

INFLUENCE OF IoT IN AGRICULTURE

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ABSTRACT: *We are in the world of internet where we use more technology for the development, so called as developing nation. We use more technical fields for the development of various fields. Nowadays, technology is even used in the field of agriculture for more production, due to the inefficient rainfall, drastic change of the environment and also due to the spreading of unknown diseases. Internet of Things(IoT) plays a major role in smart agriculture as managing the crops, resources, cost, quality and quantity of production and so on. In this we are aiming to give the details of the farming methods and its maintenance methods using the wireless communication method.*

KEYWORDS: IoT, Smart farming, Applications, Sensors.

1.INTRODUCTION:

IoT has developed many techniques in the field of agriculture. The current stats state that about 9.6 billion population may reach by 2050. IoT helps the technologists for the creating the new ideas that helps the humans in many ways. Not only humans but also for the nature, many people make IoT in the field of agriculture which makes the major changes and improvement in that particular field. This massive increment of population and to feed this population we adopt the technology known as IoT, despite of these problems it helps to overcome the climatic and weather conditions, impacts of environment based on the situation. This helps us from scarcity of food. Due to the over usage of water, we are facing the water scarcity, which results in the drought where the farmers are not able to cultivate the crops. This results in the hybrid variety of crops. These are all eradicated using IoT technology. Smart Farming is totally different from traditional farming. In traditional farming, we use old and ancient methods for farming which takes more days and also only seasonal crops based on the demands. But in smart farming we are connected with smart devices, internet, IoT sensors, which helps to select the conditions for plant growth, nutrient to be provided to the crop, quality of soil and water. It helps in the high production of crops and less cost effective and low labour work and easy to cultivate. Figure.1 plays a major role is listed below.

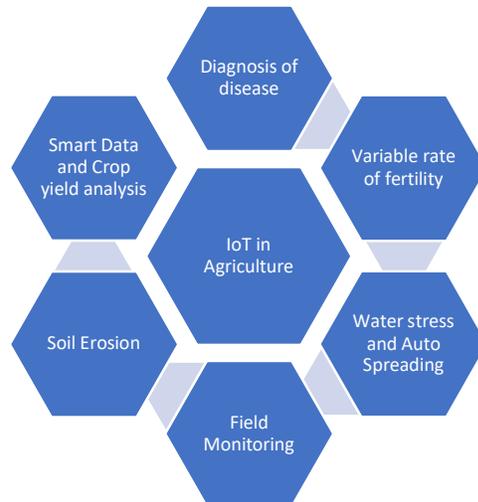


Figure.1 Internet of Things in Farming

2.RELATED WORKS:

Puranik, V @ all described about the Smart agriculture works. They have given the basic details of the agricultural works that have been used in the fields through IoT. They have also helped to make the agricultural field develop with the technical works[1]. Namani, S., &Gonen, Ball described about the agricultural works of IoT devices. They have given introduction to the technical devices and methods for the better use of them in the agricultural fields[4]. Marcu, @ all described that the IoT devices used in the agricultural fields. They have also said about the sensors that are used in the agricultural fields[9]. Mat, I., MohdKassim, M. R., Harun, A. N., &Yusoff, I. M all described about the effective use of the Smart farming techniques. They have explained about the use and financial support required for the smart farming[8]. Chaudhary, S. @ all gave the concept of farming using IoT sensors. It gives the review of the smart agricultural fielding. The sensors efficiency and its uses are explained clearly[5]. Farooq, M. S., @ all described about the implementation of agricultural works with IoT. Those implementations were successfully implemented.[6]. Rahul Dagar, @ all describes the proceeding techniques for the agricultural IoT. It also explains the applications and techniques of the IoT sensors[3].

3. MATERIALS AND METHODS:

3.1SMART FARMING:

Smart Farming is a technique which has high investment and modern machines for the production of crops and reliable of the masses. The farms are using Modern Information and Communication Technology (ICT) for the better production of crops with best quality and quantity while the help of human is less needed. Smart farming is used to monitor the growth of crops through the sensors (humid, Temp, Light, Soil, etc.,) and the automatic irrigation methods is executed. The farmer can overview the agricultural lands in the smart device without coming to the land. In this methods , we can avoid using the pesticides, insecticides which not only damage the insects or pests but also the quality of the crop being produced. In short,

“Smart Farming increases the crop productivity and reduces the wastes.”

Requirements for adopting Smart Farming :The initial Investments are high for the setting up of drones, sensors etc.Appointing a trained staff for the maintenance and operating the field

works. Power connection to charge the drones. Maintenance of hardware. Persistent connection of internet. This faces major environmental issues like climatic changes, water efficiency and so on. It can be cleared using the influence of IoT.

