

Interbasin Transfer Links in India

What Are They?

Moving water from water-rich basins to water-scarce regions. This is part of India's National River Linking Project (NRLP) a multi-decade national infrastructure plan to support irrigation, drinking water, and hydropower in deficit areas.



India's National River Linking Project

12K–15K
Kilometers of Canals

Extensive network spanning the country

3K
Storage Reservoirs

Critical infrastructure for water management

170B
Cubic Meters Annually

Proposed water transfer volume

\$168B
Estimated Budget

One of world's largest water infrastructure projects



Components include Himalayan (northern rivers) and Peninsular (southern rivers) parts, plus intrastate links. Multiple links at various stages; progressing but not operational (Godavari–Krishna), others under construction (Ken–Betwa). Managed by National Water Development Agency.

Major Projects



➤ Ken–Betwa Link (under construction)

- Moves water from the Ken River (Madhya Pradesh) to the Betwa River (Uttar Pradesh)
- Serves the Bundelkhand region

Other planned links

- Godavari–Krishna via Polavaram right bank canal
- Damanganga–Pinjal
- Par–Tapi–Narmada
- Ganga–Brahmaputra tributary connections

Critical Gaps

Data Quality

Monitoring networks across basins are still weak. Many river systems don't have enough flow measurement stations, especially during monsoon season when it matters most.

Transparency

Trade-offs and downstream impacts aren't always visible to state governments, regulators, and local stakeholders. Decision-making often happens in technical silos.

Integrated Assessment

Models often don't combine surface water, groundwater, and water quality impacts together. This means cumulative effects and environmental impacts get overlooked.

Standardization

Different agencies use different procedures and parameters. Need consistent guidelines across all water resource planners.

Why Advanced Technology Adoption Lags?

It's not that the technology is unavailable—the hesitation is institutional

01

Data gaps first Complex models demand reliable inputs. Since basic monitoring is still being strengthened, agencies are cautious about staking big interbasin investments on sophisticated simulations they can't fully validate.

02

Institutional comfort Simple spreadsheets and rule-of-thumb calculations are easier to defend in administrative and audit processes. Advanced models can expose trade-offs and uncertainties more starkly.

