

VIBRANT GANGA



 भारतीय वन्यजीव संस्थान
Wildlife Institute of India



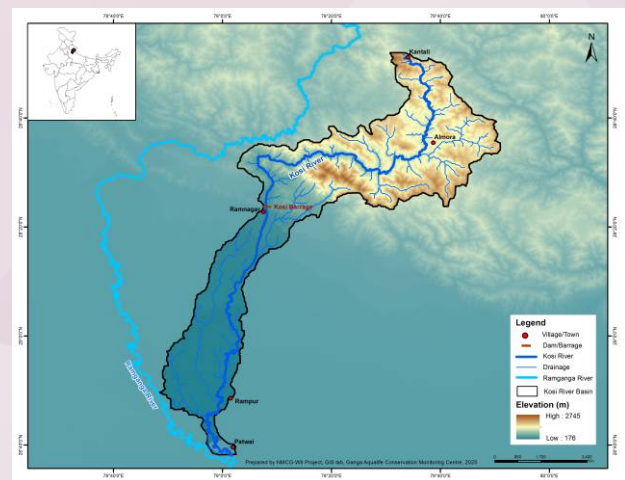
Kosi

GENERAL INFORMATION

- Kosi River, a tributary of the Ramganga River, is a spring-fed and rainfed river that originates from Koshimool (also referred to as Dharapani Dhar; 2758 m asl) near Kausani (Bageshwar district, Uttarakhand).
- It traverses a length of about 240 km, through the districts of Bageshwar, Almora, Nainital and Udham Singh Nagar in Uttarakhand, and Rampur in Uttar Pradesh.
- It enters the Terai plains at Ramnagar (Nainital district), and joins the Ramganga River near Chamraul village (Rampur district).
- Kosi River basin has an area of around 3,420 km² (Figure 1).
- The basin lies within two biogeographic zones, namely Himalaya (West Himalaya – 2B) and Gangetic Plain (Upper Gangetic Plains – 7A).
- Climate in the basin varies from warm-temperate to sub-tropical highland climate with distinct seasons in the upper reaches, and sub-humid subtropical climate in the lower reaches.
- Kosi basin is dominated by a dendritic drainage pattern.
- Suyal, Ramgad, Kuchgad and Dabka are the key tributaries of Kosi River.

- The population density along the river is 400.26 persons/km².
- Decadal LULC transitions in the Kosi basin (2008-09 to 2018-19) witnessed an increase in area under kharif crop (5.98%), and decrease in wasteland (-3.37%), current fallow (-3.13%) and double/triple crop (-1.17%). Area under rabi crop (0.76%), waterbodies (0.74%), built-up (0.08%), plantation (0.08%), evergreen forest (0.07%), degraded/scrub forest (0%) and deciduous forest (-0.04%) has remained largely stable with marginal to no changes (Figures 2a and 2b).

Figure 1: Map of Kosi River basin



BIODIVERSITY VALUE

- Kosi basin in Uttarakhand is dominated by non-forest areas (59.48%), followed by moderately dense forest (21.94%), very dense forest (9.35%), open forest (9.03%), and scrubland (0.2%) (Figure 3).
- Upper Kosi basin is dominated by Subtropical Pine Forests characterised by chir pine (*Pinus roxburghii*), and Himalayan Moist Temperate Forests represented by oak (*Quercus leucotrichophora*); while the lower basin is dominated by Tropical Moist Deciduous Forests, with sal (*Shorea robusta*) and rohini (*Mallotus philippensis*) forming the characteristic Terai vegetation.
- The basin lies with the Western Terai Arc Landscape and Corbett Tiger Reserve, and drains the Ramnagar Forest Division. These support apex predators such as the Endangered tiger (*Panthera tigris*) and Vulnerable leopard (*Panthera pardus*), key prey species like the Vulnerable sambar (*Rusa unicolor*), chital (*Axis axis*), and wild boar (*Sus scrofa*), and other iconic species like the Endangered Asian elephant (*Elephas maximus*). Ramnagar Forest Division hosts 23 mammalian species.
- 254 avifaunal species have been recorded from the Ramnagar Forest Division, including the Vulnerable common pochard (*Aythya ferina*), great slaty woodpecker (*Mulleripicus pulverulentus*), and great hornbill (*Buceros bicornis*).
- 105 fish species (7 orders and 24 families) have been documented from the river, including the Vulnerable snowtrout (*Schizothorax richardsonii*) and *Wallago attu*.

