International Journal of Social Impact
ISSN: 2455-670X
Volume 10, Issue 1, DIP: 18.02.019/20251001
DOI: 10.25215/2455/1001019
www.ijsi.in |January- March, 2025

Article

Digital Technology: Revolutionize the Agriculture

Dr. (Ms.) Subhashree Panda[1]*

ABSTRACT

Peoples lives have been changed to a great extent over the past few decades due to technological changes and those who are working in the agricultural sector has been benefitted in a significant way by the effective use of technology. According to the Mackinsey report 2015, agriculture is the least digitized sector when compared with the health, construction and business. Farmers as well as various other actors in the agricultural sector requires adequate information for the day to day operation of the activities pertaining to crop, pesticides, irrigation, weather, soil and harvesting etc. In this context, Information and communication technology (ICT) plays a pivotal role for the exchange of knowledge regarding marketing of agricultural products, financial institutions for providing loans to the farmer, and providing agricultural related information to the farmers and the middleman in order to make the agriculture a profitable business. Digital agriculture (D-Agriculture) or ICT in agriculture is a common buzzword now-a days. Digital agriculture is the use of ICT and data system to support and development of information for the sustainable agriculture. The present paper is an attempt to examine the innovative use of ICT in agriculture.

Keywords: *Digital, Agriculture, Technology, Farmer*

Through digital technology, the world is connected. As the mobile becomes faster, cheaper and more efficient, many organizations are taking the advantage of the digital technology in order to solve the problems of their sector. Farmers are also no exception in this regard to solve their agriculture related problem such as precise use of water, and fertilizer. Digital technology not only ease the agricultural process but also farmers can take better decision in monitoring various tasks and performances, budgeting, and reporting. It can be used in agricultural farming, handling livestock, agronomy and communication etc.

Digital Technology: Concept

The term digital technology includes a wide range of tools, applications and devices. According to OECD (2014), digital technologies can be defined as "information and communication technology which includes internet, mobile technologies and devices, as well as data analytics. It is used to improve the generation, collection, exchange, aggregation, combination, analysis, access, searchability and presentation of digital content, including for the development of services and apps.

[1]Assistant Professor (Management), Parala Maharaja Engg. College, Sitalapalli, Berhampur
*Corresponding Author

Received: March 18, 2025; Revision Received: March 25, 2025; Accepted: March 30, 2025

Digital Platforms:
Digital platforms not only collate information but also providing opportunities for access and effective use of wide range of information and services. One of the salient features of digital platform is enabling both commercial and noncommercial transactions business. It may be taking place between Business to Business (B2B), business to consumers (B2C), and consumers to consumers (C2C).

Benefits of the Digitisation in Agriculture:
Digital technology helps in:

- Improving Crop yields.
- Reducing water, pesticide and use of fertilizer in crop cultivation.
- Reproductive efficiency in animal such as beef, pig, cow, buffalo and lamb. As a result, it leads to higher outputs in diary products and meat.
- Reducing the impact of the farming on the soil / environment. For example, lowering of fertilizers move to the water.
- Technology make the farming safe for the farmer.
- Digitization make the labour cost minimum with the precision of the work with less time leads to less cost of the agricultural products for the consumer.

Emerging digital technology in Agriculture:
In Ireland, various new and emerging technology bringing changes in agriculture. It includes basically use of biotechnology and bioengineering in farming, sensors for collecting the data, use of robotics and automation. The emerging technologies used in agriculture are as follows:

Sensors:
Sensor technologies are used in the agriculture. It is an electronic device which detects as well as measures the change in the physical environment such as temperature as well as the intensity of the light. It converted the measure into signals and send it to computer or mobile app. Mobile phone may have different types of sensors such as motion sensors, pressure sensors, light sensors, Global positioning systems (GPS) and many more.

Sensors: Global Positioning System (GPS) and Geographical Information System (GIS)
The main objective of using the technology in Global Positioning System (GPS) is to trace the position as well as the speed. Geographical Information System (GIS) is also used for monitoring crop growth. By using the GIS the farmer can decide the sowing rate, application of fertilizer, use of pesticides etc. in the different parts of the field. GPS can also be used in automated agriculture where the driverless machine are used for harvesting the crops. It can also be used for sampling of soil as well as farm planning. By using the GPS technology, the farmer can work in the field when intensity of the light is low during night or fog in the early morning.