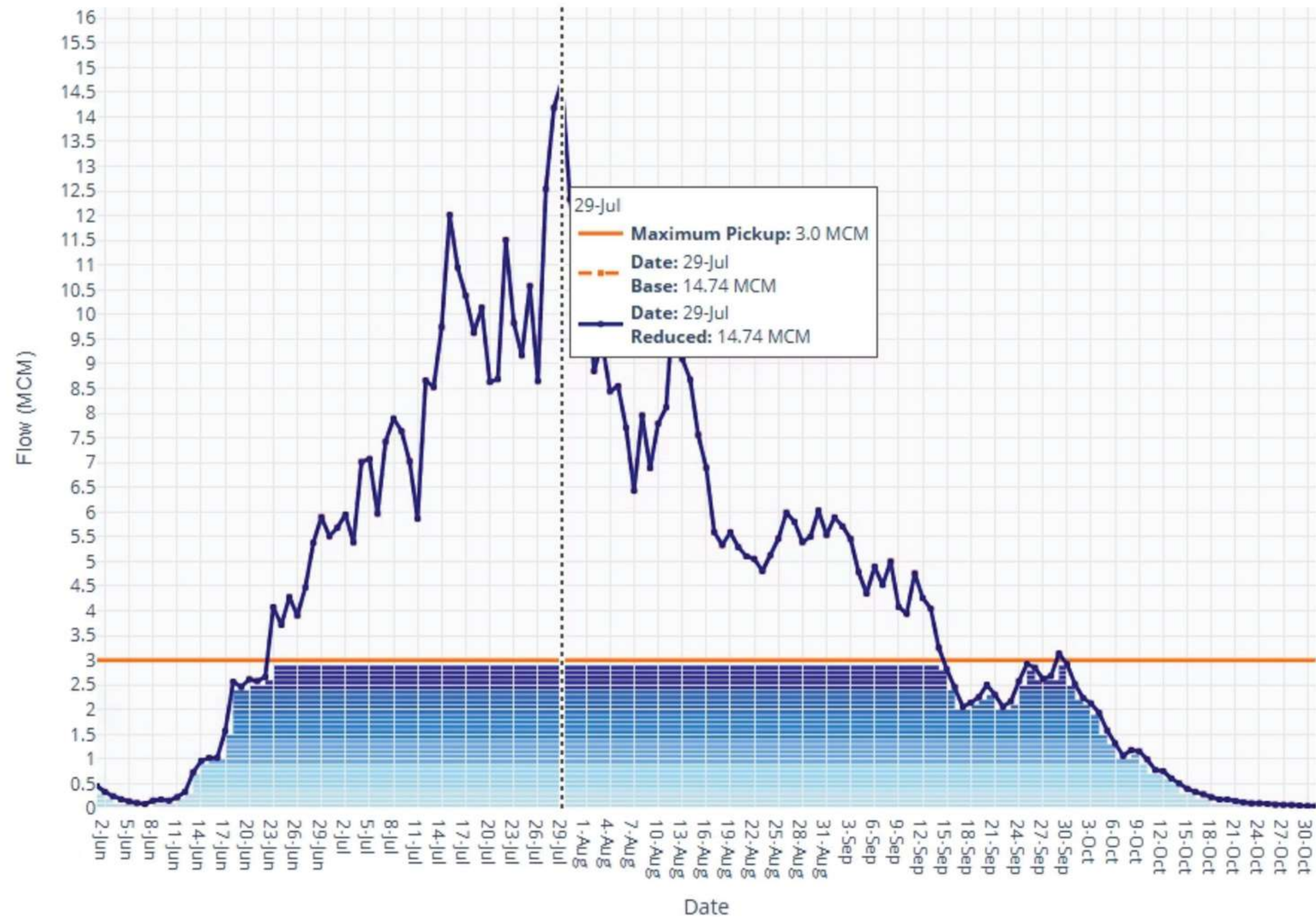
03

Capacity still building National projects like NHP and the NIH Centre of Excellence exist precisely because most agencies are still more comfortable with older, manual methods. Capacity-building programmes are ongoing, not complete.

04

Political sensitivity Complex models show what simple methods hide - who gains water, who loses, what environmental costs exist. Not everyone in the system is ready to own those conversations openly.

