Abstract

agriculture is the primary source of income for t majority of people across the globe. Agriculture plays a significant role in a country's economic development. Climate change and other environmental developments have posed a serious threat to agriculture. Farmers cultivate the same crops year after year without experimenting with new varieties, and they apply fertilisers in an ad hoc manner without understanding the deficient content or quantity. As a result, this has a direct impact on crop production, as well as causing soil acidification and damage to the top layer.

By looking at the past few years, there have been significant developments in how machine learning can be used in various industries and research.

the system is designed using machine learning algorithms and flask for betterment of farmers. Our system will suggest the best suitable crop for particular land based on content and weather parameters like temperature, humidity, pH, rainfall.

the system provides information about the required content and quantity of fertilizers like calcium, magnesium, potassium, sulphur, nitrogen, lime, carbon, phosphorous, moisture. Using all these data the system will predict the most suitable crop and most suitable fertilizer for farmer. This system will be an extra hand to the farmers. Hence by utilizing this system farmers can cultivate a new variety of crop, may increase in profit margin and can avoid soil pollution.

Introduction

Crop yield expectations are a major agricultural concern. Climate and pesticides have a significant impact on agricultural yield. Exact data on past harvest yields is critical for making decisions related to farming dangers and future expectations. The analysis of teaching machines to learn and build models for future forecasts is widely used, and for good reason. Agribusiness assumes a basic job in the worldwide economy. Agribusiness plays a vital role in the global economy. Understanding total harvest yield is critical to addressing food security issues and mitigating the impact of environmental change as the human population continues to grow. With the impact of environmental change in India, the majority share of agrarian yields has been negatively impacted in terms of presentation over the last two decades.

Predicting the harvest yield well ahead of time would aid in the promotion and capacity-building steps. Such standards would also assist related agreement producers and ranchers in fitting their livestock. Enterprises for managing their business's teamwork. Harvesting is a mind-boggling feat that is influenced by climatically input parameters.

The input parameters for agribusiness vary from field to field and rancher to rancher. Obtaining such information for a larger area is a daunting task. Nonetheless, the Indian Meteorological Department gathered climatic data at each square metre territory in various parts of the district. Furthermore, the yield of each harvest in each state is consistently gathered and distributed by the agribusiness and partnership division. Such data sets are currently being used to forecast the effect on significant harvests and, as a result, their yield in a future year.

Motivation:

Prior crop prediction and yield prediction was performed on the basis of farmers experience on a particular location. They will prefer the prior or neighbourhood or more trend crop in the surrounding region only for their land and they don’t have enough of knowledge about soil nutrients content such as nitrogen, phosphorus, potassium in the land.

Being this as the current situation without the rotation of the crop and apply an inadequate amount of nutrients to soil it leads to reduce in the yield and soil pollution (soil acidification) and damages the top layer. And also, many people not have proper knowledge on using fertilizers, using more fertilizers will damage land.

Considering all these problems takes into the account we designed the system using a machine learning for betterment of the farmer. Machine learning (ML) is an emerging technology targeting the agriculture sector. Machine learning as part of artificial intelligence, has emerged together with bigdata technologies and high-performance computing to create new opportunities for data intensive science in the multi-disciplinary agrotechnology domain.

Literature review

Anil Suat Terliksiz et.al., concentrated on soybean yield forecast of Lauderdale County, Alabama, USA utilizing 3D CNN model that use the spatiotemporal highlights [1]. The yield is given from USDA NASS Quick Stat apparatus for a considerable length of time 2003-2016. The expectation of harvest yield has direct effect on national and worldwide economies and assume significant job in the nourishment the executives and nourishment security.

Niketa Gandhi et.al. [2] Proposed a choice emotionally supportive network model for rice crop yield forecast for Maharashtra state, India. A GUI has been made in Java utilizing NetBeans apparatus and Microsoft Office Access database for the simplicity of ranchers and leaders. The interface takes into account the determination of the scope of precipitation, least temperature, normal temperature, most extreme temperature and reference crop evapotranspiration and predicts the normal class of yield viz., low, moderate or high.

Ranjini B Guruprasad et.al.,[3] introduced a contextual analysis of climate and soil information-based yield estimation demonstrating for paddy crop at various spatial goals (SR) levels, to be specific, at the area and taluk levels in India. We give a point by point investigation of precision of the yield estimation models across changed arrangements of highlights and diverse AI systems. Nilima et.al., [4] introduced a thought for example to how to send WSN on field and how Machine learning model is fitted for forecast of bug/ailments utilizing Naive Bayes Kernel Algorithm.

Remote Sensor Network is new innovation to world and nation like India where it can utilize in Agriculture Sector in India for expanding yield by giving early expectation of plant sicknesses and bug. This can be occurred by taking crude information from field where WSN organize is introduce and with fitting proper AI model for this information to get anticipated yield.

Shruti Kulkarni et.al., presents a model for example an information driven model that learns by notable soil just as precipitation information to break down and anticipate crop yield over seasons in a few locales, has been created [5]. For this investigation, a specific yield, Rice is considered. The planned half breed neural system model distinguishes ideal mixes of soil parameters and mixes it with the precipitation design in a chose locale to develop the expectable harvest yield. The spine for the prescient investigation model regarding the precipitation depends on the Time-Series approach in Supervised Learning.

T. Mhudchuay et.al. [8] Concentrated on downpour took care of rice where the fundamental activities are when to begin development and when to collect. The objective is to locate the ideal development and collect period to such an extent that ranchers' salary is amplified. This paper speaks to a use of a Deep Q-learning in the rice crop development practice, where the ideal activities are resolved. Shivi Sharma et.al., [9] proposed a technique utilized, in that dirt and condition highlights for example normal temperature, normal stickiness, all out precipitation and creation yield are utilized in anticipating two classes in particular: great yield and awful yield.

Suhas S Athani et.al. [10] Presents the data relating to the harm of harvests as of late because of the development of weeds. Weeds are one of the significant hazards to the genuine home and mankind. Right now, thought, Support Vector Machine (SVM) Classifier is used to make out whether plant is harvest or weed. The maize crops are consistently observed by catching pictures utilizing camera. So as to group a plant as a yield or weed, different highlights are removed which among them are shape, surface, shading.

Problem Statement:

The works done till now only concentrated on crop prediction using different soil properties and Data Mining Techniques. Fertilizer Recommendation is not taken into consideration. So, it is necessary to develop crop prediction and fertilizer recommendation system which predicts crop based on weather features like temperature, humidity, etc. and recommend fertilizer based on chemicals such as nitrogen, sulphur, etc.

Existing System:

An agro-based country depends on agriculture for its economic growth. When a population of the country increases dependency on agriculture also increases and subsequent economic growth of the country is affected. In this situation, the crop yield rate plays a significant role in the economic growth of the country. So, there is a need to increase crop yield rate. Some biological approaches (e.g. seed quality of the crop, crop hybridization, strong pesticides) and some chemical approaches (e.g. use of fertilizer, urea, potash) are carried out to solve this issue. In addition to these approaches, a crop sequencing technique is required to improve the net yield rate of the crop over the season. One of existing system we identified is Crop Selection Method (CSM) to achieve a net yield rate of crops over the season.

Proposed System:

The Proposed system will predict the most suitable crop and fertilizer for particular land using decision tree regression, random forest, neural network models and based on weather parameters such as Temperature, Humidity, soil PH, Rainfall and required content and quantity of fertilizers like calcium, magnesium, potassium, sulphur, nitrogen, lime, carbon, phosphorous, moisture.