Chapter 14
Digitalization and Automation in Agriculture Industry

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ABSTRACT

The industrial production has experienced a technological revolution in the recent past decades. The technological revolution influenced the agriculture industry too. The important areas in the change are not limited to innovation in farming, novel production of agriculture-based tools and equipment, transportation and consumption of food across the globe, marketing the agriculture products, and digitalization. Digitalization is the involvement of digital technology in the existing field for easing the mechanism of handling, processing, recording the data. Digitalization enables sustainable farming. It is required desperately to develop this technology because there is a substantial reduction of clean water and depletion of aquifers effects the cultivation. With the technology, the quantity and quality of the food has to be managed to feed the global population. The familiar digitization technology that makes the agri-industrial sector to experience growth are artificial intelligence, machine learning, sensor networks, internet of things, robotics, cloud data.

INTRODUCTION

In India, Agriculture is the main occupation. More than 70% of the population is engaged with Agriculture. During pandemic, people ran behind the Food rather than other commodities. Thus, the well-known phrase "Food First" is being proved. Producing and consuming healthy food is the most important and primary need today. Also, food safety and security are equally important for the growing population.

In India, inadequacy of cultivating land and irrigating water restricts the quality and quantity of production of food crops. Digitalized farming could be one of the solutions for the challenges. This farming method involves digital technology as supporting system for the plant growth and yield (Giesler, 2018).
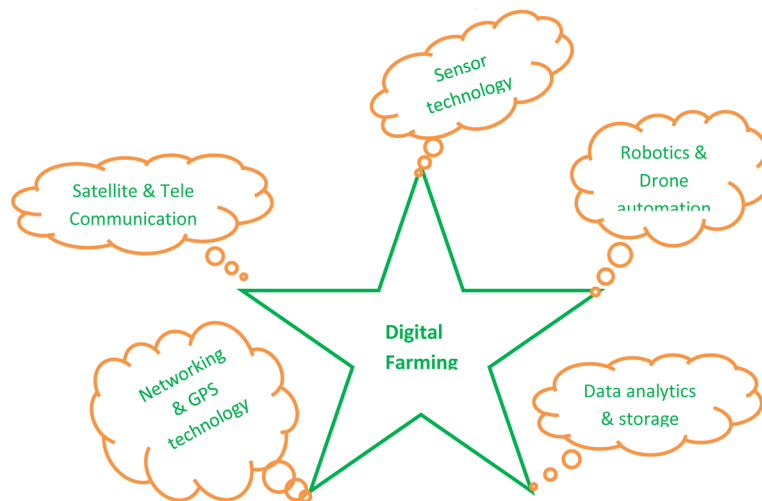
Digitalization of agriculture field is the development, adaptation of the information and communication technology in the field. This enables the human machine interaction. The tools of digitization are real-time monitoring and control through sensors, internet of Things, big-data, machine learning and cloud computing (Bramley & Ouzman, 2019).

In this chapter, the integration of traditional agriculture knowledge with the existing digital technology to improve the efficiency of high yield is being discussed.

Literature Review

Digital farming otherwise intelligent farming (Marcu, et.al., 2020) is a concept of utilizing the sophisticated telecommunication tools for soil and crop management. Management includes handling of available natural resources efficiently to meet the global demand of growing population and providing the right data at right time to right person (Saleem, et.al., 2018). Digital farming technique involves the sensor technology, Robotics & Drone automation, data analytics & storage, networking & GPS technology, Satellite & Tele Communication (Challa, et.al., 2017). It is illustrates in the figure 1

Figure 1. Illustration of Digital Farming

Digitalization in Agriculture

Digitalization make the job ease in all industry and supports for economic growth (Giesler, 2018). Digitalization of Agriculture can be called as fourth revolution for maximum sustainability of quality food (Carlos, 2019 ; Rose & Jason, 2018). In the field of Agriculture, the invention of machine for ploughing, sowing, weeding, and applying pesticide, monitoring the crop growth, crop health, harvesting, storing, packing and transportation of food helps the farmer to reduce their burden. Here, various sensors are

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