**Role of ICT in Extension and Rural Development**

**Information and communication technology in agriculture** (**ICT in agriculture**), also known as **e-agriculture**, focuses 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 (ICTs) in the rural domain, with a primary focus on agriculture.[[1]](https://en.wikipedia.org/wiki/Information_and_communications_technology_in_agriculture#cite_note-1) ICT includes devices, networks, mobiles, services and applications; these range from innovative Internet-era technologies and sensors to other pre-existing aids such as fixed telephones, televisions, radios and satellites. Provisions of standards, norms, methodologies, and tools as well as development of individual and institutional capacities, and policy support are all key components of e-agriculture.

Many ICT in agriculture or e-agriculture interventions have been developed and tested around the world to help agriculturists improve their livelihoods through increased agricultural productivity and income, or by reducting risks.

**Wireless Technologies**

[Wireless](https://en.wikipedia.org/wiki/Wireless) technologies have numerous applications in agriculture. One major usage is the simplification of [closed-circuit television](https://en.wikipedia.org/wiki/Closed-circuit_television) camera systems; the use of wireless communications eliminates the need for the installation of [coaxial cables](https://en.wikipedia.org/wiki/Coaxial_cable).

**GPS**

In agriculture, the use of the [Global Positioning System](https://en.wikipedia.org/wiki/Global_Positioning_System) provides benefits in [geo-fencing](https://en.wikipedia.org/wiki/Geofencing), [map-making](https://en.wikipedia.org/wiki/Map_making) and [surveying](https://en.wikipedia.org/wiki/Surveying). GPS receivers dropped in price over the years, making it more popular for civilian use. With the use of GPS, civilians can produce simple yet highly accurate digitized map without the help of a professional [cartographer](https://en.wikipedia.org/wiki/Cartographer).

In [Kenya](https://en.wikipedia.org/wiki/Kenya), for example, the solution to prevent an elephant bull from wandering into farms and destroying precious crops was to tag the elephant with a device that sends a text message when it crosses a geo-fence. Using the technology of [SMS](https://en.wikipedia.org/wiki/SMS) and GPS, the elephant can roam freely and the authorities are alerted whenever it is near the farm.

**GIS**

[Geographic information systems](https://en.wikipedia.org/wiki/Geographic_information_system), or [GiS](https://en.wikipedia.org/wiki/Geographic_information_system%22%20%5Co%20%22Geographic%20information%20system), are extensively used in agriculture, especially in [precision farming](https://en.wikipedia.org/wiki/Precision_agriculture). Land is mapped digitally, and pertinent geodetic data such as topography and contours are combined with other statistical data for easier analysis of the soil. GIS is used in decision making such as what to plant and where to plant using historical data and sampling.

**Automated Devices**

[Automatic milking](https://en.wikipedia.org/wiki/Automatic_milking) systems are computer controlled stand alone systems that milk the dairy cattle without human labor. The complete automation of the milking process is controlled by an [agricultural robot](https://en.wikipedia.org/wiki/Agricultural_robot), complex herd management software, and specialized computers. Automatic milking eliminates the farmer from the actual milking process, allowing for more time for supervision of the farm and the herd. Farmers can also improve herd management by using the data gathered by the computer. By analyzing the effect of various [animal feeds](https://en.wikipedia.org/wiki/Fodder) on milk yield, farmers may adjust accordingly to obtain optimal milk yields. Since the data is available down to individual level, each cow may be tracked and examined, and the farmer may be alerted when there are unusual changes that could mean sickness or injuries.

**Smartphone**

The use of mobile technologies as a tool of intervention in agriculture is becoming increasingly popular. Smartphone penetration enhances the multi-dimensional positive impact on sustainable poverty reduction and identify accessibility as the main challenge in harnessing the full potential in agricultural space. The reach of smartphone even in rural areas extended the ICT services beyond simple voice or text messages. Several smartphone apps are available for agriculture, horticulture, animal husbandry and farm machinery.

 **E-Commerce**

Online purchasing order of agri-inputs and agri-equipments is a subset of [E-commerce](https://en.wikipedia.org/wiki/E-commerce).