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# E-Agriculture: Concepts and Applications

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E-Agriculture is an emerging field which focus on the enhancement of agriculture and rural development through improved information and communication processes. It is sometimes referred as ICT in agriculture.

- E-agriculture is a relatively recent term in the field of agriculture and rural development practices.
- Global survey is carried out by the United Nations (FAO) in late 2006 for E-Agriculture.
- E-agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (ICT) in the rural domain, with a primary focus on agriculture.
- In 2008, the United Nations referred to E-Agriculture as "an emerging field"
- Many e-Agriculture interventions have been developed to help agriculturist improve their livelihoods through increased agricultural productivity and incomes and reduction in risks.
- The FAO-ITU E-agriculture strategy guide was developed by the food and agriculture organization (FAO) and the international telecommunication union (ICT) with support from partners including the technical centre for agriculture and rural co-operation (CTA) as a framework for countries in developing their national e-agriculture strategy.
- The FAO-ITU E-agriculture strategy guide provides a framework that address the ICT opportunities and challenges for the agricultural sector in a more efficient manner while generating new revenue system and improve the livelihoods of the rural community as well as ensure the goals of the national agriculture master plan are achieved.
- Some countries who are using the FAO-ITU e-agriculture strategy guide to develop their nation e-agriculture strategy are followed by Bhutan, Papua New Guinea, Philippines and Fiji, Venezuela, Nigeria, Kenya etc.
- The guide provided a framework to engage broader stake holders in the development of national e-agriculture strategy.

## Importance of Information Technology (IT) in agriculture

IT acts as a tool for direct contribution to agricultural productivity and as an indirect tool for empowering farmers to take informed and quality decisions which will have positive impact on the way agriculture and allied activities are conducted.

- The direct benefit of IT is made through precision farming
- The techniques of remote sensing using satellite technology, geographical information system and agronomy and soil science are used to increase agricultural output or productivity. This approach is capital intensive and useful where large tracts of land are involved

- The indirect benefits of IT in empowering farmer are significant and remain to be exploited. The farmer urgently requires timely and reliable sources of information inputs for taking decision.
- The main effects of IT (Information Technology) on agriculture are improved decision making, better planning, community involvement, agricultural breakthrough.

**Telephone-**Interactive voice response
**Computer and network-** Agri information and markets
**Broadcasting**-expertise sharing, advisory and community
**Satellite**-weather, universal accessibility, remote sensing
**Mobile**-advisors, banking, networking.
**Internet and broadband**-knowledge sharing, social media. banking, online marketing.
**Sensor network**-real time information and decision making
**Data storage and analytics**-precision agriculture, actionable knowledge

## AgriNet

Agriculture Network Information Centre is formed to providing internet access to quality, authoritative agriculture information, and specialized reference services. Here, we can use technologies like satellite remote sensing (SRS) which will help in mapping and monitoring features and processes on earth's surface while Geographical Information System (GIS) stores, retrieves, analyses, and displays spatial a non-spatial attribute data in a computer to support decision-making. Seamless integration of GIS, SRS, GPS etc. holds the key for effective utilization of spatial technologies to solve agriculture problems. Unlike most science and technology disciplines, agriculture has a mechanism for distilling and distributing research to those who need it.

**Objectives of AgriNet**

a. It can strengthen agriculture research and accelerate technology transfer through establishing regional network on agriculture and allied disciplines, particularly among agriculture research and extensions centres, professionals, policy advisors and stakeholders.
b. To provide inputs for developing regional policies, strategies and programmers, primarily through developing networks in the crop. livestock and fisheries sectors and for efficient utilization/management of soil, water and other resources.
c. To promote new and innovative techniques and systems in agriculture include production, post-harvest and food processing.
d. To facilitate collaborative studies on agriculture marketing and distribution systems, harmonization of agriculture related standards, promotion of agricultural trade. food security. and risk and disaster management agriculture.
e. To facilitate and undertake collaborative capacity building programmers in agriculture and allied sectors with focus on skill development and research in frontier areas.
f. To collate and disseminate information for agricultural advancement in the region.

## Advantages and Challenges in E-Agriculture

E-Agriculture focus on the enhancement of agricultural and rural development through improved information and communication processes. More specifically, e-Agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (IT) in the rural domain, with a primary focus on agriculture. Indian Agriculture contributes to 18.6 per cent of India's GDP, and approximately 59 per cent Indians derive their livelihood from the agricultural sector. Private sector initiatives like contract farming have commercialized the Indian agricultural sector. To enable community members to exchange opinions. experiences, good practices and resources related to e-Agriculture, and to ensure that the knowledge created is effectively shared and used worldwide. But there are some advantages and drawbacks which reside in every technology.

The main phases of the agriculture industry include crop cultivation, water management, fertilizer application pest management, harvesting, transfer of foods, safety.

quality management and marketing management. Any system applied for getting information and knowledge for making decisions in any industry should deliver accurate, complete, concise information in time. The information provided by the system must be in user-friendly form, easy to access, cost-effective and well protected from unauthorized accesses.

The development and implementation of precision agriculture or site-specific farming has been made possible by combining the Global Positioning System (GPS) and geographic information systems (GIS). These technologies enable the coupling of real-time data collection with accurate position information, leading to the efficient manipulation and analysis of large amounts of geospatial data. GPS-based applications in precision farming are being used for farm planning, field mapping, soil sampling, tractor guidance, crop scouting, variable rate applications, and yield mapping. GPS allows farmers to work during low visibility field conditions such as rain, dust, fog, and darkness.

In the past, it was difficult for farmers to correlate production techniques and crop yields with land variability. This limited their ability to develop the most effective soil/plant treatment strategies that could have enhanced their production. Today, more precise application of pesticides, herbicides, and fertilizers, and better control of the dispersion of those chemicals are possible through precision agriculture, thus reducing expenses, producing a higher yield, and creating a more environmentally friendly farm.

## E-Agriculture in Rural Development

The Food and Agriculture Organization (FAO) of the United Nations, in collaboration with the International Telecommunication Union, has come up with the e-agriculture strategy to help countries use information and communication technology to drive rural development. Primarily focusing on agriculture, information and communication technologies (ICTs) can help boost agricultural development by improving farmers' access to vital information so that they make the best decisions and use resources sustainably.