The Real Difference from Regression



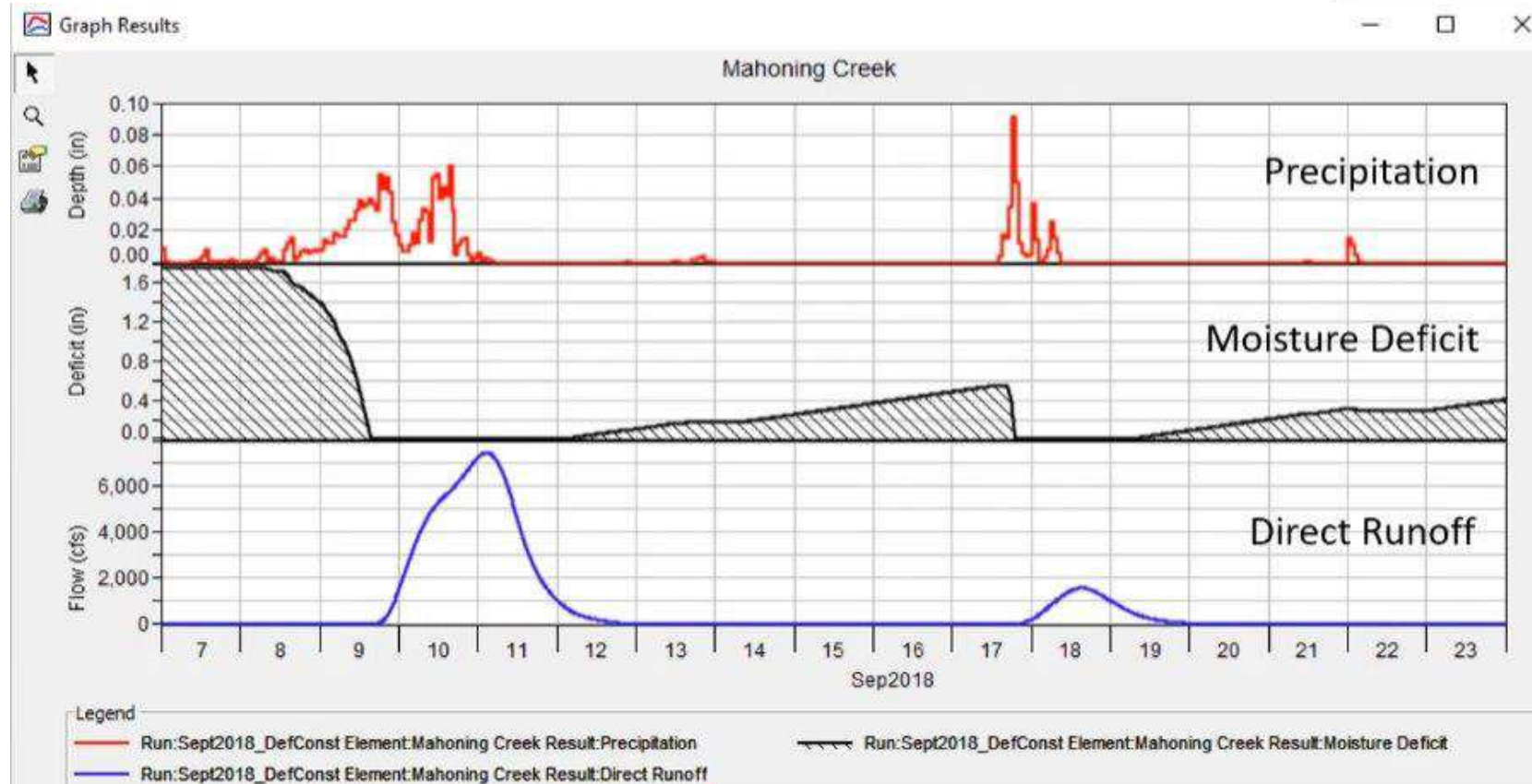
Capacity	Days	Period
3.0	85	Late Jun - Mid Sep, Late Sep - Late Sep
2.9	87	Late Jun - Mid Sep, Late Sep - Late Sep, Late Sep - Late Sep
2.8	89	Late Jun - Mid Sep, Late Sep - Late Sep, Late Sep - Late Sep
2.7	89	Late Jun - Mid Sep, Late Sep - Late Sep, Late Sep - Late Sep
2.6	93	Mid Jun - Mid Jun, Late Jun - Mid Sep, Late Sep - Late Sep
2.5	98	Mid Jun - Mid Jun, Mid Jun - Mid Sep, Mid Sep - Mid Sep, Late Sep - Early Oct
2.4	100	Mid Jun - Mid Sep, Mid Sep - Mid Sep, Late Sep - Early Oct
2.3	101	Mid Jun - Mid Sep, Mid Sep - Late Sep, Late Sep - Early Oct
2.2	103	Mid Jun - Mid Sep, Mid Sep - Late Sep, Late Sep - Early Oct
2.1	106	Mid Jun - Mid Sep, Mid Sep - Late Sep, Late Sep - Early Oct
2.0	108	Mid Jun - Early Oct
1.9	109	Mid Jun - Early Oct
1.8	109	Mid Jun - Early Oct

Example: Deficit Constant Loss Method

Example

Subbasin Loss Options	
Element Name: Subbasin-1	
*Initial Deficit (IN)	0.5
*Maximum Deficit (IN)	8.0
*Constant Rate (IN/HR)	0.25
*Impervious (%)	0.0

Time	Precip (in)	Loss (in)	Excess (in)
0200	0.5	0.5	0.0
0300	0.5	0.25	0.25
0400	1.0	0.25	0.75
0500	0.5	0.25	0.25
0600	0.0	0.0	0.0
0700	0.0	0.0	0.0
0800	0.0	0.0	0.0
0900	0.0	0.0	0.0
1000	0.5	0.45	0.05
1100	0.5	0.25	0.25
1200	0.5	0.25	0.25
1300	0.5	0.25	0.25
1400	0.5	0.25	0.25



