

IOT BASED SMART CROP PROTECTION SYSTEM ON AGRICULTURE.

ABSTRACT:-

Agriculture is the backbone of the economy but because of animal interface in agricultural lands, there will be huge loss of crops. This paper monitor and protection procedure for farm safety against animal attacks. It is proposed to develop a smart agriculture system that makes use of technologies such as ARDUINO, IOT and WSN. The feature of this paper incudes development of a system which can monitor temperature, humidity, water level and even the movement of animals through SENSORS using ARDUINO board. In case of any obstacle detected sends a notification to the application developed for the same to the farmer's smartphone using Wi-Fi. Hence, every time farmer will get to know the changes his farm. This project will be more helpful for the farmer's welfare.

KEYWORDS:-

IOT, SENSORS, Wi-Fi module, GSM module, SOLAR PANEL, MICROCONTROLLER.

INTRODUCTION:-

Crops in the farms are many times devastated by local animals like buffaloes, cows, goats, birds etc., This leads to huge losses for the farmer. This results in shortage of food. So, we have designed this project only for the secure from animals but this have the provision to secure from the human beings. The Smart Crop Protection System work on the battery so that this project can be easily portable and also, we add SOLAR PANEL and CONVERTER MODULE. This can help the battery to charge from solar energy. The sensors i.e. Tilt, flame, soil moisturizer sensor, temperature sensor, humidity sensor and IR sensors are deployed in each section will keep updating the parameter reading through a Wi-Fi communication module. This is effective and reliable system in agriculture monitoring. The IOT device is used to indicate the farmer by a message while someone enter into the form and we used SD card module that helps to store a specified sound to fear the animals.

LITERATURE SURVEY:-

One of the major economic issues faced by the country is agriculture as this the sector which is source of livelihood for about 54% of Indians till date. Still today this sector is not developed and faces lots of problems resulting into low productivity of crops. As 43% of land in India is used for farming but contributes only 18% of the nation's GDP. The poor condition of agriculture in the country is the point of concern for Indians. The rural farmers in India suffer from poverty and most of them are illiterate so there is lack of extension services. The problem of wild life attack on crops i.e. crop vandalization is becoming very common in the states of Tamil Nadu, Himachal Pradesh, Punjab, Haryana, Kerala...Wild animals like elephants, deer, bison, nilgais, estray animals like cows and buffaloes and even birds like parakeets cause a lot of damage to crops by running over them, eating and completely vandalizing them. This can lead to poor yield of crops and significant financial loss to the owners of the farmland. Another major problem faced by Indian farmer is the dependency on nature and poorly maintained irrigation system. Current agricultural practise neither economically nor environmentally sustainable and India's yields for many agricultural commodities are low.

The low productivity in India is a result of the following factor:-

- According to World Bank's "India: Priorities for Agriculture and Rural Development", India's agricultural subsidies are hampering productivity enhancing investment. Over regulation of agriculture has increased costs, price risks and uncertainty. India has inadequate infrastructure and services. World bank also says that the allocation of water is insufficient, unsustainable is deteriorating.
- Illiteracy, general socio-economic backwardness, slow progress in implementing land reforms and inadequate or inefficient finance and marketing services for farm produce.
- Very small (less than 20,000 square meter) size of land holidays due to fragmentation, land ceiling acts and family disputes.
- Such small holdings are often over-manned, resulting in disguised unemployment and low productivity of labour.

- Illiteracy of farmers and their ignorance in the field of modern agricultural practices and technology, hampered by high costs and impracticality in the case of small land holdings.
- Inadequate irrigation facilities and dependence of farmers on monsoon season, where good monsoon results in a vigorous growth while a poor monsoon leads to a sluggish growth for the economy as a whole.

Ministry of agriculture is also working in direction to improve the conditions of farmers by employing different programs like Insurance plan and ITC limited plan.

Animals involved in crop damage.

Animals	Damage
Rabbits	Woody plants, trees and shrubs.
Deer	Foliage and Twigs and bark
Rats and Mice	Bins, granaries, corncribs and food storage facilities.
Tree squirrels	Gnawing wires and wood decks.
Monkey	Soya bean, wheat, maize.

Crop damage percentage.

Name of the village	Crop damage percentage
kinhiraja	44%
Vakad	25%
Adoli	10%
Khandala	15%
Gohgaon	6%

PROJECT ANALYSIS:-

- ARDUINO UNO.

1. The UNO R3 development board is the low fee version of the famous UNO R3 ARDUINO, it is assembled with the CH340 USB to serial converter chip, in preference to the use of an AT mega 16U2 chip.
2. This can help to process the sensor data of projects and show the action on LCD display.
3. The Operating Voltage of Arduino is 5V.
4. The recommended voltage will range from 7V-12V and the input voltage ranges from ARDUINO is (6V-20V).
5. Digital input and output pins of ARDUINO are 14. Analog input pins 6 and others are digital pins.
6. The memory available in ARDUINO is Flash memory is 32KB, SRAM is 2KB, EEPROM is 1KB.
7. ARDUINO CLK speed is 16MHZ.

- LCD Display.

This LCD display is used to show the status as well as sensor output. It has 16 column and 2 rows. And it is work with 5V power supply.

- FLAME SENSOR.

1. It's wavelength in 760nm-1100nm range of light supply.
2. Flame sensor has 3 pins VCC, GND, DO join VCC and GND to 5V.
3. The DO connected to virtual input and output pin of ARDUINO.

- SD CARD module.

1. The micro SD card module has SPI interface that is well matched with any SD card and it use 5V.
2. VCC, GND, MOSI – Master OUT Slave IN, MISO – Master IN Slave OUT, SCK – SPI clock, CS- chip select(input).

- **SOLAR PANEL - 12 VOLT.**
- **SOLAR CHARGED CONVERTER.**

It helps to provide constant voltage and current to battery to charge efficiently.

- **LM 25 SENSOR.**
- **HUMIDITY SENSOR.**
- **SOIL MOISTURE SENSOR.**
- **PIR SENSOR.**
- **WATER SENSOR.**
- **GPRS MODEM.**
- **MOTOR.**
- **ALARM.**

CONCLUSION AND FUTURE WORK:-

The problem of crop vandalization by wild animals and fire has become a major social problem in current time. It requires urgent attention as no effective solution exists till date for this problem.

Whenever there is an object detected entering the land PIR sensor detects it and needle will be rotated towards the object and prevents entering the object into the land. When the rain water is accumulated in the land the water level sensor detects it and motor pumps the excess of water out of the land.

All these notifications are sent to the mobile phones using BLYNK application.

The interface of the ARDUINO Mega is made with the Humidity and Temperature sensor which is DHT11. The code for the DHT11 has been added to the ARDUINO Mega using the software Arduino IDE. The compilation of the code is done through the software. Code is been dumped to the Arduino Mega using the Arduino IDE. The results are verified.

This project will help farmers in protecting their orchards and fields and save them from significant financial losses and will save them from the unproductive efforts that they endure for the protection of their fields. This will also help them in achieving better crop yields thus leading to their economic wellbeing.

Large farm owners can use wireless IOT application to monitor the location, well being and health of their cattle. With this information, they can identify sick animals, so that they can be separated from the lead the herd to prevent the spread of disease.