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IOT Based Soil Classification and Crop Prediction ABSTRACT In India almost 70% of population are dependent on agriculture and are involved in crops production and related activities. According to the data survey 2015, it was found that India is lacking behind in the rice production from many countries. There is drastic increase in population and at the same time crop productivity remained same, hence there is a need to fulfill the increased crop demand. In order to meet the high yield of crop there is a need to use advanced technology in the field. Smart farming and precision farming are modern ways of farming .We are developing a system which is based on smart farming and precision farming using The Internet of Thing (IoT), sensors and controllers to capture soil and environment parameters and Artificial Intelligence and Machine learning to predict the types of crops suitable for cultivation. This system is a recommendation engine that makes recommendation based on type and quantity of nutrients present in the soil, weather condition present in the farm. The data is collected through the sensors present in the farm. PH sensor, Soil Moisture, Air Humidity and Air Temperature these sensors are used in this system. This sensor data is pre-processed and naive bayes algorithm is applied to classify the soil. We applied various classification algorithm for crop recommendation and found that liner learner using sagemaker has the highest accuracy score. This whole system is integrated with android mobile application which shows the list of crops to be cultivated in the respected class of soil. 7 IOT Based Soil Classification and Crop Prediction 1. INTRODUCTION A. Problem Definition To develop a system to classify soil using soil parameters and predict crop using soil and weather condition. Need of the project with motivating example India is a land of agriculture and agriculture plays a vital role in the Indian economy. Agriculture is considered as a primary means of livelihood for about 58% of the rural India. The green revolution which introduced various high yielding seeds and fertilizers undoubtedly led to increase in crop. About 70% of the population are involved in crop production and related activities. Despite the overwhelming size of the agricultural sector, however, yields per hectare of crops in India are generally low compared to international standards. Even though agriculture accounts for as much as a quarter of the Indian economy and employs an estimated 60 percent of the labor force. Still the Variation of Ecosystem in the Agriculture Land of India has leads to Growth of Various Crops. But Due to the Current Economic and Social Conditions, the Agriculture Sector is degrading its performance and other financial sectors are getting importance. Following are the consequences of degrading agriculture sector • Food Demands of Urban Cities are not satisfied. • Below Priority Level People don't get quality Pulses and Vegetables. • Malnutrition and Starvation in various states of the country. • Young farmers are not getting proper guidance for the cultivation in farming. • Appropriate use of the soil is not considered leading to loss of soil fertility • Extreme weather conditions leads to huge Loss within the farms.

•Wastage of the Certain Crops does not satisfy the needs and Desire of the farmers. 8 IOT Based Soil Classification and Crop Prediction B. Objectives of the project • To study of different types of soils and crops suitable for a type of soil. • To identify and select different types of sensor to read the parameter values suitable for identifying different soil types. • To identify and select different types of sensors to read the environment parameters suitable for identifying different types of crops for the given type of soil. • To create classification model to classify soil for given soil parameters. • To create prediction model to classify crops for given environmental parameters and soil type. • To train and test soil classification and crop prediction models. • To deploy the system on suitable cloud platform. • To build android app for farmers to interact with the system. C. Scope & limitations of the project Scope • Help in Decision Making for the Farmers which crop to be produce with the respective conditions • Farmers will known its appropriate condition for the soil health. • It help Government Agricultural Organization to know the actual Soil • Increase in the Crop Production raises to Economic Benefit in Agriculture Sector. Limitations • Dynamic Nature of Soil • Changing Weather Condition for the Long-Time • Uncertainty within the Environmental Factors such as Rainfall, Drought Conditions

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