Agri Articles
(e-Magazine for Agricultural Articles)
Volume: 02, Issue: 02 (MAR-APR, 2022)
Available online at http://www.agriarticles.com
©Agri Articles, ISSN: 2582-9882

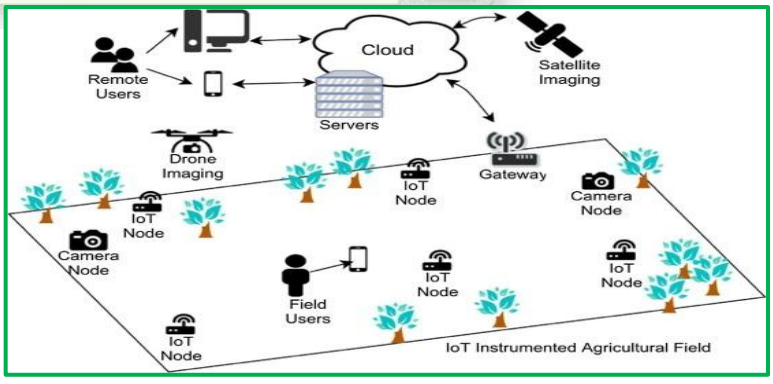
Significance and Future of IOT's in Agriculture

(*Lekha Kalra and Trilok Singh)
Ph.D., Agricultural Economics, Institute of Agricultural Sciences, BHU, Varanasi
* kalralekha135@gmail.com

Agriculture is considered as an important pillar of economy. Still in India, considerable number of people are engaged in this field directly or indirectly. Food is the basic necessity of every organism and agriculture and its subsidiary branches are playing a significant role in fulfilling these requirements. According to a well-known theory of economist Sir Thomas Malthus, "Population growth is potentially exponential while the growth of food supply or other resources is linear". Henceforth, more potential in the agriculture field need to be determined as well as productivity of crops need to be increased along with taking care of the environment. With the passage of time demand and supply gap is expanding. During 1990-1991, net area sown was 143.00 million hectare which reduced to 140.13 million hectare in 2014-15. According to FAO projection world will need to produce 70 per cent of more food in 2050. Considering this major issue in mind, Internet of Things (IOT's) has proven to lend a helping hand to farmers for increasing their crop productivity in an economical manner. It is a method of smart farming which connects different devices with internet and forms a network and at the same time is cost effective even for small and marginal farmers. It is effectively transforming the conventional form of agriculture to modern agriculture. IOT's consists of sensors which are connected to a cloud via cellular satellite network, this technology used in IOT's will be able to give live data on various parameters like soil moisture, light, temperature, rainfall, etc. from the field directly to the farmer by notifying him through the application installed in their phones and accordingly farmers will be able to take the necessary measures without much consumption of time and energy.

