Chapter 1
IoT-Based Precision Agriculture System: A Review

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ABSTRACT

The huge number of items associated with web is known as the internet of things. It is associated with worldwide data consisting of various components and different types of gadgets, sensors, and software, and a large variety of other instruments. A large number of applications that are required in the field of agriculture should implement methods that should be realistic and reliable. Precision agriculture practices in farming are more efficient than traditional farming techniques. Precision farming simultaneously analyzes data along with generating it by the use of sensors. The application areas include tracking of farm vehicles, monitoring of the livestock, observation of field, and monitoring of storage. This type of system is already being accepted and adopted in many countries. The modern method of smart farming has started utilizing the IoT for better and faster yield of crops. This chapter gives a review of the various IoT techniques used in smart farming.

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INTRODUCTION

The basic source of livelihood in India is agriculture. Hence the survival of human species is based mainly on agriculture. The development of countries economy is dependent on it, as it is the most important source of food. Agriculture also provides ample opportunities of employment to the people. In present world farmers are still following the conventional methods of agriculture, the consequence is that there is low production of crops and fruits. This situation can be improved if we follow new techniques which utilize automatic machineries. As per the survey done so far there is no significant development in the agriculture sector. Due to decline in the crop rate food prices are continuously increasing. Due to this large number of people are pushed into poverty. Factors such as wastage of water, less fertile soil, inadequate supply of fertilizer, change in climatic condition, *etc*. At present it is essential for us to create solution for this problem by applying new techniques. The technologies such as IOT can make effective development in agriculture. What is the need of IoT in agriculture? (Rao and Sridhar, 2018). The survey of food and agriculture organizations-United Nations has given the data that around 70% growth in agricultural production is required till 2050 keeping in eye the evolving population. The increase in crop production can happen if the modern science and technology is applied. By the use of IoT, there can be increase in production along with efficient monitoring of soil at a minimum cost, monitoring of temperature and humidity, monitoring of rain fall, checking of efficiency of soil, water tank storage capacity monitoring and also detection of rate of theft. Modernization of agriculture can be done by combining the traditional methods with technologies such as IoT.

A three tier system is involved in internet of things (Patil and Kale, 2016). The three layers are perception, network and application. The main component present in the first layer are sensor motes which are the devices enabled with Information Communication Technology(ICT).The main building blocks of sensor technology are the sensor motes. The components included in it are RFID tags, sensor network recognizable objects and sensor objects which are able to collect real time information. The IoT infrastructure which realizes the universal space is the network layer. Then comes the two other layers which are the combination of application layer and perception layer. Any specific industry can be combined with IoT through the application layer. Different areas of industry which includes smart agriculture, smart parking, smart building environment monitoring, transportation and healthcare. Agriculture

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