

A REVIEW

Role of information technology in Indian Agriculture

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ABSTRACT

In the present century Information Technology is the buzz technology now-a-days and is helping to exchange the information in fast and easier way at the right time. Information Technology is taking lead in all the agricultural activities of a nation and has transformed the whole world into a global village with a global economy. Information technology has played a significant role in improving the quality of life in rural areas and helped an average Indian farmer to get relevant information regarding agro-inputs, market support, management of farm, agri business, agro finance, crop production technologies and agro processing. The crop forecasting, input management, command area management, watershed management, land and water resources development, drinking water potential mapping precision management, natural disaster management, fishery management, hill area development and post harvest management are the key areas, where Information Technology can play its imperative impact. Large sections of the farming community, particularly the rural folk, do not have access to the huge knowledge base acquired by agricultural universities, extension centers and businesses however, internet and mobile networks have the potential to provide agro-information services that are affordable, relevant to needs, searchable and up to date. Information Technology can provide vital access to information, markets by connecting the rural poor and marginalized to the world's information resources and opportunities.

KEY WORDS : Role, Information technology

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INTRODUCTION

India is moving fast towards becoming an information society as the Government of India is paying due attention to the use of information technology (IT). Government of India constituted a National Task Force on IT and Software Development in May 1998 with the purpose of formulating a long-term National IT Policy to convert India into an IT software superpower. These steps are helping India to shift from an “economy of goods” to a “knowledge economy” or “knowledge driven economy”. The beginning of the knowledge society has been made through creation of parks and corridors and the Prime Minister has given a mission of converting India into a “knowledge society” by the year 2008. Today, India is one of the largest exporters of knowledge workers (Abdul Kalam).

The written history of agriculture in India dates back to the Rigveda, written about 1100 BC (The story of India, 2012). Today, India ranks second worldwide in farm output. Agriculture and allied sectors like forestry and fisheries accounted for 13.7 per cent of the GDP (Gross Domestic Product) in 2013 (CIA Factbook: India, 2008) about 50 per cent of the total workforce (India Brand Equity Foundation Agriculture and Food in India, 2013 and Shaik *et al.*, 2004). The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based

economic growth. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India. Information is power and power is information. Without information there can be no growth. Information is penetrating into rural India as well, without its presence there, we cannot think about development of the entire country. Information technology (IT), as defined by the Information Technology Association of America (ITAA), is “the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware.” IT deals with the use of electronic computers and computer software to convert, store, protect, process, transmit and securely retrieve information. Information Technology is rapidly becoming more and more visible in society and agriculture. IT refers to how we use information, how we compute information, and how we communicate information to people (Verma, 2012). People must have computer and information technology. To participate and make informed decisions in the agricultural industry a person must have ability to gather, process and manipulate data.

Role of information technology in agricultural research management :

The major contribution of agricultural research in India has been reflected in various agricultural revolutions during the post independence period like green, white, blue and yellow revolutions in the fields of Cereal crops (wheat), Milk, Fisheries and the Oil Seeds witnessing the Golden Revolution of horticulture crop production. The new areas of concerns for agricultural research included the sustainability in agriculture, food security and demand driven research than merely the supply driven and thus the findings of laboratory research need to reach the unreached. Information Technology can be successfully utilized for proper transfer of technology to the farming community and also those living in remote areas of villages. However, there is still scope for tapping and harnessing all available resources in areas of application of Information Technology. Hence, it is worthwhile to strengthen the role of IT in agricultural research management. The changing scenario under Indian and global context affects the entire process of agricultural research, especially the identification of thrust areas of research. The skill to distinguish between what is urgent and what is important will hold key to the success in deciding priorities. Such skill can be acquired by IT. The benefits of Internet connectivity can be utilized for better collaboration amongst scientists for exchange of their views

Role of IT in agricultural extension management :

