Ganga

Newsletter No. 88; IRBMS
January, 2026

Teesta in North Sikkim

Commentary

In January 2026, the IRBMS team participated in a field tour of the Upper Teesta Basin, organized by Uttarbanga Bon-Jan Shramajibi Mancha. Following the study, IRBMS complied the present status of the hydel power projects and different disaster events like earthquakes, landslides and GLOF. Based on the same, IRBMS prepared a new Teesta Basin map documenting recent development activities as the earlier version of such map was prepared by SANDRP in 2011. The map highlights that since 2011 more development projects were commissioned and proposed in the disaster prone, ecologically sensitive Sikkim Himalayas. Many of these infrastructure projects often disregard the fragile Himalayan ecosystem. Dense forests, biodiversity, and wildlife have been side-lined in favour of construction with blasting, despite the region's high seismic risk. We noticed that large projects like Teesta Phase III dam in Chungtham, were washed away in 2023 GLOF and contributed to further disasters in downstream devastating the town and surrounding structures. Despite repeated failures, additional hydroelectric projects are planned along the Teesta. While intended to improve local livelihoods, these initiatives ignore regional ecological realities and ultimately increase risks for communities, biodiversity, and wildlife. Due to space constraints, the second part of the Aravalli study has not been included in this newsletter.

NEWS

Teesta River: Source of Green Energy or Cradle of Natural Disaster?

In January 2026 a tour was organized in Upper Teesta Basin by ***Uttarbanga Bon-Jan Shramajibi Mancha*** lead by Mr. Soumitra Ghosh with active participation of the ***Integrated River Basin Management Society (IRBMS)*** team.

The mighty trans-boundary Teesta River, winding through India and Bangladesh, is the life line of nearly 5 million people. From its origin at the Pauhunri glacier (7,128 m m.s.l) in the snowcapped Himalaya to its confluence with the Brahmaputra in Bangladesh (40 m m.s.l), the river drops nearly 7 km in height over its 414 km journey. This dramatic descent creates a steep gradient in Sikkim and West Bengal, offering immense hydropower potential while simultaneously nesting a landscape prone to catastrophic natural disasters.

The river flows for approximately 172 km through the high mountainous regions of Darjeeling and Sikkim, 98 km through the West Bengal plains, and 134 km through the Bangladesh plain. While 83% of its 12,160 sq Km catchment area is located in India, nearly 50% of the total basin population resides in the Bangladesh portion.

The Hydropower Ambition

The high snow-clad Himalayan glacial mountains, combined with the perennial flow of the Teesta, Rangit, and their numerous tributaries, make Sikkim a primary hub for renewable energy. While the state's per capita consumption remains below the national average, it stands out for having some of the highest per capita power availability in the region.

Historical data from the South Asia Network on Dams, Rivers and People (SANDRP) in 2012 indicated that Sikkim possessed the highest hydropower installed capacity (602 MW) and the largest number of under-construction projects in the Northeast. By March 31, 2024, a study by the Central Electricity Authority highlighted a massive scale of hydro-electricity development:

