**PROBLEM STATEMENT**

# IOT BASED SMART CROP PROTECTION SYSTEM FOR AGRICULTURE

- Crop protection is the general method or the practice of protecting the crop yields from different agents including pests, weeds, plant diseases, and other
- Apart from crops, agricultural fields would have weeds, small animals like rats, mites, insects, pests, disease-causing pathogens and frequently raided by birds. All these factors are mainly responsible for the loss or damage to the crops. Thus to yield high crop production, farmers need to protect the crop from these pests. Hence crop protection management is important before, during and after the cultivation.

- The traditional agriculture and allied sector cannot meet the requirements of modern agriculture which requires high-yield, high quality and efficient output. Thus, it is very important to turn towards modernization of existing methods and using the information technology and data over a certain period to predict the best possible productivity and crop suitable on the very particular land.

**CAUSES OF CROP DAMAGE:**

- ✓ Several factors pose significant risk to farms leading to yield reduction when they are not correctly monitored and well managed. These factors can be grouped into three categories which are technological, biological and environmental .
- ✓ The pressure to increase crop production in many countries, has resulted in the expansion of land area dedicated to agriculture and the intensification of cropland management through practices such as irrigation, use of large quantities of inputs like inorganic fertilizers and synthetic chemicals for pest and weed control leads to **affect the crop fertilization.**
- ✓ Environmental factors that affect crop cultivation include light, temperature, water, humidity and nutrition. It's important to understand how these factors affect plant growth and development.

- ✓ Either directly or indirectly, most crop protection problems are caused by environmental stress. In some cases, poor environmental conditions (e.g., too little water) damage a plant directly. In other cases, environmental stress weakens a plant and makes it more susceptible to disease or insect attack.
- ✓ Crops in the farms are many times devastated by the wild as well as domestic animals and low productivity of crops is one of the reasons for this.

**IMPACTS OF CROP DAMAGE:**

- ✓ Crop damage from extreme heat leads to affect the plant growth.
- ✓ Increased infestations of insects,animals,pests and birds leads to affect the food productivity.
- ✓ It will directly effect the production of crops and hence food. The uprise of hunger will be the main effect.
- ✓ Loss of job of farmers and other food market owners will also be the result.
- ✓ Negative effect on economy of country will also be seen as the food will have to be bought from other countries. Sale of our country food will also diminish.
- ✓ Poverty will increase and hence the suicide rate of farmers.

**PREVENT THE CROP DAMAGE IN FARMING:**

- ✓ Crop protection allows farmers to monitor climate change and notice the appearance of dangerous weeds, pests, or diseases timely.
- ✓ Analysing different parameters using the available technology and practice the cultivation of crops depends on metric values obtained.
- ✓ Crop protection solutions use AI to collect and analyze large amounts of data. It provides farmers with detailed culture and soil conditions for plant protection planning. Crop Monitoring is an excellent example of the helpfulness of remote sensing for crop protection. The platform effectively takes care of the health of the soil, reducing the risk of plant diseases and pests. Moreover, it provides data on plant health, moisture levels, and weather changes.
- ✓ Using different sensors and animal detection method can collect the data of the field 24/7 and perform the crop cultivation manually or

automatically when ever we want.This increase the productivity of farming.

- ✓ High yield , enhanced monitoring of plants like maintaining the moisture content of plant growth, time consuming are achieved by modernized agriculture technology.