

## Satellite Solutions for Koshi Floods

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**Abstract :** The Koshi River, acknowledged as the "Sorrow of Bihar," poses intricate challenges characterized by recurrent flooding. Within the Koshi Basin, floods have historically inflicted damage on infrastructure, agriculture, and settlements. The Koshi River exhibits a highly braided pattern across a 48 km stretch to the south of Chatara. The devastating flood from the Koshi River, which began in Nepal's Sunsari District in 2008, led to significant casualties and the destruction of agricultural areas. The catastrophe was exacerbated by a levee breach, underscoring the vulnerability of the region's flood defenses. A comprehensive understanding of environmental changes in the area is unveiled through satellite imagery analysis. This analysis facilitates the identification of high-risk zones and their contributing factors. Employing remote sensing, the analysis specifically pinpoints locations vulnerable to levee breaches. Topographical features of the area along with longitudinal and cross sectional profiles of the river and levee obtained from digital elevation model are used in the hydrological analysis for assessment of flood. To mitigate the impact of floods, the strategy involves the establishment of reservoirs upstream. Leveraging satellite data, optimal locations for water storage are identified. This approach presents a dual opportunity to not only alleviate flood risks but also catalyze the implementation of pumped storage hydropower initiatives. This holistic approach addresses environmental challenges while championing sustainable energy solutions.

**Keywords :** flood mitigation, levee, remote sensing, satellite imagery analysis, sustainable energy solutions

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