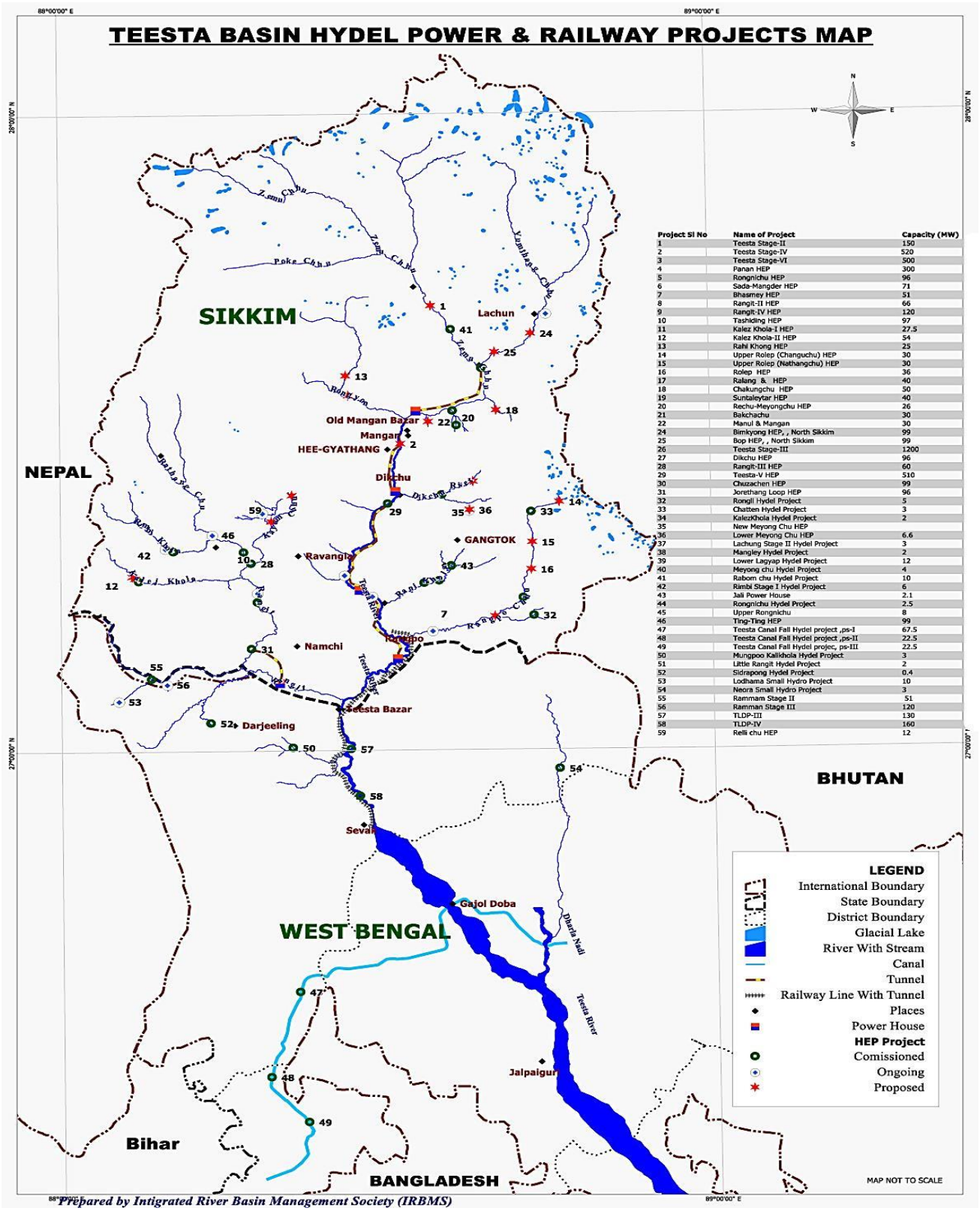
- Identified Capacity: 6,051 MW (for projects above 25 MW).
- Developed: 2,282 MW (37.71%).
- Under Construction: 1,037 MW (17.14%).
- Yet to be Developed: 2,730 MW (45.12%).

The West Bengal portion of the basin also harnesses electricity independently.

Following the tour an urgent need to update the basin map including the new Sikkim railway line project under construction (Map-1).

Our compiled data on Teesta Basin of Sikkim and West Bengal part, Hydel power generation project status are mentioned in Table-1 below;

Teesta Basin Project	No	Capacity in MW	Remarks
Commissioned	29	2798	Teesta Stage III and V projects with total capacity of 1710 MW were damaged in 2023 GLOF, presently under reconstruction.
Ongoing	11	995	
Proposed	19	1737	



