

Suitability of Reanalyzed Precipitation Data as an Alternative Source for Missing Data: A Case Study in Dry Zone, Sri Lanka

K.C. Kaushalya^{1*}, A.D. Ampitiawatta², E.M. Wimalasiri², J.B.D.A.P. Kumara²

¹Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

²Department of Export Agriculture, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka

*chathurick2008@gmail.com

Owing to the availability over long spatial and temporal scales, reanalyzed data are widely used in climatological studies. However, the reliability of such datasets depends on location and time. Often it requires analyses of the fitness before the climatological application. Therefore, the objective of this study was to identify the most reliable reanalyzed precipitation data source to overcome the issue of missing data in the dry zone of Sri Lanka. The observed precipitation data from Anuradhapura, Puttalam, and Batticaloa for the period of 1985 to 2005 were regressed against the reanalyzed data of Asian Precipitation – Highly Resolved Observational Data Integration Towards Evaluation (APHRODITE), Multi-Source Weighted Ensemble Precipitation (MSWEP), and NASA Power Prediction of Worldwide Energy Resources (NASA POWER). Raw daily precipitation data, Annual total precipitation, and Number of rainy days per annum were the selected weather parameters. Root Mean Square Error (RMSE) and correlation coefficient were used to identify the most fitted reanalysis data source. The lowest estimated RMSE values for daily precipitation 5, 10, and 5 mm and highest correlation coefficient were observed as 0.9, 0.78, 0.83 in APHRODITE at Anuradhapura, Batticaloa, and Puttalam respectively. Similarly, Annual precipitation showed the lowest RMSE in Batticaloa and Puttalam as 378 and 177 mm and the highest correlation coefficient as 0.91 and 0.77 for APHRODITE. In contrast, the lowest RMSE and the highest correlation coefficient for the number of rainy days were observed in MSWEP data. Based on the result, APHRODITE data shows the higher potential of using as an alternative data source to fill the missing precipitation data in the Dry Zone of Sri Lanka.

Keywords: APHRODITE, MSWEP, NASA POWER, Reanalyzed Data