ANALYSIS OF POTENTIAL EVAPOTRANSPIRATION (PET) USING ANN TECHNIQUE IN EASTERN U.P.

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ABSTRACT

The change in temperature is expected to alter precipitation and evapotranspiration, the prime drivers of water availability and agriculture production. Climate change due to evaporation is concern not only to the scientific community but for policy maker as well. The key factors in determining agricultural potential is the adequate supply of water. The water supply may be effected by changes in quantity and timing of precipitation. The possible effect of climate changes in terms of evaporation on surface are investigated using data driven model as ANN (Artificial Neural Network) for some part in eastern Uttar Pradesh.

Artificial neural networks are built from synchronous processing elements, akin to the central nervous system in living organisms. The basic unit, or building block, of the network is the neuron. The neurons are connected together by links called synapses, and each synapse has a given weight factor. As the synapses are built up, a network is formed. This network then has to undergo training in order to match a specific set of known target outputs for any given set of known inputs. A feed-forward hierarchical neural network was used for this work.

An Artificial Neural Network based modeling technique has been used to study the influence of meteorological parameters on evaporation. Several layers with different neurons were tried to find out the importance of different neurons in Neural network modeling in the prediction of evaporation. The prediction accuracy of Artificial Neural Network has been verified with various performance indices. The highest correlation coefficient (.....) along with lowest root mean square error (.....) was obtained with the input combination of five meteorological parameters for model number .....

Five inputs as Precipitation (PPT), Vappour Pressure (VP), Wet Day Factor (WDF), Cloud Cover (CC), and Avg. Temperature (TEMP) are used as input data and Potential Evapotranspiration (PET) is used as output. The final weights assigned in last layer has obtained in model development. Models have been developed for different number of neurons. A graph between the actual and predicted values of evaporation suggests that most of the values lie within a scatter of ±15% with all input parameters. The findings of this study suggest the usefulness of ANN technique in predicting the evaporation losses from surface.