Comparison of spatial interpolation methods for estimation of weekly rainfall in West Bengal, India

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ABSTRACT. Rainfall is one of the most eloquently researched contemporary meteorological phenomena affecting the agricultural practices dramatically, particularly along the humid, sub-tropics, where agriculture is predominantly rainfed. It is a key parameter of agricultural production in West Bengal due to lack irrigation facilities in most of the areas. Thus, it is very important to have detailed information of rainfall distribution pattern of West Bengal. In practice rainfall data is collected only at few discrete stations scattered all over the whole state. However, rainfall is a spatially continuous phenomenon rather than discrete. Thus it becomes essential to apply a robust spatial interpolation technique to transform the discrete values into a continuous spatial pattern. In the present study, three spatial interpolation techniques namely Kriging, Inverse Distance Weighted (IDW) and SPLINE, are used for a comparative analysis to identify the most efficient interpolation technique. Weekly average rainfall data available between 1901 and 1985 are used for the analysis. The errors of the three interpolation techniques are analyzed and the best method is chosen based on the minimum mean absolute deviation (MAD) and the minimum mean squared deviation (MSD) criteria. The IDW method is found to be the best spatial interpolation technique.

Key words – Agro-meteorology, KRIGING, IDW, SPLINE, MAD, MSD.