. These can act as focal points for generating specific S&T programmes and activities for rural development. As mentioned earlier, the Central Science Departments and agencies have their own infrastructure spread over the different States. Therefore there can be a very close organic and live linkage between the Central S&T agencies and, the State structures for demonstration, dissemination of information, transfer of technology and extension.

The task is not easy when one takes note of the highly variable socio-cultural patterns and complex problems. But it can be accomplished provided the scientific community is motivated and would accept the challenge, and if there is appropriate local involvement. As stated by our first Prime Minister, "*It is Science alone that can solve the problems of hunger and poverty .....*" We will have to work towards achieving this goal of harnessing science in all spheres of rural development, because ultimately the total national development would depend on the rapid progress of the rural areas. This will call for a joint effort of scientists, administrators and local people with the full support of the political structures.

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