

VIBRANT GANGA



भारतीय वन्यजीव संस्थान
Wildlife Institute of India



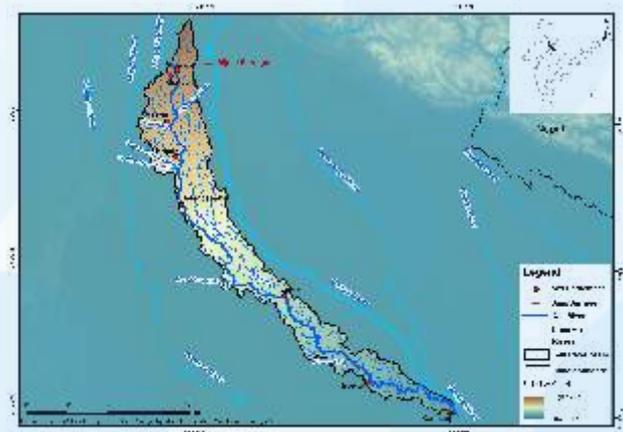
Kali

GENERAL INFORMATION

- Kali (East Kali) River, is a right-bank tributary of the Ganga River and originates at Antwara village in Muzaffarnagar district in Uttar Pradesh.
- The river flows for about 604 km through Muzaffarnagar, Meerut, Hapur, Bulandshahr, Aligarh, Hathras, Kasganj, Etah, Mainpuri, Farrukhabad, and Kannauj in Uttar Pradesh.
- It confluences with the Ganga River at Mehndi Ghat in Kannauj.
- Kali River basin spans an area of about 9,612.91 km² (Figure 1).
- The basin lies in the Gangetic Plain (Upper Gangetic Plains - 7A) biogeographic zone.
- Kali River, situated in the Ganga–Yamuna interfluvium, flows through approximately 380 m thick Quaternary fluvial deposits composed of sand, clay, and kankar. The river overlies the Vindhyan basement rocks and displays a sinuous, channel pattern.
- Kali basin experiences a humid subtropical climate characterized by three distinct seasons: an extremely hot summer, a cold winter, and a rainy season.
- Nim River is a seasonal tributary of the Kali River.

- The population density along the river is 985 persons/km².
- Decadal LULC transitions in the Kali basin (2008–09 to 2018–19) recorded increases in rabi crop by 8.53%, built-up areas by 0.94%, and plantation by 0.06%. In contrast, reduction was detected in double/triple crop by 6.39%, wasteland by 1.66%, kharif crop by 0.63%, waterbodies by 0.25% and fallow land by 0.6%. No change detected in deciduous forest, scrub forest and grassland (Figures 2a and 2b).

Figure 1: Map of Kali River basin



BIODIVERSITY VALUE

- Kali basin is dominated by non-forest areas (97.53%), followed by open forest (1.9%), and moderately dense forest (0.57%) (Figure 3).
- The basin comprises three forest types: Tropical Moist Deciduous, Tropical Dry Deciduous, and Tropical Thorn Forests. Moist deciduous patches formerly supported *Shorea robusta*, *Tectona grandis*, *Dalbergia sissoo*, and *Bambusa* spp. Tropical dry deciduous forest is dominated by *Acacia nilotica*, *Acacia catechu*, *Boswellia serrata*, *Tamarix* spp., *Ziziphus* shrubs, and *Cenchrus ciliaris* grasses. Drier tracts exhibit tropical thorn forests characterized by *Prosopis juliflora*, *Senegalia senegal*, *Capparis decidua*, and *Carissa carandas*.
- 28 species of mammals, including Endangered hog deer (*Axis porcinus*), Vulnerable fishing cat (*Prionailurus viverrinus*), swamp deer (*Rucervus duvaucelii*), smooth-coated otter (*Lutrogale perspicillata*) have been documented from the Hastinapur Wildlife Sanctuary, located in the basin.
- 230 species of birds have been documented from the Hastinapur Wildlife Sanctuary, including Critically Endangered red-headed vulture (*Sarcogyps calvus*), Endangered Indian skimmer (*Rynchops albicollis*), and black-bellied tern (*Sterna acuticauda*), and Vulnerable sarus crane (*Grus antigone*) and river tern (*Sterna aurantia*).
- 25 species of reptiles have been recorded from the Hastinapur Wildlife Sanctuary, including the Critically Endangered gharial (*Gavialis gangeticus*), three-striped roofed turtle (*Batagur dhongoka*) and Vulnerable mugger (*Crocodylus palustris*).
- Two fish species *Labeo gonius* and *Heteropneustes fossilis* have been documented from the Kali River.

Figure 2a: LULC map of Kali River basin (2008-09)

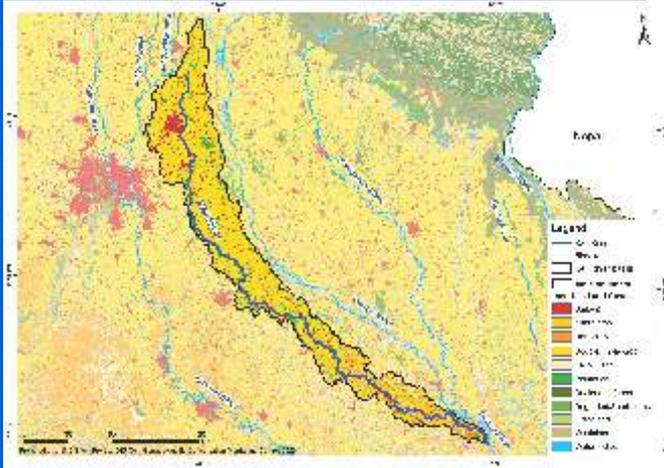


Figure 2b: LULC map of Kali River basin (2018-19)