Project Sl No	Name of Project	Capacity (MW)
1	Teesta Stage-II	150
2	Teesta Stage-IV	520
3	Teesta Stage-VI	500
4	Panan HEP	300
5	Rongnichu HEP	96
6	Sada-Mangder HEP	71
7	Bhasmey HEP	51
8	Rangit-II HEP	66
9	Rangit-IV HEP	120
10	Tashiding HEP	97
11	Kalez Khola-I HEP	27.5
12	Kalez Khola-II HEP	54
13	Rahi Khong HEP	25
14	Upper Rolep (Changuchu) HEP	30
15	Upper Rolep (Nathangchu) HEP	30
16	Rolep HEP	36
17	Ralang & HEP	40
18	Chakungchu HEP	50
19	Suntaleytar HEP	40
20	Rechu-Meyongchu HEP	26
21	Bakchachu	30
22	Manul & Mangan	30
24	Bimkyong HEP, , North Sikkim	99
25	Bop HEP, , North Sikkim	99
26	Teesta Stage-III	1200
27	Dikchu HEP	96
28	Rangit-III HEP	60
29	Teesta-V HEP	510
30	Chuzachen HEP	99
31	Jorethang Loop HEP	96
32	Rongli Hydel Project	5
33	Chatten Hydel Project	3
34	KelezKhola Hydel Project	2
35	New Meyong Chu HEP	
36	Lower Meyong Chu HEP	6.6
37	Lachung Stage II Hydel Project	3
38	Mangley Hydel Project	2
39	Lower Lagyap Hydel Project	12
40	Meyong chu Hydel Project	4
41	Rabom chu Hydel Project	10
42	Rimbi Stage I Hydel Project	6
43	Jali Power House	2.1
44	Rongnichu Hydel Project	2.5
45	Upper Rongnichu	8
46	Ting-Ting HEP	99
47	Teesta Canal Fall Hydel project ,ps-I	67.5
48	Teesta Canal Fall Hydel project ,ps-II	22.5
49	Teesta Canal Fall Hydel projec, ps-III	22.5
50	Mungpoo Kallikhola Hydel Project	3
51	Little Rangit Hydel Project	2
52	Sidrapong Hydel Project	0.4
53	Lodhama Small Hydro Project	10
54	Neora Small Hydro Project	3
55	Rammam Stage II	51
56	Ramman Stage III	120
57	TLDP-III	130
58	TLDP-IV	160
59	Relli chu HEP	12

Prepared by Intigrated River Basin Management Society (IRBMS)

MAP-1

To update this hydro electricity generation status the team used NHPC documents, Power Department Govt. of Sikkim, WBSEDCL and other reliable sources and SANDRP Teesta Basin Map 2011.

Fragile Landscape: The Earthquake, Landslide, GLOF and Beyond

The forest-clad, biodiversity-rich Sikkim Himalayas are naturally prone to earthquakes, landslides, and floods. However, the acceleration of climate change has introduced more frequent Glacial Lake Outburst Floods (GLOFs). Large-scale hydel development in this disaster-prone upper basin is increasingly impacting fragile biodiversity, while natural disasters simultaneously threaten the viability of these projects.

Continuous Threat of Landslides Hazard:

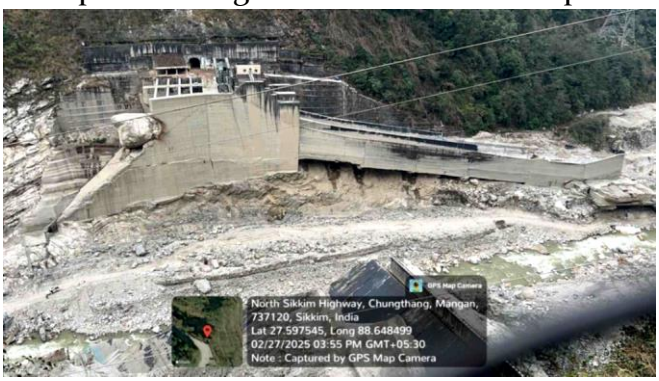
The Upper Teesta Basin witnesses numerous landslide events annually between July and September months. Notable hazardous events have occurred in 2003, 2004, 2005, 2006, 2009, 2011, 2015, and 2024. More than 35,500 people died because of landslide events in Sikkim Himalaya in 1968. Various anthropogenic activities, such as the construction of dams, hydropower projects, roads, railway lines, settlements, etc., triggered landslide vulnerabilities along with natural processes, such as rainfall, snowfall, earthquakes, etc.

The IRBMS team noticed during the tour that in the right bank of Teesta, Lepcha-dominated forest covered Dzongu Protected Area shows higher ecological sensitivity and fewer landslides, while the left bank (along NH-10 and NH-310 A) suffers from high population density, newer construction projects and frequent landslide incidents.

The 2023 GLOF Event

Climate warming is causing mountain glaciers to shrink and glacial lakes to expand. As per October 2023, Monthly Monitoring Report of Glacial Lakes & Water Bodies in the Himalayan Region of Indian River Basins by CWC, there are approximately 24 glacial lakes in the Sikkim Himalayas in which 11 are greater than 50 ha area. Out of these glacial lakes 11 were classified as high risk and very high risk.

In October 2023, the South Lhonak glacial lake burst, sending a massive torrent downstream that washed away the Teesta III dam and Chungthang town, claimed over 20 lives, and affected thousands in downstream. The flood destroyed several bridges and sections of National Highway 10, cutting off access to multiple villages. It also impacted



The 2023 GLOF Damaged Teesta Stage III Dam at Chungthang

heavily on downstream hydel power projects of Sikkim and West Bengal.

