**LITERATURE SURVEY**

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| **S.N0** | **TITLE** | **AUTHOR** | **YEAR**  **&**  **PUBLICATIONS** | **METHODOLOGY** | **ADVANTAGE** | **DRAWBACK** |
| **1** | A Low-Cost Platform for Environmental Smart Farming Monitoring System Based on IoT and UAVs | Faris A. Almalki , Ben Othman Soufiene ,Saeed H. Alsamhi and Hedi Sakli | Multidisciplinary Digital Publishing Institute,2021 | \*A low-cost platform for environmental parameter monitoring using UAV–IoT for smart farming.  \*IoT devices can collect environmental data.  \* The data are sent to a gateway that is attached to a UAV and then transmitted to a cloud server.  \*Optimized propagation path loss is considered.  \*This platform is deployed and tested in a real scenario on a farm in Medenine, Tunisia | This low-cost platform can help farmers, governmental, or manufacturers to predict environmental conditions data over the geographically large farm field, which leads to enhancement of crop productivity and farm management in a cost-effective and timely manner. | \*Power consumption of the drone should be optimized to enhance flight time.  \*Considering machine learningapproach would enhance actions to be taken autonomously |
| **2** | LoRaFarM : LoRaWAN-Based Smart Farming Modular IoT Architecture | Gaia Codelippi,Antonio Cilfone, Luca Davoli and Gianluigi Ferrari. | Multidisciplinary Digital Publishing Institute,2020 | \*LoRaFarM aimed at supporting the management of an arbitrary farm through the integration of heterogeneous IoT technologies.  \* Based on the LoRaWAN architecture.  \* Has been evaluated in a real farm in Italy. | \*Collected environmental data(air/soil temperature and humidity) related to the growth of farm products over a period of three months.  \*Web-based dashboard is also presented, to validate the LoRaFarM architecture | \*Cost of system  \* Power consumption |
| **3** | Advanced UAV-WSN system for Intelligent Monitoring in Precision Agriculture | Dan Popescu , Florin Stoican , Grigore Stamatescu , Loretta Ichim and Cristian Dragana | Multidisciplinary Digital Publishing Institute,2020 | \*The measurements are collected at the ground level by the local nodes.  \*A UAV must pass above the Cluster heads to extract the relevant data from that area.  \* The UAV sends the data to a central unit forback-end cloud computing processing decision. | \*Intelligent data collection and processing.  \* Data Management and Interpretation level | \*Intelligent data collection and processing.  \* Data Management and Interpretation level |
| **4** | Design & Implementation of Innovative IoT  Based Smart Agriculture Management System For Efficient Crop Growth. | Korada Ratnakumari, Surapaneni Koteswari | Journal of Engineering Sciences,2020 | \*The system is capable of monitoring temperature, humidity, soil moisture level using NodeMCU.  \*A notification in the form of SMS will be sent to the farmer’s phone about the environmental condition of the field. | \*Monitoring temperature,humidity, soil moisture level  \*A notification in the form of SMS will be sent to farmer’s phone | \*Communication covering  \* Power consumption increases with communication range |
| **5** | Internet of things for smart farming and frost intelligent control in greenhouses | Alejandro Castañeda-Miranda (Dr.), Victor M. Castaño-Meneses (Dr.) | Elsevier,2020 | \*An intelligent antifrost irrigation management system is presented.  \*The system is self-sustaining using solar panels.  \*The ANN could be used to optimally predict the inside temperature of greenhouses.  \*FES controls the activation of a water pump | \*Intelligent control with Weather Station and Artificial Neural Network.  \*The fuzzy control and ANN allow the prediction of the internal temperature of the greenhouse. | \*Solar cell system is generally irregular and extensively influenced by the weather changes |
| **6** | A Low-Cost Wireless Mesh-based Smart Irrigation System | Nestor Michael Tiglao, Melchizedek Alipio, Jezy Verence Balanay, Eunice  Saldivar, Jean Louise Tiston. | Elsevier,2020 | \*An application for water irrigation called  Agrinex.  \*This application is connected to several in-field sensors such as a water level sensor, temperature sensor, and a field weather station.  \*The drip irrigation mechanism was utilized for feasibility reasons as water conserved was adequately measured. | Agrinex system features a mesh-like configuration of in-field nodes that act both as the sensor for soil moisture, temperature, and humidity and actuator on a valve that regulates drip irrigation. | \*High power consumption in the case of the sensor nodes far from Sink. |
