

EXPLORATORY ANALYSIS OF RAINFALL DATA IN INDIA FOR AGRICULTURE

ABSTRACT

Rainfall has been a major concern these days. Weather conditions have been changing for time being. Rainfall forecasting is important otherwise, it may lead to many disasters. Irregular heavy rainfall may lead to the destruction of crops, heavy floods that can cause harm to human life. The farmers are emotionally and financially affected as their years of hard work go in vain. As a result of the reduction in agricultural production due to unstable climatic conditions, global warming etc., predictive analytics is expected to solve the problems of the farmers. Today, through the application of new information and communication technologies, it is possible to predict the onset or change in the severity of diseases using modern big data analysis techniques. In this paper, we present an analysis and classification of research studies conducted over the past decade that forecast the onset of rainfall at a pre-symptomatic stage or at an early stage. We will be using classification algorithms such as Decision tree, Random forest, KNN, and xgboost.

LITERATURE SURVEY

PAPER 1. RAINFALL PREDICTION USING MACHINE LEARNING TECHNIQUES

Rainfall prediction is not an easy job especially when expecting the accurate and precise digits for predicting the rain. The rainfall prediction is commonly used to protect the agriculture and production of seasonal fruits and vegetables and to sustain their production and quality in relation to the amount of rain required by them. The rainfall prediction uses several networks and algorithms and obtains the data to be given to the agriculture and production departments. The rainfall forecasting is prevailing as a popular research in the scientific areas in the modern world of technology and innovation; as it has a huge impact on just the human life but the economies and the living beings as a whole. Rainfall prediction with several Neural Networks has been analyzed previously and the

researchers are still trying hard to achieve the more perfect and accurate results in the field of rainfall prediction.

PAPER 2. A STUDY OF RAINFALL PREDICTION TECHNIQUES

Thirumalai, Chandrasegar, et al. discusses the amount of rainfall in past years according to the crop seasons and predicts the rainfall for future years. The crop seasons are Rabi, Kharif and Zaid. Linear regression method is applied for early prediction. Here, Rabi and kharif were taken as variables if one variable was given then other can be predicted using linear regression. Standard deviation and Mean was also calculated for future prediction of crop seasons. This implementation will be used for farmers to have an idea of which crop to harvest according to crop seasons. Kar, Kaveri, Neelima Thakur, and Prerika Sanghvi has used the fuzzy logic approach for the prediction of rainfall on the data of temperature in a geographic location. The fuzzy model has been applied Due to other climatic factors the prediction is not accurate so they have considered other influencing factors like humidity also analyzed the advantages of fuzzy system over other techniques.

PAPER 3. PREDICTING RAINFALL FOR AGRICULTURE IN INDIA USING REGRESSION

In the past, there are many types of research conducted to analyze rainfall and their effects on agriculture by various research groups. There has been much research that has been done for predicting the rainfall. While using well trained machine learning algorithm, and increasing the efficiency to predict rainfall has shown an upward trend. Having prior information about the rainfall can be useful. A study by [Parmar et al.,] predicted rainfall and aimed to give non-expert easy access about the prediction techniques and the approaches that are used. In research, several models were used for rainfall prediction and the findings depicted that Artificial Neural Network makes its most favored approach due to nonlinear relationships in rainfall data and its ability to grasp from past. So the prediction enhanced the average profit done by the farmers and can reduce the

migration of the labor due to the loss from the village.

PAPER 4. PREDICTIVE ANALYTICS IN AGRICULTURE: FORECASTING PRICES OF ARECANUTS IN KERALA

Over the past few years, the prices of arecanuts had its peaks and valleys affecting the farmers and suppliers as a whole. India has the largest production of arecanut based on the FAO statistics of 2013, with Kerala and Karnataka being the leading producers in the country, in terms of area and production. Climate change and government policies have affected the production and prices of crops. Price variation is a common phenomenon in the agricultural markets. The application of price forecasting in agriculture was discussed in using exponential smoothing, ARIMA, expert judgement, econometric model and composite forecasting for predicting the prices of hogs in the US with forecasts from ARIMA models responding quickly to price variation. The proposed models were ARIMA (1, 0, 1), ARIMA (1, 1, 1), ARIMA (0, 1, 1) for the Assam markets and log ARIMA (0, 1, 1), log ARIMA (1, 0, 1) with a linear trend and a man-made intervention and log ARIMA (0, 1, 1) with a linear trend and a man-made intervention for the Meghalaya market. Machine learning models such as Artificial Neural Network (ANN), Support Vector Machine (SVM) and Relevance Vector Machines (RVM) are mostly used for forecasting non-linear time-series models.

PAPER 5. EXPLORATORY DATA ANALYSIS AND FORECASTING THE INDIAN WEATHER USING MACHINE LEARNING

In India a few investigations have been completed to decide the progressions on relationship of temperature with environmental modification. They inferred that it is observed no broad inclination can be seen increment as well as lessening in these readings. The breaking down of the arrangement of time of average yearly readings done a bunch of 8 weather stations of India. the patterns of decadal in environment all across India provided the primary signs of the daytime deviation of weather patterns across India is very not moderately the same as which saw across numerous different pieces around the world. The diminishing pattern in reading of temperature across the vast majority on the northerly pieces of the

nation, combined through an expanding pattern across southerly parts, and an in general marginally expanding pattern of the request for 0.30°C remained during the most recent century. It can be seen temperature in rainy season doesn't demonstrate a critical pattern at all in significant pieces in our nation with the exception of a huge negative pattern across northwestern parts of our country.