Machinery Sensors:
Machinery sensors not only provide real time data to the farmers but also monitor performance of the tractor, prevents breakdown and improve safety. In harvesting equipment sensor can measure various properties such as sugar, protein, and starch where as in milking machines measure the milk yield, fat as well as non fat components of the milk of each cow which is helpful for the farmer.

Soil & Weather Sensors:
Farmers are benefitted by the soil sensor technology reading the soil conditions, soil fertility, temperature, water content, ph. Using this information farmer can effectively optimize the water, fertilizer and lime. Similarly, weather sensor measure the weather conditions such as rainfall, temperature, wind speed, and direction of the wind.

Drone Technology:
The high resolution images of the field, size of the plant, density and height of the crop, the amount of the water required and infestation of the weed or pest etc can be done by drone.

Big Data and Internet of Things (IOT):
Sensor generates huge amount of data and can stored in a concise way for the farmer for future need for the other farmers too. The data can be stored in cloud. Important information can be combined for various purposes e.g. pest and disease control. The internet of things (IOT) involves devices connected to the internet.

Biotechnology and Bioengineering:
The controlled as well as deliberate manipulation of the biological systems such as living cells or cell components is known as biotechnology. Biotechnology often use genetical engineering (Bioengineering) refers to alteration or manipulation of the genes within organisms. The genetically modified GM) crops have high resistance to few diseases or herbicides. In US GM crops are widely used. The bioengineering process can be applied for the animals to increase the milk, or milk with high proteins and fat levels, zero lactose or reduced methane output. In future synthetic or cultured meat may be available in the market.

Robotics and Automation:
Future farming will be largely depended upon the robotics, and self driving machinery for the harvesting of the crops, fertilization and managing animals. In Ireland automated milking machines are used and in European Union (EU) 50% of the milking machine installed are automated. The advantage of the robotics milking are: I) reduced labour cost, ii) increased frequency of milking (thrice a day), and effective management of the herd. Automated feeders are widely used in Ireland, in which milk amount has been automated automatically, pregnancy stage can be detected by biometric sensor.

Apps Used for Indian Agriculture:
n India, many people depends upon the agriculture as chief occupation. Not only it is the means of their livelihood but also contribute to gross domestic product (GDP). Low agricultural productivity in India is due to the lack of adequate facilities provided to the farmer. According to the Economic Survey Report 2017-18, total workforce in agricultural sector will drop to 25.7 percent in 2050 from 58.2 in 2001. Farm mechanization is the need of the hour. So, few start-ups are developing innovative method to help the farmer community through mobile app such as NaPanta, Mandi trades, Agriapp, Rainbow agri market.

Opportunities In Digital Agriculture:

- Mobile Payment System
- Micro-Insurance System
- Micro-Lending Platform
- Mobile Information Platform

- Farmer Helpline
- Inclusion in Academic Curriculum – e-Agrciulture programs in the academia

CONCLUSION

By 2050, human population is expected to reach ten billion and it will put pressure on farmers to produce more. Now-a-days semi-automatic vertical firms are widely used to save space, which reduce harvesting and transport costs. Digital agriculture can be effectively implemented only with the government support, formulation of various policy, farmers friendly rules and regulations, so that visibility of the digital agriculture can be not only useful for the farmers but also for the consumers.

REFERENCES

Bergvinson, David. "Digital Agriculture Empowers Farmers." *Business Today*, 26 Dec. 2016, www.businesstoday.in/magazine/features/digital-agriculture-empowers-farmers/ story/242966.html3. Accessed 1 May 2025.

Newman, Daniel. "Top Six Digital Transformation Trends in Agriculture." *Forbes*, 14 May 2018, www.forbes.com/sites/danielnewman/2018/05/14/top-six-digital-transformation-trends-in-agriculture/#16d38f1eed2e. Accessed 1 May 2025.

Singh, Nidhi. "#4 Apps That Are Changing the Face of Indian Agriculture." *Entrepreneur*, Entrepreneur Media India, 7 Feb. 2018, www.entrepreneur.com/article/308675. Accessed 1 May 2025.

Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Panda, S. (2025). Digital Technology: Revolutionize the Agriculture. *International Journal of Social Impact, 10*(1), 239-242. DIP: 18.02.019/20251001, DOI: 10.25215/2455/1001019