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

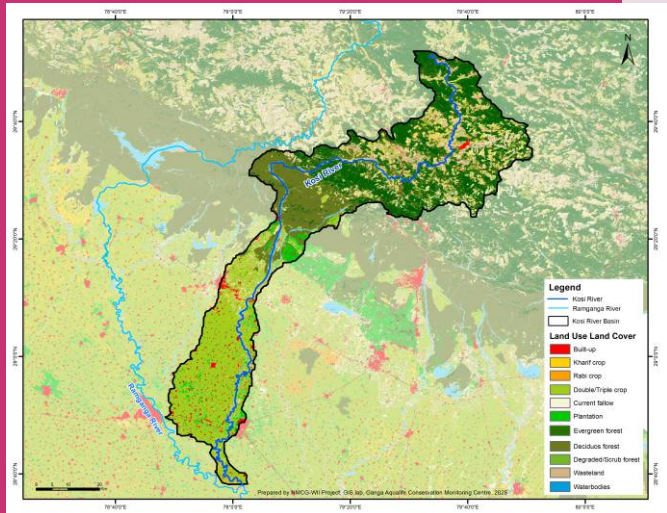


Figure 2b: LULC map of Kosi River basin (2018-19)

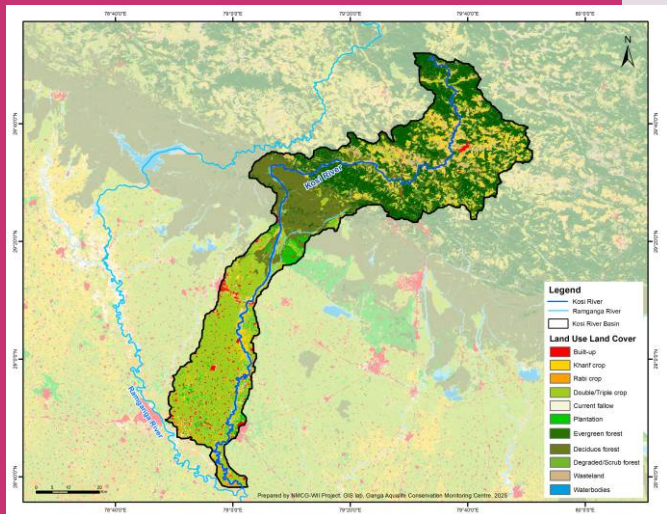
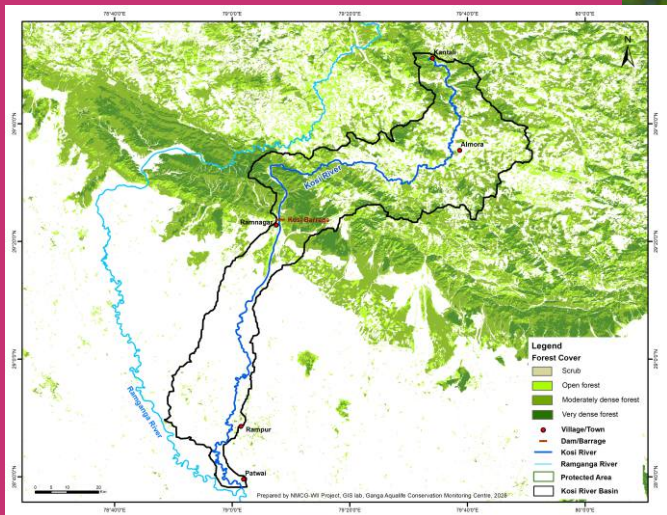


Figure 3: Forest cover of Kosi River basin (2019)



CONSERVATION SIGNIFICANCE

ENDANGERED

Fish

Golden mahseer *Tor putitora* (Hamilton, 1822)

Glyptothorax madraspatanus (Day, 1873)

VULNERABLE

Fish

Dark mahseer *Naziritor chelynoides* (McClelland, 1839)

Hill trout *Schizothorax plagiostomus* (Heckel, 1838)

Snowtrout *Schizothorax richardsonii* (Gray, 1832)

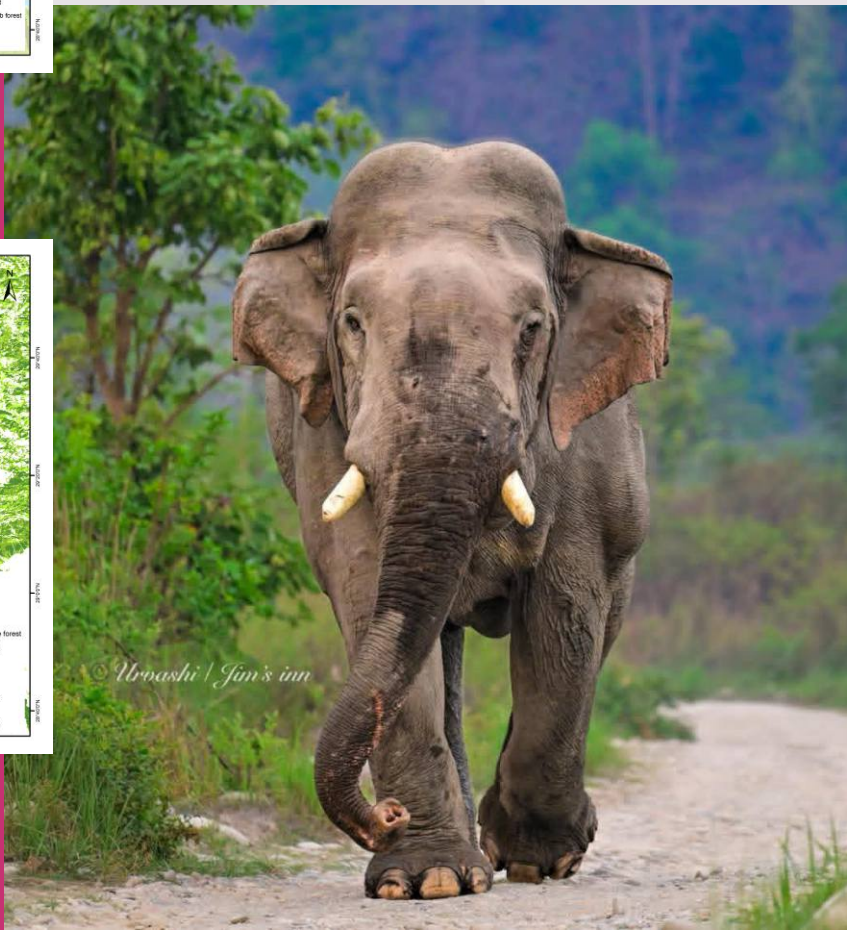
Wallago attu (Bloch and Schneider, 1801)

