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Water demand prediction using the KNN algorithm

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ABSTRACT

Many factors influence irrigationwater requirement in an agriculture field. those factors are age of plant, type of soil, temperature, level of sunlight, water needed. Despite the multiplesolution proposed, still the quantity of water overflood and underfloor in the agriculture felid. The artificial influence on irrigation requirement should be thought of an important impact factor, considering the requirement of water, the technology can help in preserving large quantity of water in agriculture felid. development of complex and elaborate forecasting methods such as artificialneural network (ANN)can be costly to develop and implement with the limited recourses available.

Keywords: *Crop Water Demand, Forecast, Crop To Crop Modeling, KNN Modeling; Water Utility Demand Prediction*

1. INTRODUCTION

Increasing food demand will challenge the agriculturalsector globally over the next decades1. A sustainable solution to this challenge is to increase crop yield without massive cropland area expansion. This can be achieved by identifying and adopting best managementpractices. To do so requires a more detailed understanding of how crop yield is impacted by climatechange2,3 and growing-season weather variability4. Even with that knowledge, prediction is challenging because various factors interact with each other. For example, variability in soil type can interact with weather conditions and mitigate or aggravate climate- related impacts on crop yield5,6. Additionally, seedgenetics (G) and crop management decisions (M), interact with the effect of environment (E: soil and in- season weather conditions), thereby resulting in a near infinite number of combinations of G × E × M that can impact crop yield. Irrigation water is the main component of off-stream water uses. It is important to reasonably estimate irrigation water demand. At present, the forecast methods at home and abroad are mainly of three types: The Judgment method, based onthe individual and collective experience and knowledgeto make predictions.

2. LITERATURE REVIEW

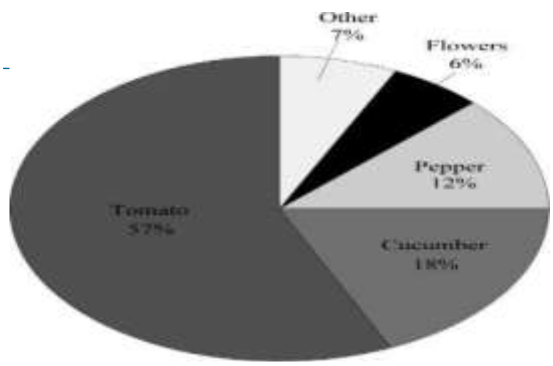

Chart-1: Crop breakdown in year

The other factor which was taken into considerationwas time,heat,temperature, wind etc Linear Regression Because of the seemingly linear relationship shown in Figure 2 between both crops' watering schemes, the use of a linear regression model was appropriate. In a typical water demand forecasting situation, the use of a single linear regression model is unwarranted due to its inability to handle multiple indicators of water demand usually present in a complex highly non-linear relationshipbetween consumers and various socio-economic and climactic factors . In this case the mode linvolved two variables, which were treated as both dependent and independent, and were shown tohave a linear relationship. By

The Algorthim used by research was linear regression and feed forward Nural Network (FFNN) to forecast the demand of water need to grow multiple crops. According to survey the proposed system was efficient only upto 29% in terms of prediction. The research done in year 202,the research published an intelligence controlled system for artificial irrigation basses on ANN(artificial neural network).the structure of proposed system uses wireless sensor and water demand prediction algorithm to predict the demand of water.

The result show the need of water in each month by multiple crop shown below.

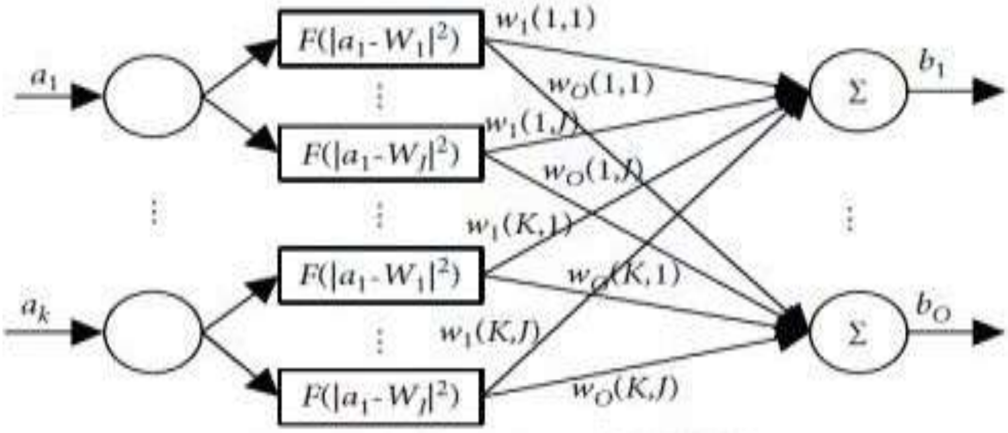

FIGURE 1: Structure of RBFNN.

