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GloFAS extended range flood forecast skill for the major river basins in Bangladesh

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Flooding is the most common natural hazard in Bangladesh, occurring annually and causing huge economic losses. There are several reasons that cause flooding-geographical location, topography, monsoon climate etc. The country is located at the downstream of the three big river basins-the Ganges, the Brahmaputra and the Meghna; and during the monsoon period (June to September) transboundary flow from these basins comprises the main source of flood water. Flood Forecasting is an important flood management tool that can reduce flood damage. The short-term forecast is quite useful for the emergency management. However, extended range forecast plays more important role for agricultural planning. Therefore, for better flood preparedness extended range forecast is very useful for a flood vulnerable country like Bangladesh. The GloFAS forecast is run by ECMWF as part of the Copernicus Emergency Management Service and provides 30 days flood forecast for the major river basins in the world. The GloFAS extended range forecast is also available for the Ganges, the Brahmaputra and the Meghna river basins in Bangladesh. It is important to understand the forecast bias and uncertainty associated in the extended range forecast. Therefore, the aim of the research to evaluate the forecast skill of this extended range forecast. The study applies different statistical methods such as false alarm ratio, probability of detection and reliability diagram to evaluate forecast performance. The GloFAS forecast rerun data for the period 1997 to 2017 has been used in this study. The flood forecast information such as magnitude, time to peak and duration is key for the flood preparedness action. The present study shows that extended range forecast provided by GloFAS is very consistent capturing the peak flow of the major river basins in Bangladesh. The study will help to develop an effective extended range flood early warning system based on the available GloFAS forecast for Bangladesh.

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