International Journal of Research
Available at https://edupediapublications.org/journal
p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 02 Issue 12
December 2015

Global Challenges in E-Agriculture

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ABSTRACT- *Agriculture in India is one of the most important sectors of its economy. It is the way of livelihood of almost two thirds of the work force in the country. One of the biggest success stories of sovereign India is the rapid strides made in the field of agriculture. From a nation dependent on food imports to feed its population, India today is not only self-sufficient in grain production but also has substantial reserves. In India, Agriculture is considered to be a primary occupation for a most division of population. E-Agriculture is a rising field focusing on the improvement of rural and agricultural development through advanced information and communication processes. The development of agriculture has been on under development for the past few years due to lack of Agriculture knowledge and environmental changes. The main aim of this paper is focus on the global challenges or trends in E-Agriculture. E-Agriculture is a platform for supporting marketing of agricultural products.*

Keywords- E-Agriculture, ICT, E-commerce, Environmental Change.

INTRODUCTION - E-Agriculture is a global Community of Practice, where people from all over the world exchange information, ideas, and resources related to the use of information and communication technologies (ICT) for sustainable agriculture and rural development. With over 14,000 members from 170 countries and territories, the E-Agriculture Community is made up of individual stakeholders such as information and communication specialists, researchers, farmers, students, policy makers, business people, development practitioners, and others. The members have a common interest that brings us together: improving policies and processes around the use of ICT in support of agriculture and rural

development, in order to have a positive impact on rural livelihoods.

E-Agriculture is an emerging field in the crossroads of agricultural informatics, agricultural development and free enterprise, referring to agricultural services, technology dissemination, and information delivered or enhanced through the Internet and related technologies. More specifically, it involves the conceptualization, design, development, evaluation and application of new (innovative) ways to use existing or emerging information and communication technologies (ICTs).E-Agriculture goes beyond technology, to promote the addition of technology with multimedia, knowledge and culture, with the aim of improving communication and knowledge processes between various actors in agriculture locally, regionally and worldwide. Facilitation, support of standards and norms, technical support, capacity building, education, and extension are all key components to e-Agriculture. There are several types of activity related to e-agriculture applications that are widely recognized around the world today. The delivery of agricultural information and knowledge services (i.e. market prices, extension services, etc) using the Internet and related technologies falls under the definition of e-Agriculture. More advanced applications of e agriculture in farming exist in the use of sophisticated ICTs such as satellite systems, Global Positioning Systems (GPS), advanced computers and electronic systems to improve the quantity and quality of production. In India agriculture is a major occupation for most part of population. Most rural population depends upon agriculture as their important occupation.

CURRENT SCENARIO OF AGRICULTURE SECTOR:

The occupational structure of India is dominated by the agricultural sector, manufacturing sector and the service sector is lagging far behind in this context. This shows that India is predominantly an agricultural economy and hence it requires strongest protection and development of its agricultural resources. India is facing certain "Agricultural Challenges" that must be resolved as soon as possible. The major challenges to "Agriculture Sector in India" are:

1) Insufficient agricultural infrastructure and support facilities,

2) Insufficient institutional capacity to deliver farmers specific services,

3) Lack of awareness regarding suitable agricultural methods among the farmers,

4) Agricultural content development and its up gradations,

5) Ownership issues of the public and government generated data,

6) Inadequate use of Public-Private Partnerships in India,

7) Lack of "Common Platforms" for the farmers in India,

8) Absence of an "Agricultural Think-Tank" in India,

9) Insufficient use of ICT for agricultural purposes, etc.

GLOBAL TRENDS IN E-AGRICULTURE:

A. Technology-based Solutions

Applications of E-Agriculture in intensive agricultural systems in developed countries are gearing towards using sophisticated technologies to improve the quantity and quality of production, in order to maximize profits. This is the case in precision agriculture in which farmers are harnessing computer and satellite technologies to cut costs, improve yields and protect the environment; and e-commerce (or e-marketing) in which the marketing and sale of agricultural products is conducted over electronic networks such as the Internet and extranets. On the other hand in many developing countries farmers" access to information is improved through grass root level initiatives of using ICTs as well as distance education modalities to enhance the knowledge base among service providers.

B. Precision Agriculture

In precision agriculture or site-specific farming, farmers are using ICTs and other technologies to obtain more precise information about agricultural resources which allow them to identify, analyze, and manage the spatial and temporal variability of soil and plants for optimum profitability, sustainability, and protection of the environment .Precision agriculture is described as:"A system to manage farm resources better. Precision farming is an information technology based management system now possible because of several technologies currently available to agriculture. Precision agriculture is an advanced e-agriculture application. It makes use of five major components of technology:

1) Geographical Information Systems (GIS) for analysis and management of spatial data and mapping;

2) Remote Sensing to identify and Global Positioning Systems (GPS) to locate and define spatial features or activities that

contribute to the quality of site-specific practices;

3) Variable Rate Technology (VRT) allowing targeted, site-specific input applications; and

4) Yield monitoring for recording crop productivity as an historical database for crop management

C. E-Commerce in Agriculture

Improved productions and high yields result in the need to look for profitable markets beyond local communities, and electronic markets are providing an opportunity to farmers to market and sell their produce to buyers at the global level. Electronic commerce, simply defined as the general exchange of goods and services via Internet, is already having a significant impact on agriculture. firms had already bought or sold agricultural products on the Internet and Goldman Sachs had estimated that 12% of all agricultural sales in the U.S. would be conducted over the Internet in 2004, compared to only 4% in 1999. Further, a study conducted by Rockwood Research on Internet use by profitable farmers in the US found that farmers were primarily using the Internet to access information on commodity prices, weather, farm chemicals, and machinery. The study also showed that farmers were migrating quickly toward Web-based transactions such as purchasing seed, crop chemicals, and farm equipment on the Internet.