The team during tour in 2026 noticed that the impacts of 2023 GLOF remain devastating even today:

- Washed away the Teesta III dam site and the town of Chungthang which is again trying to reorganize.
- Sinking Villages: Since the post 2023 GLOF, the village of Naga Nagmore on the right

bank has been continuously sinking, forcing the evacuation of nearly 300 households .

- Infrastructure Damage: In August 2024, a major landslide near Balutar caused extensive destruction to the 510 MW NHPC Teesta-V hydropower station.
- Huge sediment deposition in Singtham, Rangpo, Kalijhora, and in NHPC Teesta Lower Dam reservoirs of Projects III and IV.

The Seismological Threat

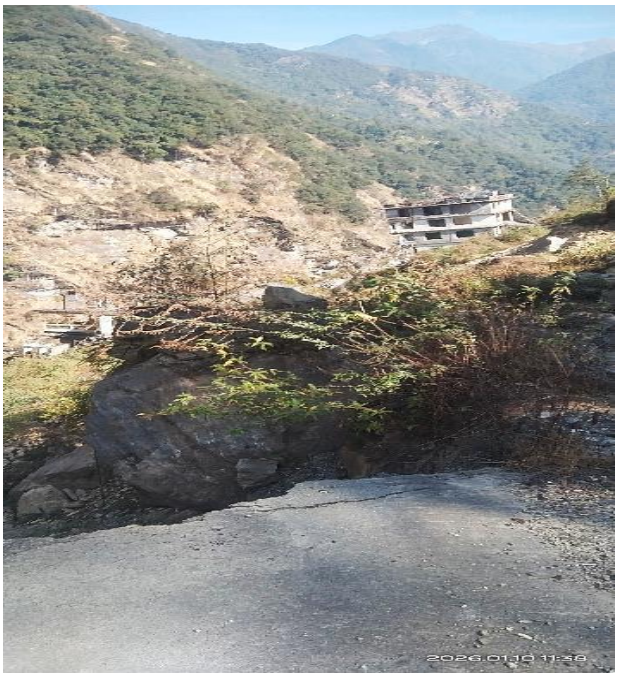
Sikkim lies within **Seismic Zone IV** (Severe Intensity), characterized by frequent shallow-focus micro-earthquakes. The ongoing pressure of the Indian tectonic plate against the Eurasian plate could trigger even larger quakes in the future.

Notable Earthquakes Affected the Teesta Basin	Magnitude (M)
Cachar Earthquake (1869)	7.5
Shillong Plateau Earthquake (1897)	8.7
Bihar-Nepal Border Earthquake (1934)	8.3
Arunachal Pradesh-China Border Earthquake (1950)	8.5
Sikkim Earthquake (2011)	6.8

The basin is intersected by two major structural units: the Main Boundary Thrust (MBT), between the Outer and Lesser Himalaya, and the Main Central Thrust (MCT), between the Lesser and Higher Himalaya. While the MCT is currently considered a dormant feature, the MBT remains a highly active tectonic thrust. The link between the Sikkim Himalaya and the Shillong Plateau via the Goalpara lineament further highlights the region's seismic vulnerability, as this lineament is transverse to the trend of the MBT and remains quite active. USGS data shows that over 65 earthquakes have occurred in and around the Indian part of the basin since 1975. Many of these Hydel power project sites are located in the Upper Tista Basin areas having high GLOF risk and active tectonic thrusts.

A Need for Vigilance

The IRBMS team's 300 km traverse in January 2026 underscores the urgency of updating our geological and environmental understanding of the Teesta Basin. With new infrastructure like the Sikkim-link railway line, the intersection of green energy goals and geological reality have never been more critical. Balancing judicious development with the inherent fragility of this Himalayan ecosystem is essential for the millions who rely on the Teesta as a lifeline.



