

INTRODUCTION

Agriculture is a key activity of human being since it provides basic needs such as food, clothing and shelter. It has been demonstrated that every 1% increase in agricultural yield translates into a 0.6-1.2% decrease in the numbers of absolute poor households in the world. There are a variety of factors associated with crop yield and the risks involved with farming. The four most important factors that influence crop yield are soil fertility, availability of water, climate, and diseases or pests. Out of all these factors, availability of water has the most direct impact on the crop yield. Too little precipitation can cause crops to wither and die, whereas excessive rainfall (especially when it follows irrigation) will also have adverse effects on crop growth. Other than this one of the most overlooked and yet an important factor is the climate of the area where the crop is being grown. Climatic conditions extend beyond just " " and " ". While annual precipitation is an important aspect of climate, there are other aspects to consider as well, such as minimum and maximum temperature of the district, wind speed and weather patterns. Planting crops outside the specific climate that they require can negatively impact the crop yield.

Keeping this in my mind we searched for various datasets which could tell us about the crop yield in Telangana for the span of three years i.e 2016, 2017 and 2018. We used datasets which had information about the minimum and maximum temperature in the 31 districts of Telangana, the rainfall for each year and the crop yield for the 3 crops of Bengal gram, groundnut and maize. After we found the datasets that we required, we cleaned it and then combined it to make a single dataset which could be used for modelling. After we explored and visualised this single dataset we performed PCA to find which factor amongst the ones we were taking into consideration had the highest impact on the yield after which we performed linear regression and various optimisation techniques to form a model which could accurately predict future crop yields given that we knew the values of factors such as temperature and rainfall and the district the crop was being produced in.

After visualisation we saw that over the span of 3 years the average maximum and minimum temperature was 41.43 and 14.84 degree Celsius respectively for the entire State of Telangana combined.

Also using Power BI we obtained these charts which tell us that Wanaparthy has highest Bengal gram yield whereas Warangal Rural district has the highest crop yield for Groundnut and Maize. Overall we can see that yield of Maize is highest for all districts followed by Groundnut and then Bengal gram. The Rural region of Warangal has highest yield whereas Hyderabad being a city has very low to 0 yield.

This concluding our project we performed PCA. We see that Total Rainfall affects our crop yield. This technique is also useful in dimension reduction this reducing computation, as we see that the 3 PC capture more than 85% variability of the data.

Below is a graph comparing the values of Actual and Predicted yield values. As we see the graph lines are quite closely related we can say that are predictions are quite accurate.

POLICY RECOMMENDATION

Since, Telangana is not surrounded by any of the major water bodies, the major sources of water is the rainfall and the rivers flowing through the state The first strategy and the actions relate to 'Rain Water Harvesting and Ground water Conservation/Recharge'

URBAN AREAS

The ground water conservation in urban areas emphasizes on roof top rainwater harvesting systems on buildings along with combined recharge systems to be implemented.

RURAL AREAS

In respect of ground water conservation in rural areas, the emphasis is more on rehabilitation of village ponds and reservoirs for water storage and conservation

INDUSTRIAL AREAS

In industrial areas, we should ensure careful implementation of the rain water harvesting and promote use of the ground water recharge techniques The polluted effluent of industries be treated for its maximum reuse and recycle Due to risk of ground water pollution, 'recharge well method' should not be encouraged