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The Drought Interest Group extreme events prediction from seasonal climate forecasting and distributed hydrological modelling simulations

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Seasonal climate forecasting information can be utilized by water resource managers for planning activities reducing uncertainty with the additional predictive information. However, actual basin-scale use of this information is still limited due to limitations in accuracy and lead time. The aim of this study was to determine the predictability of extremely dry and wet conditions by looking into past extreme events and simulating at the basin-scale how well these extreme events can be reconstructed in the Pampangga river basin, Philippines. A 3-month seasonal climate forecast model derived from the MIROC-5 Ocean Atmosphere Global Circulation Models were used to drive the water and energy Budget-based Distributed Hydrological Model. Extremely dry and wet years in 1982-2000 were selected and integrated into the hydrological model WEB-DHM. The improved seasonal climate forecast system of the experimental season was constructed using the System for Prediction and Assimilation (SPAM) derived from the Ocean-Atmosphere global circulation model MIROC 5.0. This was used as input for the hydrometeorological parameters in the distributed hydrological model and incorporated to drive the basin simulations for the selected basin. Results showed that the SCFs were able to predict the severity of extreme events in the basin of up to 2 months. Accuracy in the prediction of extreme events such as floods and droughts are difficult. Basin-scale predictability of extreme events is important in local livelihoods and industries within the communities. Adaptation measures to address these extreme events were identified to minimize its negative impacts.