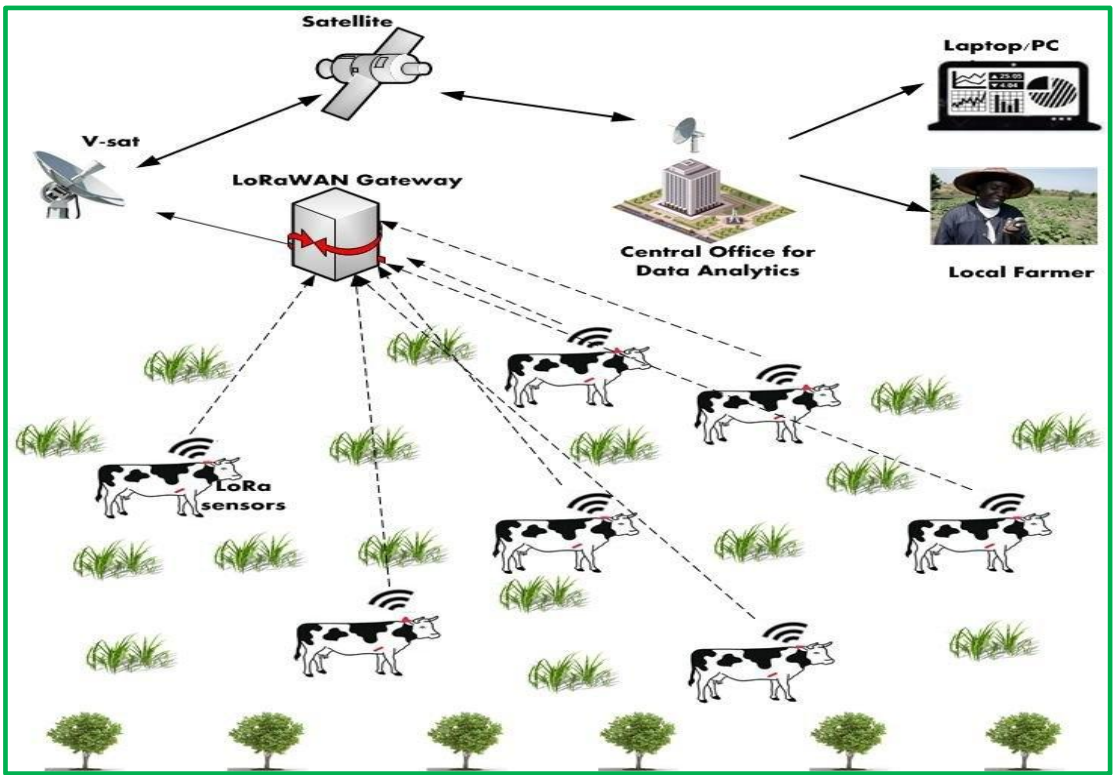
Various applications of IOT's in agriculture are given below;

Precision farming: - Also known as precision agriculture in which major decisions are taken with the help of latest technology and data such as sensors, GI, GPS, etc., which will bring accuracy in everything what farmers will do. For instance, tractors are fitted with sensors will till the land till the exact depth for a particular crop. With the help of precision farming, inputs cost can be reduced by 18-20 per cent. It is also helpful in measuring soil depth, soil temperature, soil temperature, etc.



Agriculture drones: - Two types of drones are used in agriculture for development which are ground base drones and ariel based drones which are used in the assessment of crop health, analysing the fields, spraying of pesticides, irrigation, etc. Data can also be collected with the help of drones on parameters like plant height, yield prediction, canopy cover, plant counting, nitrogen content in wheat, drainage mapping, etc., which will timely aware the farmers.

Livestock monitoring: - Farmers can easily track the location and health of their cattle with wireless IOT applications. Sick animals can be easily identified by the data provided by the IOT and separated from the herd and by this other animals can be prevented from getting infected by the disease. Sensors fitted in the cattle is also useful for cutting labour costs as owners can easily locate them with the help of these IOT's.



Smart greenhouses: - Conventional greenhouses need manpower to maintain the internal environment which increases the time, cost and inefficiency. Therefore, a smart greenhouse which intellectually control the climate and internal environment without any manual intervention. Different sensors are fitted in smart greenhouses which regulate internal temperature, moisture, air, light, etc. These sensors monitor each and everything from light turning and window opening to temperature controlling and cooling down with e help of an internet signal.

Therefore, smart or precision farming will enable the farmers in reducing the wastage and will increase the productivity from increasing the utilization of fertilizer in the soil to the efficient utilization of the scare resources which are left unused. Further with the help of IOT's farms can be controlled from any location, there will be less consumption of water and energy which will also reduce the operational costs. As well as quality of the food will be

increased because of low chemical application. This will ultimately help to minimize health issues.

Conclusion

Internet of Things (IOT's) has proven to lend a helping hand to farmers for increasing their crop productivity in an economical manner. It is a method of smart farming which connects different devices with internet and forms a network and at the same time is cost effective even for small and marginal farmers. It is effectively transforming the conventional form of agriculture to modern agriculture. IOT's consists of sensors which are connected to a cloud via cellular satellite network, this technology used in IOT's will be able to give live data on various parameters like soil moisture, light, temperature, rainfall, etc. from the field directly to the farmer by notifying him through the application installed in their phones and accordingly farmers will be able to take the necessary measures without much consumption of time and energy.

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