



Impact assessment of structural barriers and flow regulation on the Ganga River morphology and ecology

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The Ganga-Brahmaputra river system in the Himalayan Foreland supports diverse aquatic fauna. Decades of flow regulation through dams and barrages have affected their habitat suitability. To evaluate the impacts of large barrages on the morphology and habitat ecology we studied two different reaches (middle and lower) of the Ganga River. These reaches are the habitat of the endangered Ganga River dolphin (*Platanista gangetica*). In a reach in the middle Ganga between Bijnor and Narora barrage, a reported rise in dolphin population has been documented. In contrast, near the Farakka barrage in the lower reach of the Ganga River, a significant decline in the dolphin population has been observed.

We use Corona and time-series Landsat satellite images along with flow discharge data to assess the morphological and ecological impact of the barrages. In middle Ganga, the dolphin habitat is isolated between the Bijnor and Narora barrage where the minimum flow is available throughout the year for the dolphins to thrive. On the other hand, in the lower Ganga, contrasting impacts are observed in the proximity (upstream/downstream) of the Farakka barrage. In the downstream, reduction in water (by one-third in the pre-monsoon discharge) and sediment discharge has decoupled the channel belt to its floodplain resulting in a loss of lateral connectivity. The presence of minimum flow between the Bijnor and Narora barrage has aided the dolphin population rise while the loss of lateral connectivity and excess siltation at the Farakka barrage has made the river reach unsuitable for habitation.