Sinking Naga Nagmore

(IRBMS Team Acknowledges contribution of other Team Members Ms Tithi Roy, Ms Minakshi Sarkar , Mr Swarup Saha, Prof. Rupak Paul, Mr Arnab Bhattacharya and Ms Mayalmit Lepcha)

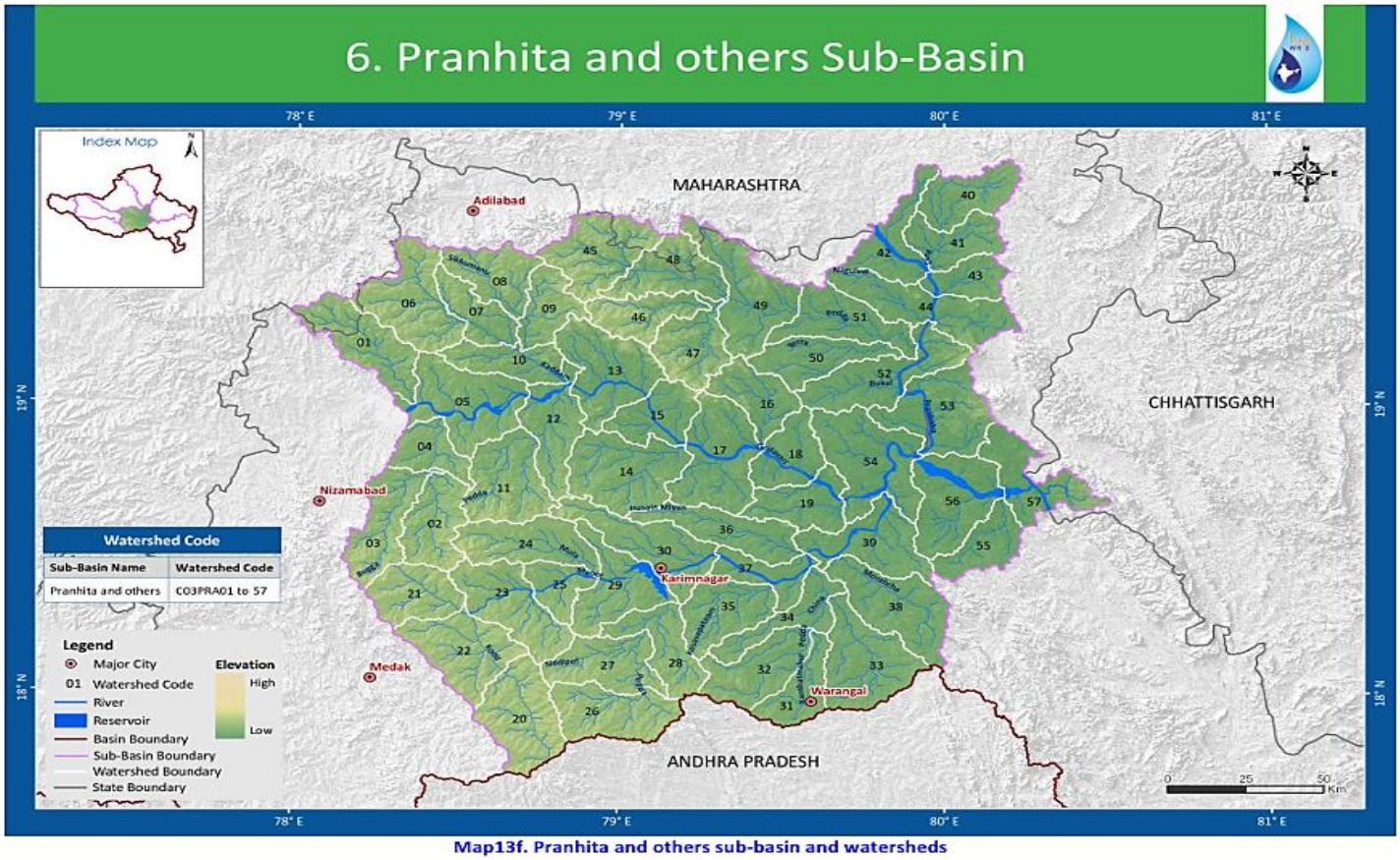
(Source: GSI Maps, USGS Eq data, Power Dept, Govt of Sikim data Sikim Govt, and other publications)

RIVERS OF INDIA

Godavari River
(Part – 10 cntd.)
Pranhita River Sub-basin

The Pranhita–Godavari Valley is one of India's most important coal-bearing regions. The Ramagundam coalfield, part of the Godavari sub-basin, is one of eleven coal belts operated by Singareni Collieries Company Limited (SCCL), which contributes nearly 10% of India's total coal production. Mining in the region is largely open-cast, leading to significant environmental impacts such as vegetation loss, air pollution, groundwater contamination, and major land-use transformation. Expansion of mining activities has driven the growth of associated industries, transport infrastructure, and urban settlements, particularly around Ramagundam, reinforcing the basin's role as a key industrial corridor.