ROLE OF ICT IN E–AGRICULTURE:

ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, mobile and fixed phones, computer and network hardware and software, satellite systems and so on, (as well as the various services and applications associated with them, such as videoconferencing, distance learning, etc) necessary for the delivery of information in the form of audio, data, video, image, etc from Point A to Point B. ICT consists of all technical means used to handle information and aid communication. Several reports underscore just how significant and extraordinary ICT productivity gains are not only for individuals and businesses, but for a nation. A new concept about Agricultural informatics that has arisen following the rapid development in information and communication technologies (ICTs) and of the internet. Referred to as e-agriculture, agricultural informatics is an emerging field which combines the advances in agricultural informatics, agricultural development and entrepreneurship to provide better

agricultural services, enhanced technology dissemination, and information delivery through the advances in ICT and the internet. The dissemination of information to farmers has become increasingly integrated into ICTs. Rural tele centres provide information on education, agricultural and health issues and equip rural citizens with skills on how to use computers and provide basic literacy. Also Radio and TV programmers feature agricultural information. Many of the organizations like government, private, cooperatives, and public have also attempted to facilitate technology transfer in the agricultural sector. Information and Communication Technologies (ICTs) are crucial in facilitating communication and access to information for agricultural and rural development.. Information and communication technologies are making tremendous impact on the rural economy due to its wide application and appeal. It may seem paradoxical that modem lets associated with developed country markets and capital intensive methods of production, has any relevance for country like India where many millions of people lack in basic needs. Nevertheless, there are many efforts in India and other developing countries to demonstrate the concrete benefits of ICT for rural population and to carry out the same in a manner that makes economic sense

Advantages of ICT in E-agriculture

1) It can initiate new agricultural and rural business such as e-commerce, real estate business for satellite offices, rural tourism, and virtual corporation of small-scale farms

2) It can support policy-making and evaluation on optimal farm production, disaster management, agro-environmental resource management etc., using tools such as geographic information systems (GIS).

3) It can improve farm management and farming technologies by efficient farm management, risk management, effective information or knowledge transfer etc., realizing competitive and sustainable farming with safe products

4) It can provide systems and tools to secure food traceability and reliability that has been an emerging issue concerning farm products since serious contamination such as chicken flu was detected.

5) It can facilitate rural activities and provide more comfortable and safe rural life with equivalent services to those in the urban areas, such as provision of distance

education, telemedicine, remote public services, remote entertainment etc.

6) Empowerment of Stakeholders (Government Officials, Research, Education & Extension Scientists, farmers and other service providers such as Community Information centers.

7) Development of Knowledge Management, Decision Support and Advisory Systems to strengthen Extension services and also used for Farmers Redressal system

8) Efficient management (Development, Conservation, allocation and utilization) of resources . 9) Improved productivity and profitability of farmers through better advisory systems.

FUTURE SCOPE:

1)E-agriculture is very helpful for the young farmer and provide them useful information‟ s regarding the plantations that they have grown.

2) E-agriculture scheme using the data mining technique namely birch clustering has been used for clustering the large datasets of farmers details .The present work on E-agriculture conveys the information regarding agricultural details to farmers in SMS via SMS gateway. The details such as daily alert, seasonal alert and other additional details can be sent to farmers.

3) Majority of farmers in the state or country are aware that mobile phones can be used to conduct businesses and receive information. Mobile phone costs should be lowered to enable majority of farmers for having access to the current information about agribusiness within the state or country.

4) The government should also conduct sensitization to create awareness for the farmers on how best they can use information technologies to conduct agribusiness.

CONCLUSION: The main intent of the agricultural e-commerce framework is to improve the agricultural sector in India. In a broad spectrum, two important factors are used as a base for developing the appropriate framework. Firstly, by focussing on Agriculture Production the total agricultural output can be increased by applying better farming practice, better seeds in market, more appropriate fertilizers for crops and understanding the dynamics of prices. All these parameters along with the timely intervention of ministry of Agriculture can help boost the agricultural

productivity of rural India. Secondly, structuring the marketing and sales will help in the marketing of agricultural products. A well maintained database will help track framer and trader information which can be used for trading purposes The present work on E-agriculture conveys the information regarding agricultural details to farmers in SMS via SMS gateway and hereby propose to switch over E-agriculture. The details such as daily alert, seasonal alert and other additional details can be sent to farmers. The daily alert can be sent to all farmers in the database. Seasonal alert can be sent to farmers only for selected farmers based on clustering result. Finally the other or additional detail which is announced by agriculture can be sent to all farmers. Experimental result shows better result when compare with the existing work. This paper also talks about Pros and cons of E-agriculture.

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