The present age is termed as an “information age” and people want adequate and authentic information as early as possible. Farmers as human beings are also anxious and become more desirous with the advancement in science and technology to know what is happening in the field of agriculture. Farmers have enthusiasm to obtain knowledge, particularly in the field of modern agriculture to become psychologically strong and conducive with necessary capacities to adopt modern methods of agriculture. In India, it is very difficult to contact each and every farmer in limited time to communicate latest agricultural technology. To overcome this difficulty, various mass media are certainly most effective avenues to convey information to the broad means of people, particularly to the huge illiterate segment of the farmers. In India among various media, radio, television, literature and newspapers are certainly most utilized by the extension workers to transfer agricultural technology to the huge illiterate and literate segments of the rural. This revolutionize is due to more expansion in farming system fairly than the earlier accent of yield improvement. Even at previous junctures of agriculture extension growth, the style was information provide oriented to a certain extent than farmers’ demands driven. The advancement made in information technology is so fast that every areas of livelihood have to be well organized to strap up such technology. We have experienced that generally the benefits of information technology have restricted primarily to the urban areas. This is only due to lack of understanding about the new Information Technology. However, as a result of new approach of strengthening the communication and training centers like Agricultural Science Centers and Farmers Training Centers, the whole agriculture extension structure has been reinforced again. With a view to understanding the impact of IT in transfer of agricultural technology, the resource documentation and its application play central role as the agriculture extension approaches are shifting gradually. The Agricultural Extension System (AES) has five important pre requisites 1.Regular training and maintaining of extension workers and functionaries at various levels in the specific knowledge and skills. 2. Monitoring the AES and understanding the

constraints. 3. Strong information, documentation and publication support. 4. Effective institutional network for synergetic support. 5. Develop national and international linkages (Shaik *et al.*, 2004). For this strong information, documentation and publication support are very pivotal. The production of CD ROM on special topics can be the best mean for future resources documentations. E-Extension is a new term coined for electronic extension approach, which is otherwise can be called as Information Technology oriented Extension. The network between different agencies like Agricultural Science Centers (Known as Krushi Vigyan Kendra), Farmers Training Centers, Agricultural Technology Management Agency and Information Shops needs to be developed for useful linkage and proper utilization of available resources. The human resources will have to be trained in usage of IT Tools and all infrastructure facilities required for strengthening the Agricultural extension System and Services.

Role of IT in Agro-based rural development :

It is assumed that 60 to 85 per cent of household consumption belongs to agricultural products so agriculture plays important role in industrial development, it provides raw materials to industries like cotton textiles, jute, sugar, tobacco, edible and non edible oils, leather, plantation industries etc. The food processing industries is also dependent on agriculture. Lots of agro based materials are exported in European and Gulf countries by India. In all such agro based industries, role of IT needs to be improved. IT Tools are very useful in creating effective linkages in agro based industry activities. These linkages are concerning dissemination of useful information. Linkages of the producers can be with State Federations and National Federation and Board, Finance Corporation. Advertisement is best way to add value of products. This market again can be very well established with available database of product wise information on products with comprising data of competing nations of the world.

Role of IT in agricultural production :

The IT Approach for commercial crops, horticultural crops or floriculture have to focus on Integrated System may be for plant nutrition or plant protection. The well established Integrated Plant Nutrition Approach and Management and Integrated Pest Management (IPM) need to be strengthened with the help of IT Tools. The Post Production Technology (PPT) needs to be utilized properly. The end user, beneficiaries and all concerned especially with export of agricultural produce need to be trained to access the Internet facilities available as one of the most useful IT Tools of the computer era.

Role of IT in agricultural education management :

The higher education system has undergone many changes. In India, only 6 per cent of Indian population in the age groups of 18 to 23 years is getting the benefit of higher education. With this background in view, we can be able to understand, how difficult it is to face the challenges of higher education in 21st Century which is being dominated by the Information Technology. This clearly indicates that all out efforts need to be made in higher education especially in the field of science and technology to harness the youth potential of rural India. It is estimated that as compared to enrolment of Indian youth (18-23 years), the enrolment is 100 per cent in Canada, 80 per cent in USA, 50 per cent in France and 30 per cent in UK. Even in some of the less developed countries like Thailand, Indonesia, Mexico and Brazil, enrolment ratios are higher than that in India. It is, therefore, necessary to find out answer to this major problem. This could be only possible through increasing the accessibility of higher education through I.T. and innovative mode of education such as Distance Education or Correspondence Course System. At this stage intervention of IT is required. In order to see successful integration of IT in Agricultural Education we need to empower teachers of agricultural schools, colleges and universities and so also administrators and educational planners. For this purpose at the elementary stage, we are required to arrange training of these personnel in fundamentals of Computers and then gradually introduce the advanced modules for Computer applications. Teachers need to be trained to use computer to prepare their lesson plan, presentations 'on power point, photo scanning and use of LCD. The educational planners and administrators should be trained to prepare Annual Budget Plan, for teaching aids, resource person and material expenditure, infrastructure budget requirements, time tables to monitor and scheduling the teaching resources, to build up and maintain comprehensive students records and students files etc. Teacher's role has been changed in IT based