Chart-2: Structure of RBFNN

The researcher took soybean crop to predict the result and declar that there is conflict in the result obtained

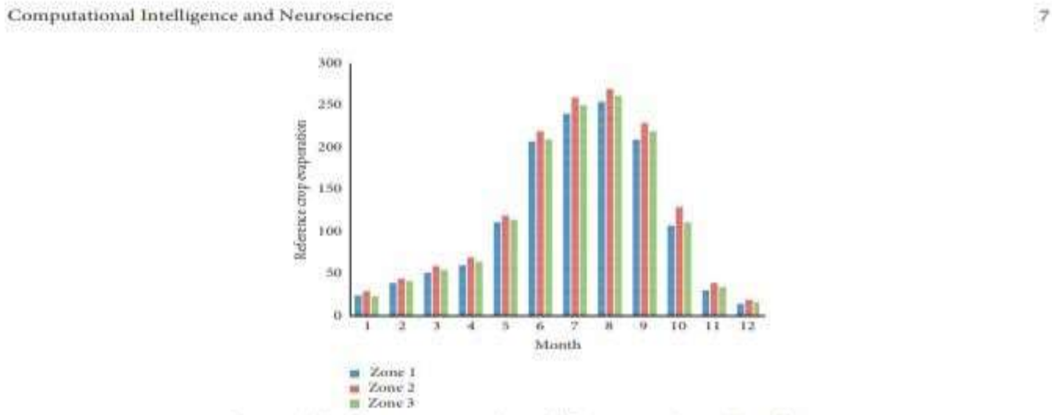

FIGURE 6: Monthly mean evaporations of different zones in an irrigated area.

Chart-3 :Monthly mean evaporations of different zones in an irrigated area.

As can be seen from the trend, the GM(1,1) model cannot reflect changes in the single factors due to its characteristic of only considering the change of time series. Although the linear regression result fluctuates up and down with rainfall, the predicted values are significantly larger because they do not consider the change of water-saving level year by year.
It is also shown that the impact of climate changeon irrigation water requirement has been reduced but the influence of human factors enhanced. The regression equation considering the irrigation water- saving technology changes can not only reflect the influence of different years, but also reflect the effects of water saving technology progress, so the simulation result is better.

3. PROPOSED SYSTEM

In the proposed system, the abusive content is checked and flagged by the machine rather than other users. Certain disrespectful words/slang is reported as abusive and the same is intimated to the user. The bullied user is then prompted if they want the abuser to be blocked and reported. If the user opts to block the other person, it is done immediately, if not, then such case is treated as a false-positive..

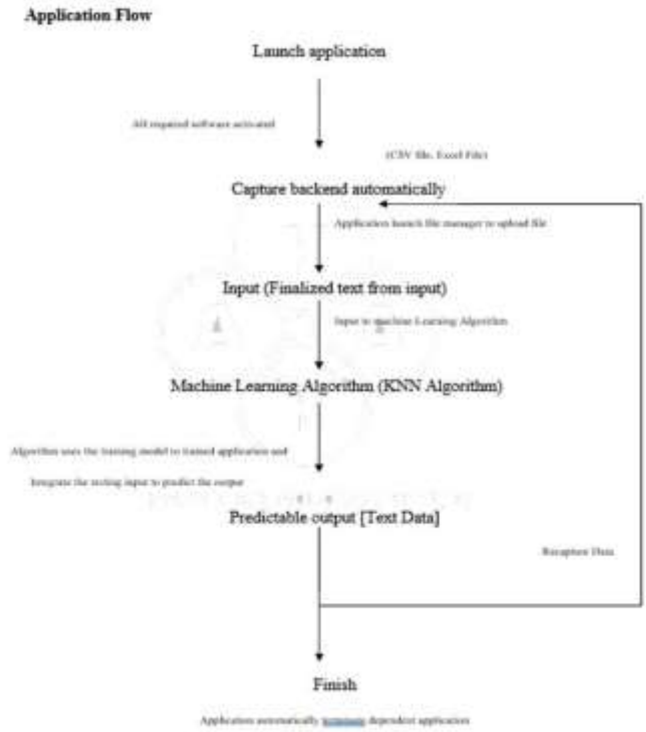

Chart-4:System operation flow daigram

Table-1: Result Data

Plantname	Age ofplant	Temperature (in degreeCelsius)	Types of soil	Water needed (in ltrs)
Arecanut	60 years	14-36	Laterite, red loam, alluvial soil	19-23
Paddy	90-120 days	21-37	Coastal planins	1.1-1.25
Wheat	135-180 days	20-25	Loam texture or Clay loam	0.95-2.5

4. CONCLUSION

Irrigation water requirement is mainly affected by climate change and human factors. Rainfall is the main climate factor and human factors include irrigation area, irrigation technology level, etc. The concept of the water-saving improvement coefficient is introduced into the water demand forecasting model based on the dual characteristic of “artificial–natural”.

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