

Digital India towards Development of Agriculture and Rural Development: An Overview

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1. Introduction

It has been estimated that India would need nearly 300 million tones of food grains by 2030. In other words, by the year 2020, we may need about 122million tones of rice, 102million tones of wheat, 41million tones of coarse grains and 28 million tones of pulses, 143million tones of milk.

Information Technology and Digital India is involves electronic processing, storage and communication of information, where anything that can be represented in digital form is included in the term information. Macmillan dictionary of IT defines information technology as “the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a micro-electronics based combination of computing and telecommunications”. Everybody knows that agriculture is the mainstay of Indian economy. More than 55 percent of the country's populations still depend on agriculture. As of 2011, rural areas host 742 million or over 55 percent of population. About 55 percent of India's total workforce is rural. Indian agriculture has surpassed many obstacles and successfully moved from the status of being a self deficient country to a self sufficient one in food grains as well as in several other sectors of agriculture. But there are threats of this achievement being soon gaped down by the monstrous growth of population.

It is well accepted fact that future is going to be an information age where nation's prosperity will depend on its ability to process information. IT has connected the world globally and is now changing our lifestyle and social consciousness dynamically. Of late, it has emerged as a best tool for information sharing and mutual communication. Agriculture and rural sector have also been greatly influenced by IT in the present era, but the share of IT in agriculture is only 1.7percent. Agriculture is still the back bone of Indian economy. More than 65 percent of the population lives in rural areas. Agriculture and rural sector plays a very important role for the development of the country. So there is a great need to collaborate IT with agriculture.

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Keywords: Digital India Development, Agriculture, Rural Development

1.2 Need of IT in Agricultural and Rural Development

Everybody knows that agriculture is the mainstay of Indian economy. More than 55 percent of the country's populations still depends on agriculture. As of 2011, rural areas host 742 million or over 55 percent of population.

About 55 percent of India's total workforce is rural. Indian agriculture has surpassed many obstacles and successfully moved from the status of being a self deficient country to a self sufficient one in food grains as well as in several other sectors of agriculture. But there are threats of this achievement being soon galped down by the monstrous growth of population. It has been estimated that India would need nearly 300million tones of food grains by 2030. In other words, by the year 2020, we may need about 122million tones of rice, 102million tones of wheat, 41million tones of coarse grains and 28 million tones of pulses, 143million tones of milk. The natural resources are depleting day by day and it is going to be a big challenge to feed the population. To ensure food security and maintain sustainable agriculture so that our country is hunger free in coming years, we need to strengthen farmers by timely and expert suggestions on recent technologies applicable in agricultural and rural development.

The needs of agriculture are:

- To reduce knowledge gaps and increase knowledge sharing for increasing productivity and boosting growth in rural areas.
- Empowering farmers with relevant and timely information about different crop variety.
- To reduce farming risks.

Rural areas are predominantly under developed with poor infrastructure, electricity and roads. Rural people are very few as producers of information, and left with less access than urban people to the information and networking resources. Naturally they have fewer possibilities of orienting technology to address their specific needs.

To achieve a sustainable level of food production it is necessary that they have seamless access to:

- Information on weather, production and cultivation techniques, seeds and fertilizers, plant nutrients and water usage,
- Funds and liability coverage through agri-finance and agri-insurance,
- Assistance from universities on new techniques eg. Biotechnology, used to increase production yield,
- Market infrastructure like warehouses and cold chain management.

In the current scenario, the role of information technology assumes great importance and only with proper integration of IT with agriculture and rural sector, the problems can be solved and country can move towards a sustainable production.

Recognizing the vast scope of information exchange, many corporate houses have launched their IT-enabled services in the rural areas and have been successful beyond doubt.

While introducing IT in agriculture and rural development, what needs to be taken care of its adoption of cost effective IT-based systems. The task is difficult and the path jerky, but once achieved in totality, this will go a long way towards improving the living standards of India's rural masses.

IT based agriculture will certainly enhance both quality and quantity of the farm produce in general.

1.3 Application of IT in Agriculture and Rural Development

Application of Information Technology operations in agriculture and rural development may be described as follows:

1.3.1 Communication Technology in Agriculture and Rural Development: Information is power. More the person is informed, more he is empowered. Information is a flowing asset which is continuously generated, disseminated and gets utilized. A flow of information needs an unhindered information communication system. But is a paradox for rural India that it is one of the least communicated populations of the world. Recent advances in space science and information communication technology has ushered in a great opportunity for this neglected mass of India.

