EXPLORATORY ANALYSIS OF RAINFALL DATA IN INDIA FOR AGRICULTURE

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ABSTRACT:

It is a known fact that uncertainty of rainfall in India leads to a lot of disaster every year like flood, drought, agriculture destination etc. Also, some of the parts of India have abundance of rainfall and some parts go completely dry. This type of differences in rainfall creates lot of problems in Indian economy. Accuracy of rainfall forecasting has great importance in India where economy is largely dependent on agriculture. The dynamic nature of rainfall also increases failure in statistical accuracy. Rainfall prediction is extremely helpful to avoid flood which can save lives and properties of humans.

PROBLEM STATEMENT:

Climate is important aspect of human life. So, the Prediction should accurate as much as possible. In this paper we try to deal with the prediction of the rainfall which is also a major aspect of human life, and which provide the major resource of human life which is Fresh Water. Fresh water is always a crucial resource of human survival – not only for the drinking purposes but also for farming, washing and many other purposes. Making a good prediction of climate is always a major task because of the climate change.

Now climate change is the biggest issue all over the world. Peoples are working on to detect the patterns in climate change as it affects the economy in production to infrastructure. So as in rainfall also making prediction of rainfall is a challenging task with a good accuracy rate. Making prediction on rainfall cannot be done by the traditional way, so scientist is using machine learning and deep learning to find out the pattern for rainfall prediction.

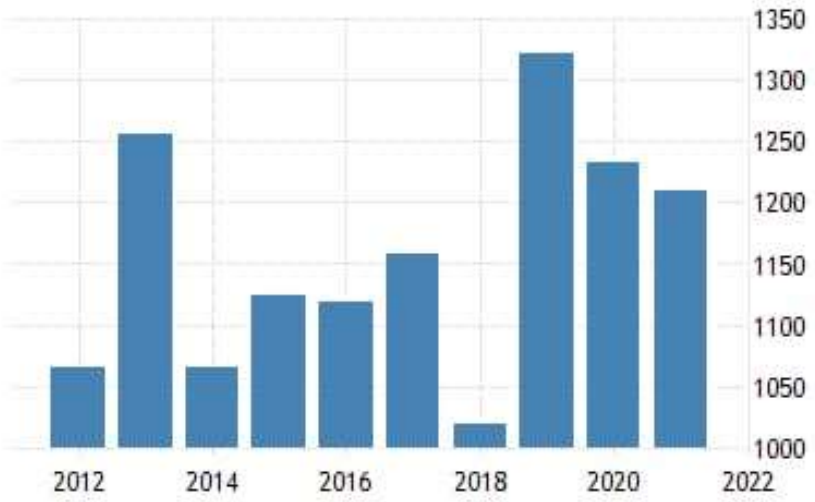
A bad rainfall prediction can affect the agriculture mostly framers as their whole crop is dependent on the rainfall and agriculture. It is always an important part of every economy. So, making an accurate prediction on the rainfall. There are number of techniques are used of machine learning, but accuracy is always a matter of concern in prediction made in rainfall.

There are number of causes made by rainfall affecting the world ex. Drought, Flood, and intense summer heat etc. And it will also affect water resources around the world.