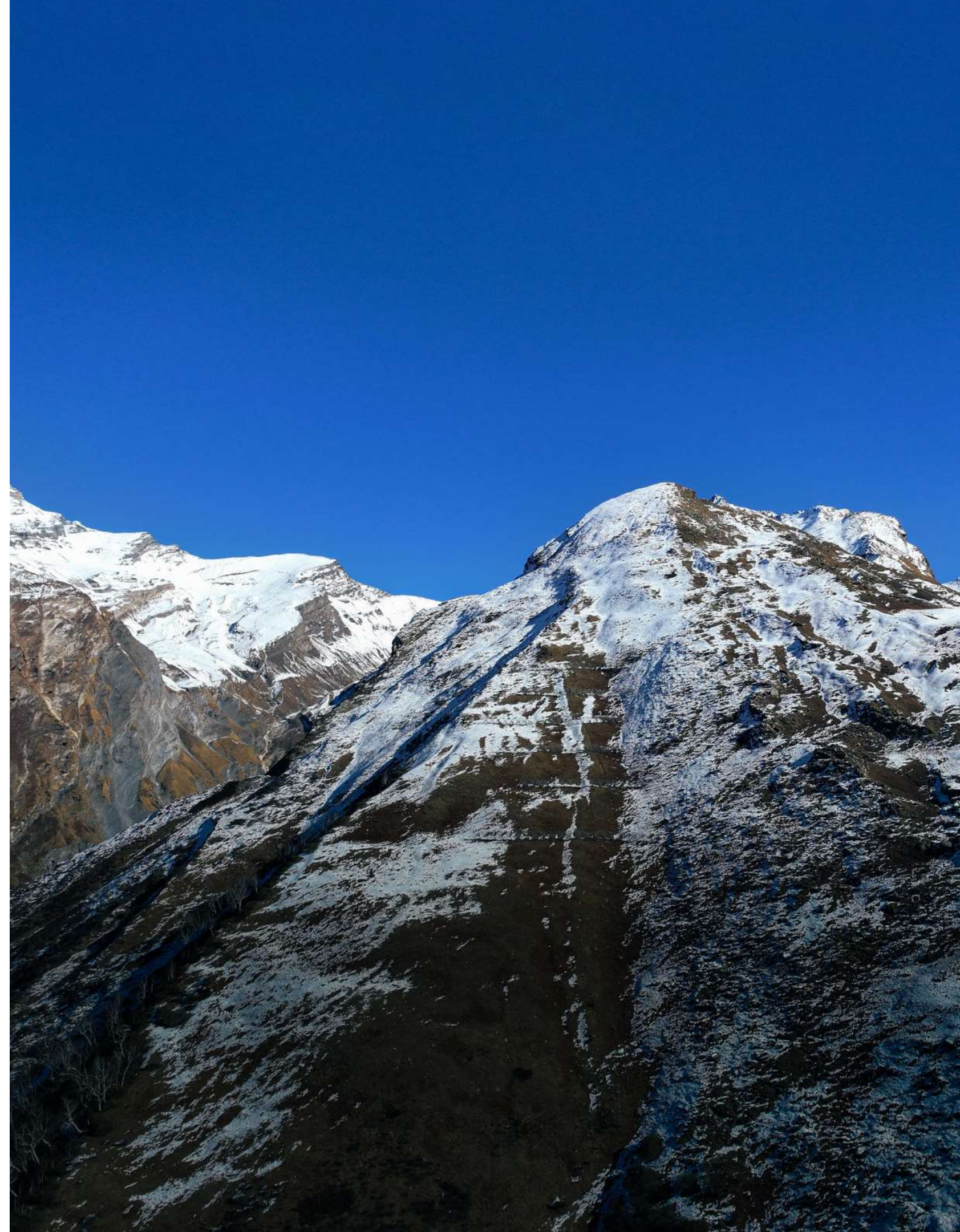
The Bottom Line

Primitive lumped regression equations unmasked the real hydrology in some of the projects in India, and dozens of other projects. Computer simulation reveals daily and seasonal reality – when water actually arrives, what it costs ecologically, and whether the project actually works. The technology exists. What's missing is the institutional will to use it openly and the commitment to base big infrastructure decisions on basin-scale time series analysis, not historical averages and regression lines.

Using simulation upfront costs more in planning but saves orders of magnitude in avoided cost overruns and ecological damage during implementation.