3.2 PRECISION FARMING :

Precision Farming is to manage the accuracy of the field in growing the crops and regulating them in proper manner with the less amount of resources and cost. It helps in maintain the livestock, vehicles, laboratory works etc. Precision means accurate hence this type of farming helps in the accurate production of crops. In the livestock area, it collects the data of the livestock, and maintains that. i.e., it has the information about the livestock like it's health conditions, well-being, locations and the maintenance cost etc., In vehicle tracing it maintains the total amount of load has been loaded (exported) from the land and its travelling location, maintenance etc., is maintained. Moreover this farming is also known as Precision Agriculture. Figure.2 represents the Technique of precision farming .

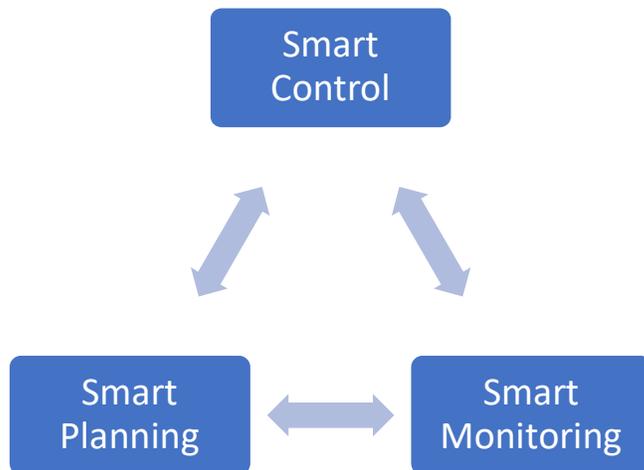


Figure.2 Precision Farming

3.3 DRONES:

Nowadays, drones are used to monitor the crop growth through the sensors like thermostat where the crop needs are identified depending on their growth. Even the spraying the water, insecticides are all done through drones which make less cost. Any changes in the crop alerts the sensors and it is notified. The survey of the land is made through drones by mapping and imaging the land. Through the drones, we can collect data about the water passage, measuring the plant height, yields, measurement of chlorophyll content in the plants, nitrogen content in the crops especially in wheat. It also takes in the imaging in the form of thermal, visual and spectral view of the land.

3.4 CLIMATE CHANGES :

In farming, the climatic conditions plays a major role. The IoT devices helps to trace the climatic conditions and according to that climate the crops are cultivated. They use sensors to detect the climatic conditions. The sensors are incorporated both inside and outside the agricultural fields. In case of any emergency the alert signal is send. Those sensors collect data's to detect the real-time conditions of the climate like temperature, dew, rain, etc., They help to choose the right crop at the

right time and produce the drastic growth which helps the farmers to lead their lives. The sensors monitor the crop growth, climatic conditions and weather surrounding the land. The physical presence of the farmers during the emergency situation makes the crop productivity increase and produce more yield.

3.5 GREEN HOUSE:

In order to make the greenhouse smart, the IoT has made the climate control room(weather station) which can adjust automatically to the climate. This green house is done without the human help and it produces the large quantity of crops with the quality and with less cost effective and produce at the same duration. Climate detection sensors are used here. The sensors monitors the climatic conditions and greenhouse state and also collects the data's very precisely. The sensors monitors the water consumption of the plant. It also helps in the control of the pressure, temp, etc., These sensors send the data's message through the mail or SMS. Figure.3 represents the techniques used in smart greenhouse

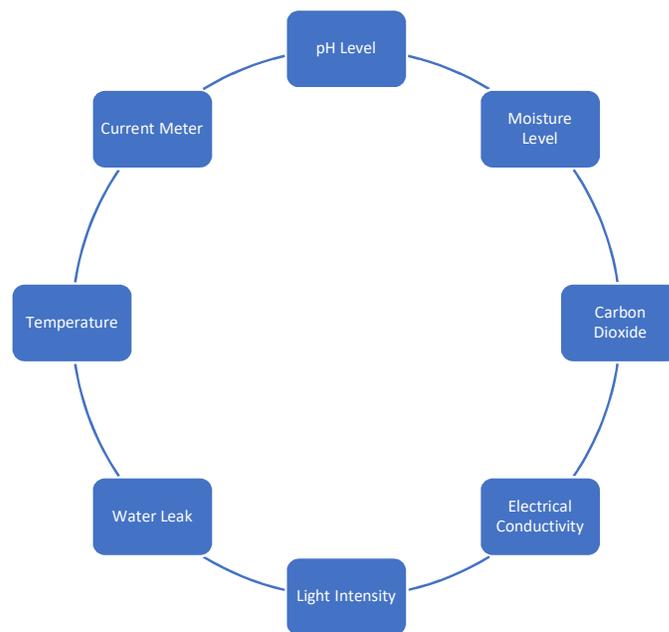


Figure.3 Techniques of smart GreenHouse

3.6 ANALYTICS OF DATA:

The standard database system do not have enough storage for the data's to be stored that were collected from the sensors. So the IoT uses the Cloud or end-to-end IoT platform for the storage of data's. The sensors play a major role in the collection of data for the large scale industries. The