Goonch *Bagarius bagarius* (Hamilton, 1822)

KEY PROTECTED AREAS

Jim Corbett National Park

Sitabani Conservation Reserve



DRIVERS OF RIVERSCAPE CHANGE

- Unregulated sand and boulder mining in the districts of Nainital and Udham Singh Nagar in Uttarakhand, and Rampur in Uttar Pradesh has degraded the riverbed, destroyed fish spawning grounds, destabilised channel morphology, and lowered the groundwater table.
- Rapid infrastructure development, including roads, hotels and settlements, coupled with hill-cutting and deforestation, has altered natural drainage patterns, increased soil erosion and led to higher silt loads in the river.
- Riverbed encroachment driven by agricultural expansion, urbanisation and sand mining has led to the depletion and degradation of critical biodiversity habitats.
- Intense monsoon flows, particularly in the Corbett stretch between Mohan and Dhikuli, generate powerful and erratic floods that erode riverbanks, remove riparian vegetation, reshape landforms and disrupt wildlife habitats.
- Construction of major barrages, including the Kosi Barrage at Ramnagar (Nainital district, Uttarakhand) and the Lalpur Barrage in Rampur district (Uttar Pradesh), diverts large volumes of water for irrigation, and has significantly impacted the river's natural flow regime.
- Untreated industrial effluents and sewage discharges into the river, particularly from the urban centres of Kashipur (Uttarakhand) and Rampur (Uttar Pradesh), have significantly degraded water quality.

INTERESTING FACTS

- Garjia Devi Temple, near Ramnagar on the outskirts of Jim Corbett National Park, stands atop a large rock in the Kosi River. It was relocated from the riverbank due to flooding and erosion. Local legend attributes its origin to mark Goddess Garjiya's (an incarnation of Goddess Parvati) victory over the demon Garjna.
- Rudrahari Mahadev Temple, an ancient cave shrine on the banks of the Kosi River, in Kausani, is believed to mark the meditation site of Rishi Kaushik and is situated near the scenic Rudradhari Falls and Caves, amid terraced fields and dense pine forests.
- Kashipur is a historical town situated on the banks of the Kosi River in the Terai region. It was known as Govishan during the time of Harsha (606–647 CE) and was visited by the Chinese pilgrim Yuan-Chwang. It is believed to have ancient roots linked to the Indian epics of Ramayana and Mahabharata, serving as the Tapobhumi of Guru Dronacharya, and later as a centre of Buddhist culture. Excavations by the Archaeological Survey of India have revealed remains of a 6th century Panchayatan temple and other artefacts. The modern town is named after Pandit Kashinath, an official of the Chand rulers of Kumaon, under whom Kashipur developed after 1588 CE.
- Terai Arc Landscape is a transboundary, globally recognised priority region for tiger conservation and among the 200 globally important eco-regions due to its fairly intact large mammal assemblages. In India, the Terai Arc Landscape extends from the Yamuna River in the west to Valmiki Tiger Reserve in Bihar in the east, and spans about 42,700 km².



National Mission for Clean Ganga,
Ministry of Jal Shakti,
Department of Water Resources,
River Development and Ganga Rejuvenation,
Major Dhyani Chand Stadium, New Delhi - 110001

GACMC/NCCR

Ganga Aqualife Conservation
Monitoring Centre/
National Centre for River Research
Wildlife Institute of India, Dehradun
nmcg@wii.gov.in



भारतीय वन्यजीव संस्थान
Wildlife Institute of India
P.O. Box #18, Chandrabani
Dehradun - 248002, Uttarakhand
wii@wii.gov.in