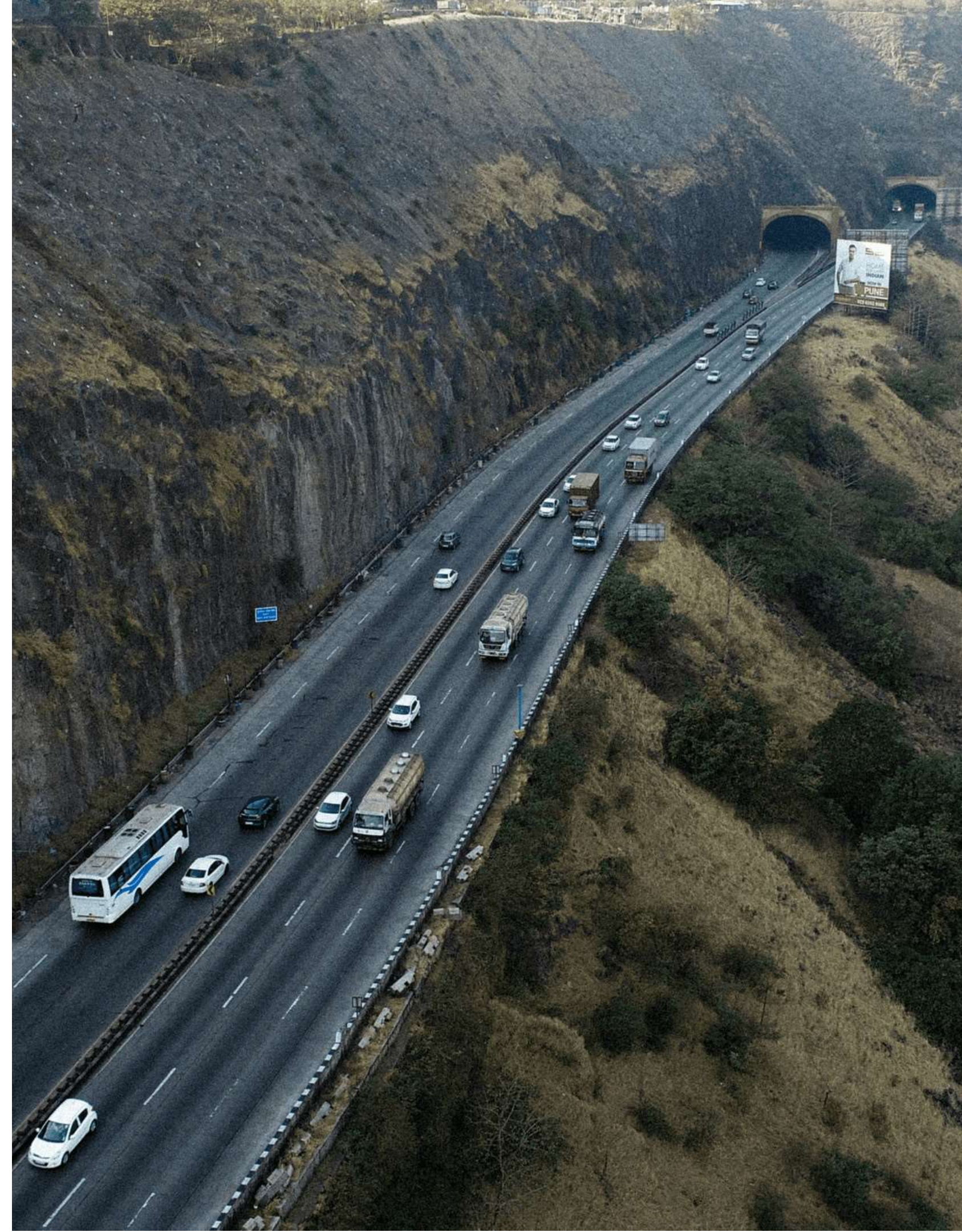
About Us

- 01** PAN INDIA presence & projects executed .
- 02** ISO 9001, 27001, 45001 and CMMI Level 3 certified .
- 03** Offerings include Geohazard & Disaster Mitigation, Landslide & Slope Stability Solutions, Water Resources, Structural Rehabilitation & GIS .
- 04** 32 years old establishment; established to bridge the gap for providing engineering solutions for Geohazard and Disaster Mitigation along with Civil Engineering along GIS turnkey solutions .