The Pranhita River has no completed major dams or barrages on its main channel as of 2025, largely due to long-standing interstate water-sharing disputes between Maharashtra and Telangana. Several large irrigation projects



Map13f. Pranhita and others sub-basin and watersheds

have been proposed, most notably the Pranhita–Chevella (Dr. B.R. Ambedkar) Lift Irrigation Project, which is stated to divert up to 160 TMC of water through the proposed Tummidihatti Barrage to irrigate drought-prone regions of Telangana. The project, initially conceived in 2007, was revived in 2025 with a revised detailed project report emphasizing gravity-based flow to reduce energy requirements. Additional proposals include the B.R. Ambedkar Pranhita Project near the Wardha–Wainganga confluence, which is stated to aim at irrigation and limited hydropower generation, though progress remains constrained by tribunal rulings and environmental concerns.

Ecologically, the Pranhita basin supports dry deciduous forests dominated by teak and

Blackbuck (Krishna Mrigam)

bamboo, extensive grasslands, wetlands, and seasonal floodplains. The Pranhita Wildlife Sanctuary harbors diverse biodiversity, including over 150 plant species, more than 50 fish species, 20 species of reptiles, numerous mammals such as blackbuck, sloth bears and leopards, and a wide range of resident and migratory birds. These ecosystems play a critical role in sustaining agriculture, fisheries, and groundwater recharge but are increasingly threatened by deforestation, mining, and altered river flows.

Socio-economically, the river supports agriculture, small-scale fisheries, and emerging industrial activities, particularly in Telangana. Seasonal fisheries provide supplementary income to local communities, while proposed irrigation projects are stated to be expected to significantly enhance agricultural productivity in drought-prone districts. The Pranahita River has quietly sustained around 1,000 fishing families from border villages of Maharashtra for nearly five decades, providing them with a vital livelihood despite harsh living conditions. Every year from October to June, fishermen from Gadchiroli district migrate to the riverbed, setting up temporary huts and enduring extreme weather while relying on traditional fishing practices. Men fish mostly at night while women manage households and process fish, which are sold to nearby markets in Telangana and Maharashtra. Earning about ₹500–₹1,000 a day, these families depend entirely on the river as they own no agricultural land, yet they struggle with rising costs and the

A woman of the piscator colony is busy in chopping fish on the Pranahita riverbed near Devalamarri village of Aheri block, Maharashtra.

lack of government welfare support.

The basin also holds religious and cultural importance, hosting the Pushkaram festival every twelve years and encompassing the sacred Triveni Sangam at Kaleshwaram (near the Kaleshwara Mukteswara Swamy Temple), Jayashankar Bhupalpally district, Telengana.

The Pranhita basin is highly prone to natural disasters, especially floods during intense monsoon rainfall. Severe crop damage was reported in 2024 and 2025 due to flood in districts such as Komaram Bheem Asifabad and Mancherial, with river levels crossing danger marks at Tummidihatti and affecting downstream areas near Medigadda. Cyclonic rainfall events, high sediment loads, and human-induced changes in land use and river regulation have amplified flood risks, highlighting the need for integrated basin management.

In July 2024 after the monsoon set in, it is stated that the Medigadda barrage in Telangana became the first structure under the Kaleshwaram lift irrigation scheme to witness a major surge in Godavari flows, crossing 3 lakh cusecs to 14 lakh cusecs within only three days, largely due to inflows from the Pranahita rather than the main Godavari channel. The flow recorded as about 26 tmc ft of water per day was enough to fill major Hyderabad reservoirs multiple times and potentially irrigate large tracts of land, but water cannot be stored at Medigadda following last year's structural damage and the removal of a stuck gate. Similar but smaller leaks were earlier reported at the Annaram and Sundilla barrages, leading experts to advise against storing water at all three barrages until protective measures are finalized.

Structural Damage on Medigadda Barrage

Overall, the Pranhita River basin represents a region of immense agricultural, industrial, and mineral importance, underpinned by complex geology and dynamic land-use changes. While it offers substantial potential for irrigation and economic development, unregulated mining, deforestation, hydrological extremes, and unresolved interstate water conflicts pose serious challenges to its long-term environmental and socio-economic sustainability.

Source:

- *Ministry of water Resources, Govt. of India,*
- *Godavari Basin. - Watershed Atlas of India.*
- *https://www.ndrdgh.gov.in/*
- *PWD, Maharashtra*
- *The Hindu*
- *Deccan Chronicle*
- *Telengana 360*
- *Telengana Today*

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