| **7** | Genetic Algorithm based Internet of Precision Agricultural Things (IopaT) for Agriculture 4.0 | Sayan Kumar Roy, Debashis De. | Elsevier,2020 | \*Propose a system that will recommend whether water is needed or not by predicting the rainfall using a Genetic Algorithm.  \*If the moisture level of the soil crosses the predefined threshold value, then plant watering is performed by quadrotor UAV | A system that will recommend whether water is needed or not by predicting the rainfall using Genetic Algorithm | Gateway consumes more power because it is always awake. |
| **8** | A Framework for Agricultural Pest and Disease Monitoring based on Internet-of-Things and Unmanned Aerial Vehicles | Demin Gao, Quan Sun, Bin Hu and Shuo Zhang | Multidisciplinary Digital Publishing Institute,2020 | \*Framework for Agricultural Pest and Disease Monitoring Based on Internet of Things and UAV for providing profound insights into the specific relationship between the occurrence of pests/diseases and weather parameters.  \*The images captured by UAV are transmitted to the cloud for analyzing the degree of damage of pests and diseases based on spectrum analysis technology | The results demonstrate that wheat is susceptible to disease when the temperature is between 14 C and 16 C, and high rainfall decreases the spread of wheat powdery  mildew. | \*Power consumption of drone  \* Solar cell weight and size may restrict flight endurance |
| **9** | Smart agriculture with internet of things in cornfields | Murtaza Cicio glu a, Ali Calhan | Elsevier,2020 | \*Heterogeneous IoT sensor nodes system to sense acoustic, rain, wind, light, temperature,and pH levels of the cornfields.  \*The system aims to achieve productive corn harvest in large-scale fields using a drone that gathers data and sends it to a gateway.  \*Simulation results offer maximum efficiency of soil, reduction workload, and disease and pest risk; besides optimizing irrigation, which all lead to better quality products at low cost | The system uses heterogeneous sensor nodes which are capable of sensing acoustic, rain, wind, light, temperature, and pH levels. | \*Communication covering  \*Power consumption increases with communication range. |
| **10** | Smart Farming : IoT-Based Water Managing System | Anupama H S, Durga Bhavani A, Afra Zayab Fayaz, Allen Benny | International ajournal of Innovative Technology and Exploring Engineering(IJITEE),2020 | \* If the soil moisture goes below the threshold value thet indicates that the water is required for the plants. Hence,the pump automatically water the plants.  \* Soil moisture detector is connected to a power supply and Arduino UNO board.  \* The WiFi module is connected to the board and coupled with the laptop, which is used to give the appropriate instructions.  \* A LCD display is connected to all these components so as to display the required information about the overall status of the farm.  \* All the components are given commands through the WiFi module. | \*This will help the farmers to reserve the water for later use.  \*Sensors are used to detect the water level.  \* Proper planning & necessary machines which is of low cost has to be used. | \* It is used only for small farms because sensors whatever is been used will detect the moisture level for certain area |
| **11** | Smart farming using IoT, a solution for optimally monitoring farming conditions | Jash Doshi, Tirthkumar Patel, Santosh Kumar Bharti | Elsevier,2019 | \* The device monitors the farm or greenhouse and based upon the readings of different kind of sensors like temperature, humidity, soil moisture,UV,IR, soil nutrients and give different types of messages to the farmer about the present conditions so that the farmer can take quick action. | \* Remote monitoring for farmers.  \* Water & other natural resource conservation.  \* Good management also aiiows improved livestock farming.  \* Good quality as well as improved quantity. | \*The smart agriculture need availability on internet continuously rural part of developing countries did not fulfil this requirement  \*Fault sensors or data processing engines can cause faulty decisions which may lead to over use of water, fertilizers & otherw wastage of resources.  \*Smart farming based equipment require farmer to understand and learn the use of technology |