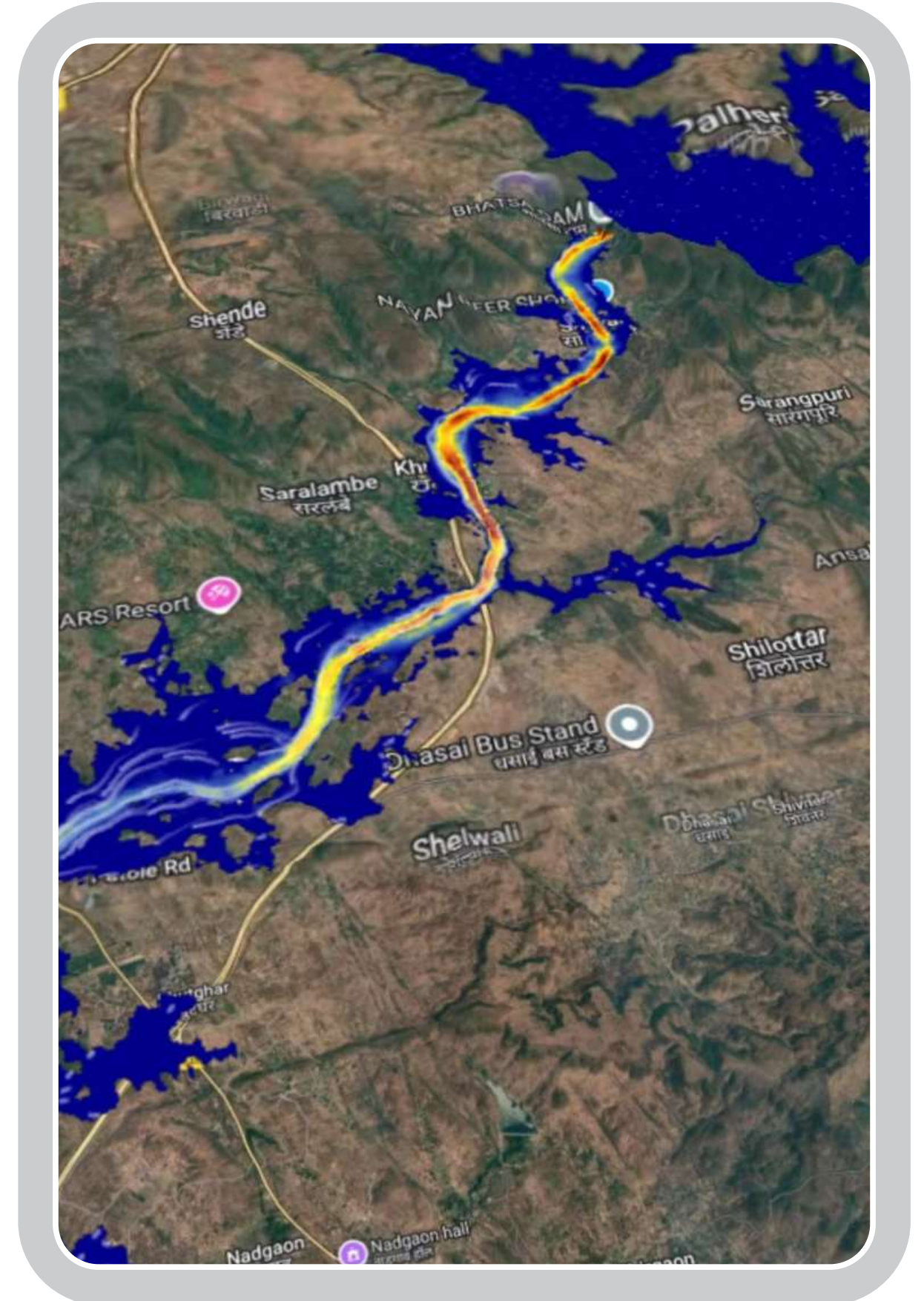
Our USP

- 01** PAN INDIA presence & projects executed .
- 02** In-house team for Aerial Mapping
- 03** Adhered to ETA & FOEN guidelines
- 04** Technology collaboration with European Companies
- 05** Highly skilled workforce with IRATA 1 to 3 certified individuals and support of renowned consultants in the field of Geotechnical and Tunnel Engineering.



Advanced Water Resources Engineering Services

- 01 Flood hazard assessment & modelling
- 02 Dam-break studies
- 03 Hydrological/ Water Balance Modeling
- 04 Emergency Action Plans
- 04 1D/2D Floodplain/Bridge/ Culvert Hydraulic Modelling.



Thank You

We sincerely appreciate your valuable time and attention during this presentation

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