Internet provides huge, advanced information on just a click of the computer mouse. The rural masses are largely disconnected with the outer world. Internet is the only way to make them global and also an effective medium to introduce the world to those rural masses and their socio-cultural aspects. Various internet based inventions have been designed to uplift the rural areas. Some of them are:-

1. **e-agriculture:** Agriculture previously was a function of land, labour and capital but nowadays farmers want to sell more and more produce of the best quality at a competitive price. Under such a scenario technology plays a major role. e-Agriculture means IT in agriculture, IT means internet which not only provides technology for farming methods but also provides the best source to get farm inputs and the best destination to sell their produce at the best price. Internet based interventions is also suitable for extension agents and field workers in providing updated information to the villagers. Several technologies have been developed for taking into consideration the agro-ecological situation of the region and entered in we world from where users can utilized it by surfing various rural portals.

The government has established several community information centers (CICs) and is trying to convert PCOs into cyber Kiosks form where the rural community can get internet facilities. ITCs *e-chaupal* also provides internet facility in the rural areas. The warna Wired Village Project of Maharashtra, the information village project in Pondichery, the NDDDB have established IT-based machine for milk cooperatives.

2. **E-Education:** The rural population is largely illiterate and uneducated. Many educational experts are convinced that the only way quality education can be delivered to masses, cost-effectively, is through IT. Developing a program to train villagers core group(VCG) including women and enthusiastic youth, will ensure that IT reaches the common person even in remotest parts of the country.

3. **E-Health service:** Rural population is always struggling on the health front. Information technology tools are available to improve communication, consultation and two way refer all linkages from primary health care to tertiary health care level. Telemedicine is a marriage of IT and medicine which in the near future is going to be benefit the rural masses at large. Telemedicine can help in remote diagnostic services and extension of super specialty hospital treatment for people in the rural areas.

4. **e-Marketing:** For rural areas, proper disposal of farm produce at better price is always a perpetual problem. Internet not only provide the prevailing price of the farm produce but the place of disposal also. Internet has strengthened the marketing information and marketing intelligence services. By sending e-mails to the buyer, one can sell and negotiate the price of produce without going to the buyer's door and paying much to the middlemen.

5. **e-banking:** To provide the banking facility and to develop banking habit among the rural population, e-banking is essential. It facilitates e-finance and e-insurance to the farmers quickly and without much paper work. ATM facilities are becoming very popular among various e-banking services. Queries related to loan and savings can easily be obtained through internet having e-banking facilities.
6. **e-Finance:** Rural population are a resource poor mass. They need credit for running their business. Breaking the monopoly of private creditors and timely disbursement of credit without much paper work is possible through e-finance.
7. **e-Insurance:** Rural population is having almost negligible insurance cover. If the head or working manpower unfortunately dies or is subjected to any accident, such family meets the misery of poverty. Government of India has not only started a subsidized scheme to insure the rural population but also their crops, so their livelihood must does not get much affected from unforeseen calamities. e-insurance is designed to cover it all at faster speed without much paper work.
8. **e-Government:** It refers to ICT enable route of governance. Through e-governance, government can connect to the rural masses with their administrator, so they can ask their problem status of solution. Various world bank and centrally sponsored e-governance projects are in operation, e.g. Meghdoot in Madhya Pradesh and Bhoomi in Karnataka. NICNET network operation over 700VSATS are being used to provide nationwide data communication link between district, and state capitals for administrative planning and other applications.
9. **e-Panchayat:** For the first time in the country, electronic knowledge based Panchayat is introduced in Andhra Pradesh by National Information Centre (NIC) of Department of information Technology (DIT). As a pilot basis in Ramachandrapuram Gram Panchayat in Medak District of A.P., here all the functions of Panchayath are computerized and web enabled. Internet based service for birth and death registrations, house tax assessment and collection, trade license, old age pension, work monitoring, financial accounting, MIS for Panchayath are all being executed in computerized e-panchayath system. Additional services such as market information and agricultural extension service are also being provided to the citizens of the village from e-panchayath.

1.3.2 Remote Sensing in Agriculture: The measurement of acquisition of information of an object or phenomenon, by a recording device that is not in physical or intimate contact with the object is remote sensing. Remote sensing is the science and art of acquiring information (special, spatial and temporal) about material objects, area or phenomenon under investigation.