Analytics tools is used to transform information and data into a meaningful tool. The data analytics has the information about the livestock, crop and weather conditions. IoT helps the farmers to produce a quality crop and to maintain the fertility of the land without the use of chemicals. The data collected from the sensors are used to classify the crops and to identify the weather conditions and to take necessary measurements according to it. Hence, the IoT has a major role in the Agriculture fields for the production of the crops. Figure.4 represents the steps of data analytics.

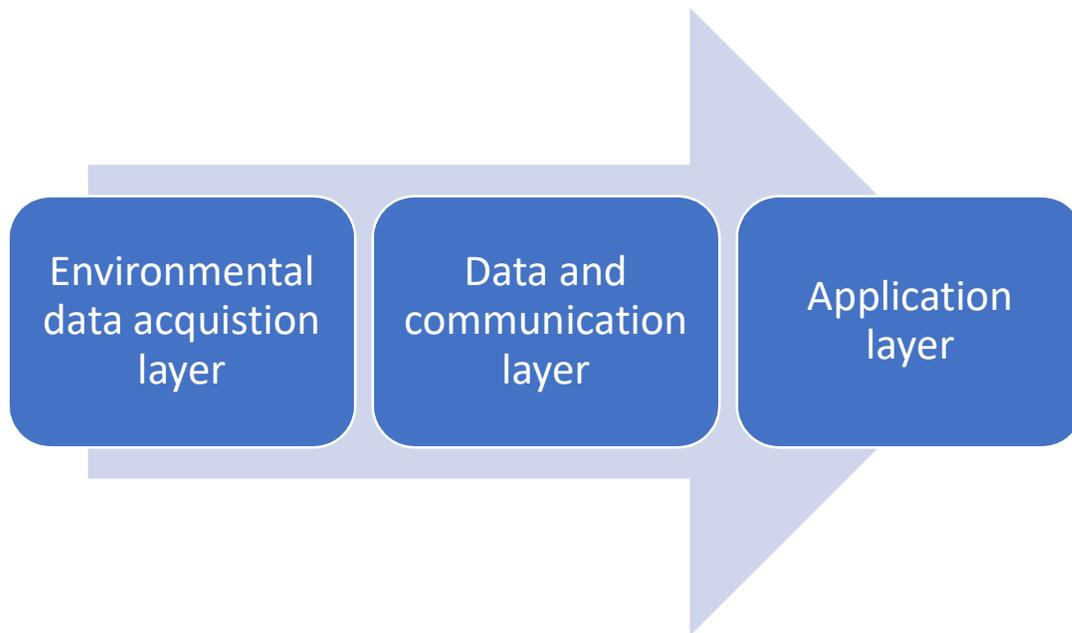


Figure.4 Steps of Data Analytics

4.DISCUSSION :

In this paper, I have given the review about the influence of IoT as well as it's devices in the field of agriculture. The agriculture is getting worse due to the bad climatic conditions and the chemicals from the nearby industries affected the fields, which is resulted in the loss of fertility of the soil. This says that the soil has lost its nature to produce the crops. So, with the help of the technology (IoT), the agriculture is getting enhanced. This results in the betterment of crop yields with the better quality and quantity without the use of chemicals, more yielding and also supports financially. The technology has proved that not only in the field of medical, science it helps but also in the field of agriculture. So that reason, nowadays in engineering a separate degree (Agricultural Engineering) is included.

5.CONCLUSION :

Farming has a major role in the economic growth of the nation and future of the nation depends upon the agriculture. Proverb says that "***Agriculture is the backbone of the nation***". In this paper, it hasdiscussed about the easy way to produce crops without the high investment. Only with the ideas and the internet we are able to do the agriculture with the help of IoT devices. It is helpful for the lands which can be more fertile in their production without usingthe chemicals. Therefore, we get the good quality of crops. IoT helps in many fields but it's impact has been delivered to the agriculture in the peak. The farmers gets their cost required according to their hard work without any loss. This makes both the consumers as well as the farmers happy.

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