



ORIGINAL RESEARCH PAPER

Engineering

APPLICATIONS OF IOT IN SMART FARMING

KEY WORDS: Agriculture, IOT, GDP, Smart Farming

Dr. Rajeev B. Kharat

Director, WKBSM's Dr. Suryakanta R. Ajmera MCA College for Women, Dhule.

ABSTRACT *Indian GDP is majorly influenced by agriculture sector. It approximately counts 75% in the process. There has been lot of changes globally in the field of technology which is also impacting the Indian performance in the agriculture field. The applications of IOT are available in the field like water management, yield production, whether management, etc. The advantages of IOT tools in Agriculture sector is increasing as smart farming in the process of yield such as real time whether system, humidity prediction and appropriate management of water. The present paper is focuses the different aspects of IOT and respective uses in the agriculture sector.*

INTRODUCTION:

The majority of the population in Indian country is at ruler level. As per the Provisional Population Totals of Census 2011, the total population of India was 1210.2 million. Of this, the rural population stands at 833.1 million and the urban population 377.1 million. The Gross Domestic Product has decreased to 20% and contribution of other sectors increased at better rate as compare to agriculture sector. Hence, it is very crucial stage to agriculture sector to trace the root level problems and provide the better mechanism to achieve significant level.

The Indian farming style is still in routine basis. But to compete and increase the yield production there is a need of using new trends and technologies in farming. There are IOT(Internet of Things) several applications in farming may be useful for collection of temperature, precipitation, humidity, weather conditions, pest invasion, soil moisture content, etc. IOT is one of the leading standards are being used in the field of agriculture to get the maximum benefits.

What is IOT?

IoT (Internet of Things) is an advanced analytical system which includes the use of computers, laptops, smart phones, network, internet, artificial intelligence technology to enhance your services with transparency, accuracy, user friendliness, control and monitoring for data analytics and decision making process. It can be deployed in different types of sectors.

IoT Applications in Agriculture

- 1) Precision Farming: is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops. The goal of precision agriculture research is to define a decision support system (DSS) for whole farm management with the goal of optimizing returns on inputs while preserving resources.
- 2) Agricultural Drones: An agricultural drone is an unmanned aerial vehicle used in agriculture operations mostly in yield optimization and in monitoring crop growth and crop production.
- 3) Smart Greenhouses: A *smart greenhouse* brings conventional agricultural systems and new IoT technologies together for complete visibility and automation.
- 4) Climate Conditions: Using IOTs for getting the updations of climate conditions.
- 5) Remote Sensing: Remote sensing gives the soil moisture data and helps in determining the quantity of moisture in the soil and hence the type of crop that can be grown in the soil.
- 6) Crop Monitoring: IOT allows devices across a farm to

measure all kinds of data remotely and provide this information to the farmer in real time. IOT devices can gather information like soil moisture, chemical application, dam levels and livestock health - as well as monitor fences vehicles and weather.

7) Soil quality: Soil Monitoring with IoT uses technology to empower farmers and producers to maximize yield, reduce disease and optimize resources. IoT sensors can measure soil temperature, NPK, volumetric water content, photosynthetic radiation, soil water potential and soil oxygen levels.

What is Smart Farming?

Smart farming is the concept related to agriculture industry where the use of IOT (Internet of Things) is used for tracking, monitoring, automating operations and keeping watch on each and every moment of the farming.

Smart farming technologies like sensors, computes, laptop, telecommunications, GPS (Global Positioning System), Data Analytics, Satellite communication, remote sensing, image processing, etc.

Major Challenges for Smart Farming

- 1) It includes high investment and appropriate training.
- 2) Connectivity to power to charge and operate the drones and robots.
- 3) Hardware maintenance costs.
- 4) Continuous connectivity to the internet.

Key points for Smart Farming

- 1) Requires Skill based workers.
- 2) Difficulty in adopting new technologies for real time implementation.
- 3) Continues monitoring and maintenance is required to perform these operations.
- 4) IOT tools are costly.
- 5) Maintenance cost of these devices is also high.
- 6) Upgradations to these technologies are required time to time.

CONCLUSION

Agriculture is a backbone of the Indian Economy. Smart farming is a new trend with the use of IOT likely to improve the performance of the yield production, crop management, water management, soil analysis, fertilizer, etc. But at the same time it requires proper training to the farmers for implementations of these tools and technologies in the farming process. To implement IOT tools, it requires expenditures to be done on these equipments hence it may not be possible to all the farmers to use these trends. Smart farming can provide the benefits to the farmer as well as in the GDP of the country.

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