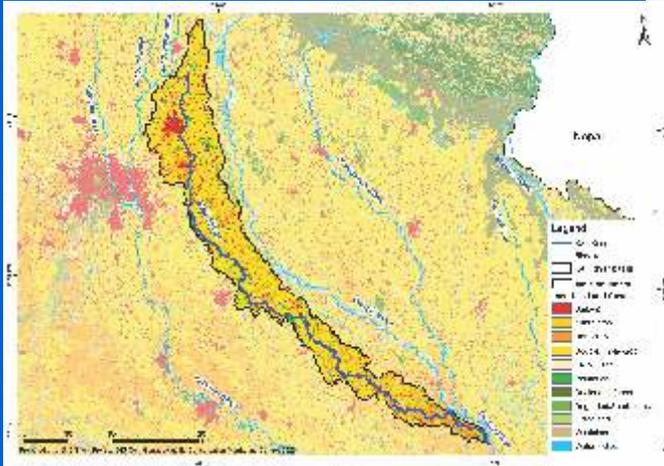
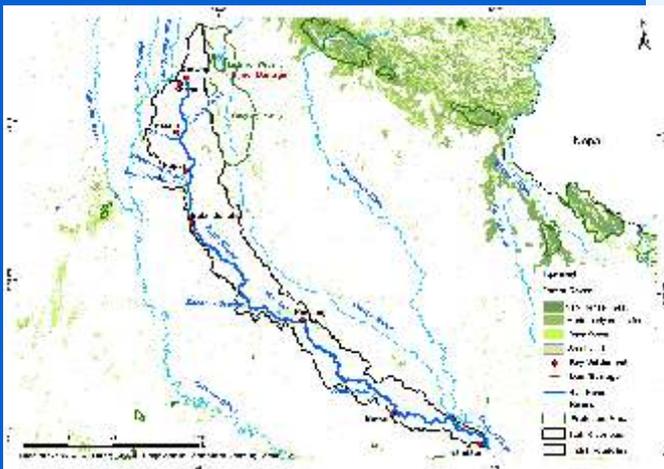


Figure 3: Forest cover of Kali River basin (2019)



CONSERVATION SIGNIFICANCE

Critically Endangered

Reptile

Gharial *Gavialis gangeticus*
(Gmelin in Linnaeus, 1789)

Three-striped roofed turtle *Batagur dhongoka*
(Gray, 1832)

Elongated tortoise *Indotestudo elongata*
(Blyth, 1853)

Endangered

Avifauna

Indian skimmer *Rynchops albicollis*
(Swainson, 1838)

Black-bellied tern *Sterna acuticauda* (Gray, 1832)

Reptile

Spotted pond turtle *Geoclemys hamiltonii*
(Gray, 1830)

Crowned river turtle *Hardella thurjii* (Gray, 1831)

Indian softshell turtle *Nilssonina gangetica*
(Cuvier, 1825)

Indian peacock softshell turtle *Nilssonina hurum*
(Gray, 1830)

Indian narrow-headed softshell turtle *Chitra indica*
(Gray, 1830)

Vulnerable

Mammal

Fishing cat *Prionailurus viverrinus* (Bennett, 1833)

Swamp deer *Rucervus duvaucelii* (G. Cuvier, 1823)

Smooth-coated otter *Lutrogale perspicillata*
(I. Geoffroy Saint-Hilaire, 1826)

Avifauna

Sarus crane *Grus antigone* (Linnaeus, 1758)

River tern *Sterna aurantia* (Gray, 1831)

Reptile

Mugger *Crocodylus palustris* (Lesson, 1831)

Indian roofed turtle *Pangshura tecta* (Gray, 1830)

Indian flapshell turtle *Lissemys punctata*
(Lacépède, 1788)

Key Protected Areas

Hastinapur Wildlife Sanctuary

DRIVERS OF RIVERSCAPE CHANGE

- Kali River receives heavy pollution inputs from 26 drains and wastewater from ~94 industries across Muzaffarnagar, Meerut, Hapur, and Bulandshahr, causing severe water-quality degradation despite periodic dilution from the Upper and Lower Ganga Canals, and resulting in degraded aquatic habitats.
- Industrial effluents also introduce chlorinated organics, suspended solids, phenols, mineral oils, and other hard-to-treat, carcinogenic pollutants into the river system.
- Contaminated river water infiltrates the subsurface, degrading groundwater quality in surrounding villages and rendering it unsafe for drinking, with associated public health risks.
- The absence of functional forest cover in a predominantly agricultural basin increases pesticide and heavy-metal runoff, while unplanned construction on riverbeds and wetlands further degrades channel integrity and accelerates rivercourse loss.

Fishing cat (*Prionailurus viverrinus*) | Source: Cloudtail the Snow Leopard



INTERESTING FACTS

- There is historical evidence to suggest that Kali River East and West were a united river in the medieval times, and the separation of the two is a result of human interventions during the period of Firuz Shah Tughlaq (14th century), who constructed a canal to draw water from Kali to Hindon, and the colonial era, with the construction of the Upper Ganga Canal (mid 1800s).
- Presently the West Kali river joins the Hindon River, a tributary of the Yamuna River. While, the East Kali River originates about 10 km East of the West Kali River, near Antwara village in Muzzafarnagar district.
- The Kali River flowing between the upper Ganga-Yamuna doab, was a prominent river in the medieval times, and carried significant water flow.
- The River finds its mention in the travelogue of Ibn Battuta as "Ab-i Siyah", which means the Black River. The East Kali River is also known as "Nagin".



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