Remote sensing in agriculture is an important promising tool in agricultural information and management system. Comprehensive, reliable and timely information on agricultural resources are very much necessary for a country like India whose mainstay of the economy is agriculture. infact, agricultural survey is a backbone of planning and allocation of the limited resources to different sectors of the economy. The country needs to uses this technology more and more to address various agricultural problems. Following are a some techniques of how Remote Sensing can currently meet the information needs in agriculture:

1. **Agro-climatic mapping:** Remote sensing data based agro-climatic map helps in crop selection and guides further on different farming operations on the basis of local resources and agro-climatic situations prevailing over the region. It lessens the farming risk and improves income in rural areas.
2. **Soil mapping:** Conjunctive use of Remote sensing data and collateral information like-lithology, physiography has enabled mapping soils at different scales, which is helpful in land use planning.
3. **Land use/land cover mapping:** Map of land use/ land cover prepared on the basis of space borne multi spectral data have provided a sound data base for agro-climate regional planning for increasing food production, reclamation of degraded lands etc. A nation wide wet land mapping by using IRS LISS-II data carried for comprehensive planning of wet land ecology and inland fisheries.
4. **Watershed development:** Remote sensing data based mapping of watershed helps in proper planning of arable and non-arable land and arrangement of network of natural drains. It not only helps in curbing different types of erosion but also helps in resource generation in the area.
5. **Agricultural drought assessment:** Vegetation index (VI) derived from space borne data is sensitive to moisture stress in crops and serves a surrogate measure to assess agricultural drought.
6. **Pest assessment and control:** Possible pest investigation warning is the key to preventive measure of first control which is not only cheap but also eco-friendly. Locust control through remote sensing might play vital role in future.
7. **Precision farming technology (PFT):** It is an emerging technology that allows farmers to adjust inputs, duly considering the in field variability of soil, crop condition and resulting in the reduction of cost of production that is why it is sometimes referred as site specific farming (SSF). The PFT using Global Positioning System(GPS) which comprises of satellites (among them most of all are Remote sensing satellites), software, some hardware and technical staff.

1.4 Problem in Using Information Technology

Information technology is get to reach India at a large scale. Poor educational status, functional literacy on use of computers, poor infrastructural facilities like lack of power, public utilities are hurdles towards gaining access to farm information. The second aspect is most of the information available on the websites and internet is on English with a web content of 64 percent which 5 percent of the Indian population know. The third problem is lack of credit towards buying IT devices wherein it cost a period of 40months annual income in rural areas to buy a computer, a basic input of information revolution. The last aspect is absence of community group efforts in rural areas where people are not organized and divided on religion, caste and other social basis is a hindrance gaining access to information technology.

1.5 Measures to Boost Information Technology skill among Rural / Farm Communities

The following measures are suggested to boost IT skill in agriculture and rural development:

- Rural people need to be encouraged to form groups wherein they can gain access to schemes being offered by financial institutions. Apex bodies like APEDA for starting up community computer centers or kiosks.

- Development of the integrated set of websites, content management tools and multimedia tools available in regional languages for the farmers to benefits.
- Need for establishment of rural development Data Centre based around IT environment as effective sources of communication link for rural development. The focus should be on the growing concept of E-villages worked out to introduce basic designs based around IT platform, which forms the basis of foundation of rural development process.
- Development of workshops and variety of training programs to strengthen local capacity for use of IT as a tool of employment.
- Long term credit loans and subsidies can be given to SHGs, youth clubs in starting cyber cafes in rural areas by central government and state governments to bring about increased electronic connectivity in rural areas.
- Repacking of internet – accessed information and combining internet technology with traditional or more effective dissemination medium like the radio, T.V., street theater, C.D. ROMs and even folklore songs.

1.6 Conclusion

Ultimately, it can be rightly stated that the potential impact of IT on agriculture and rural development would be enormous. In future, IT will serve as a predominant role for fulfilling the needs of a Second Green Revolution. Like several revolutions in agriculture i.e. Green Revolution, White Revolution, Blue Revolution, Yellow Revolution, Pink Revolution, Silver Revolution, Round Revolution and so on. The Information Revolution will undoubtedly change the scenario. The core concern in Indian agriculture and rural development is the necessity to increase productivity, employment and income for poor segments of the agricultural and rural population. IT tools facilitate the farmers to be aware of the agricultural situation in India as well as abroad and accordingly undertake agricultural production.

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