agricultural education. Now instead of just information carriers, they have also become information guide or information facilitators to the learners, who have always multiple sources of information. The Teachers of IT based agricultural education need to be trained to prepare for “Virtual Class Room”. For this, they should prepare slides, record their sound of lecture on Computer itself and this recorded lecture is being attended by his learners in ‘Virtual Class’. The module courses will have to be designed for virtual Class Studies and ‘Network Based Education’ or ‘Information and Communication Technology (ICT)’. IT along with Internet Expertise is boon to the Distance mode of education. Under Open University or School Education pattern, the learners do attend classes by visiting their respective study centres and attend lectures of their teacher counselors. However, with the introduction of IT the Learner need not come to institutes and study centre but they can attend his virtual class at his home. For this purpose teachers are required to train to prepare ‘Training Capsule’ for virtual class through which the students or learners can access on their internet facilities. The teachers will have to be trained in E-mail, chatting, surfing, teleconferencing, video conferencing and all latest communication technologies. The learners or students in Agricultural School and Colleges need to be well acquainted with ‘understanding the lessons projected on the LCD Screen, using power point presentation. Until now the learners of classrooms are in habits of listening lectures with the help of overhead projectors (OHP). Sometimes video films, online internet presentations can also be shown on screen with LCD. The use of CD ROM, on specialized topics on agriculture can also be displayed on computer monitors. With the advent of Internet, Technology, the learners can attend ‘Virtual Class’ on the monitor of their computer at their homes or workplace. Here the Learners will have to be trained in using Internet Technology *i.e.* in this case how to log on, do searching and save the information on computer itself. After attending ‘Virtual Class’ on Computer, one can appear for ‘ON LINE’ examination test wherein the student will be required to type answer on computer and he will know his evaluation report on screen immediately. Virtual classes are stepping stones for building future Virtual Colleges and Virtual Universities. The Virtual Colleges and Virtual Universities are equally useful for both thinly and thickly populated countries. To prepare the agricultural graduates capable to meet the challenges of the new millennium, they should be given course on International Agriculture, WTO, Trade Related Intellectual Property Rights (TRIPs), Global Conventions on Climate, Biodiversity and Desertification, Computer Technology, Patent and Trade Literacy, International Standards. For this IT can play important role. So Introduction to Computers, Application of Software, Data Base Management Systems, PowerPoint, Drawing Software, Computer Programming, Multimedia, Internet, role of TV and Radio in ICT should be a part of their course curriculum. There are a large number of dropouts in rural schools and a major segment of the rural population is still unreachable. Every State Agriculture Department should establish independent cells for Distance Education for training these dropouts and rural youth for imparting short-term courses in newer skills in agriculture and allied sciences to improve farming. For this IT can play important role. Now-a-days there is no any direct like between all the agricultural colleges of India. IT can be an effective mean to link all the agricultural colleges of India. In academic field it is said that if we have good contacts with other instaurations we can be able to know their academic development and compare our work with other them. This kind of contacts gives us opportunity to make necessary changes in out style of work for desired result. IT facility makes person cosmopolitan in nature. Exchange of useful information like collection of question papers, recent trend, information on seminar, symposium, workshop, training and any other academic developmental activity can be known easily through the IT. It should be the foremost duty of Indian agricultural educational planners to introduce IT in all the agricultural colleges of India and link them with each other to make best use the libraries of agricultural colleges and faculties. Some basic reforms required for this is training to the library personnel of the agricultural universities and colleges in latest computerization process of libraries with newly introduced IT. The establishment of databank in libraries facilitate will be useful not only to the researchers and teachers but also very useful for students as a future researchers. The human resource management for agricultural education has also assumed an extra ordinary significance as the IT involvement has supplemented a new breadth of virtual classrooms, accessibility of information through Internet.

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