Geomorphology, Hydrology and Human-Environment Interactions in the Kosi Megafan, India
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The continuing channel modification and change in the course of the River Kosi have got a greater implication on the geomorphic evolution processes within its megafansurface. A considerable portion of the land in Kosi megafan remains flooded and later waterlogged every year, a phenomenon that has been exacerbated by the rapid development of roads and railroads. Crop yields are also lowest in parts of the megafan where waterlogging is a bigger problem. This research applies GIS and remote sensing techniques to examine the Kosi channel change from 1975-2015 and map waterlogging and transport network driven ‘disconnectivity’ of the Kosi megafan located in the Indo-Gangetic Plains, India from 2005-2015. This study also used semi-structured interviews of 960 farm households from four case studies to analyze farm-related changes, especially due to waterlogging and identify factors responsible for a farmer’s adaptation to waterlogging stress from 2014-2015. The findings reveal that there have been substantial changes in the main Kosi channel. The massive development in the road-rail transport network along with the increase in the minor channels within the megafan have led to staggering increase in transport-river intersections and foster both seasonal and permanent waterlogging. The case studies suggest that 90% of the farmers have made changes to their farms due to waterlogging and other factors associated with that. The study also shows that there are limits to adaptation, which are caused by barriers of available technology, knowledge and institutional frameworks. These barriers undermine the effectiveness of the initiatives promoted both at the national as well as local level.