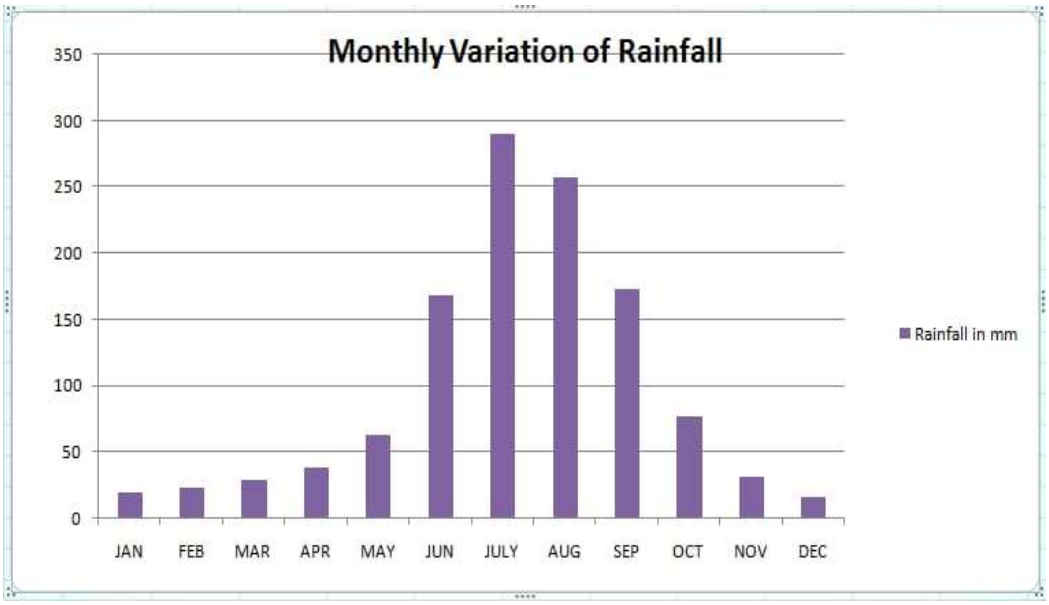
Our major concern is the major downfall to the rainfall on yearly bases as we can see in Fig 1 the graph show there is the major downfall to the yearly rainfall in millimeter.

The below graph image shows that Rainfall in each year in India

- X-axis: Year
- Y-axis: Rainfall in mm



As we do further detail about the rainfall in India on monthly bases in Fig 2. And compare the in monthly bases rainfall.



Approximately 98% of our water in our earth is salty and only 2% is fresh which can be used for drinking purposes. Of that 25, almost 70% comes from the snow and ice, 30% is ground water and less than 0.5% is the surface water which are lake, river etc. and 0.05% is in our atmosphere.

The amount of rainfall is sufficient to cover the water needs of the various crops. Excess water may cause problems for plant growth and thus drainage is required. Effective rainfall and its significance are primary source of water for agricultural production for most of the world is rainfall. In its simplest sense, effective rainfall means useful or utilizable rainfall. Rainfall is not necessarily useful or desirable at the time, rate, or amount in which it is received. Precipitation, especially rain, has a dramatic effect on agriculture. While a regular rain pattern is usually vital to healthy plants, too much or too little rainfall can be harmful, even devastating to crops. Drought can kill crops and increase erosion, while overly wet weather can cause harmful fungus growth. Besides, how rain is important for farmers? Water is essential for all life on the farm. Farmers obtain most of the water for their crops

From their rain. Rainfed agriculture covers 80% of the world's cultivated land and contributes about 60% to the total crop production (UNESCO, 2009). Low productivity in many arid and semiarid rainfed agricultural systems is often due to degraded soil fertility and limited water and nutrients input. With rising concerns over the high cost of expanding large-scale irrigation and the environmental impacts of large dams, upgrading rainfed agriculture is gaining increased attention (Rockström et al., 2007). Many people dependent on rainfed agriculture are highly vulnerable to both short-term dry spells and long-term droughts. Exposure to these risks can contribute to a reluctance to invest in agricultural inputs that could increase crop yields. Moreover, changing precipitation patterns resulting from climate change will compound this issue for many small farmers.

PROPOSED SOLUTION:

MACHINE LEARNING:

We are going towards the time zone of artificial intelligence where everything is controlled and handled by the machine. Machine learning is the subset of artificial intelligence where we teach the machine to learn by itself without the help any external source. In machine learning we teach the machine to learn from its previous data and try to improve its result in future by taking lesson from its previous decision. Part of machine learning includes the uses of tools, methods and techniques which help it form better results. These methods and algorithms provide machine and us a new approach to explore the new knowledge from and given data or the by exploiting the traditional datasets. In turn modelling stimulate the people to have a better understanding of the situation. Machine learning method have a slight have a history of statistics. It’s helpful for exploring more complicated learning model to take out the true message hidden in large amount of data.

Although both machine learning technologies and traditional statistics tools can be applied in data analysis, their fundamental principles and characteristics have a great different. As

compared to statistics data analysis, the exclusive advantages of machine learning includes enumerated benefits which are : we can process big data and real-time data streams with mixed values types, we can select from different learning models and controlling parameters to capture the non-linear or high-order structure in data, we can also recognize complicated patterns that cannot be represented in different mathematical terms, visualization of the data for making a prediction and we can also integrate the learning models with other different databases management system.