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MARATHON

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Time : 7 PM Onwards in the evening Live

BY ANURAG CHOUBEY SIR

Jal Sanchay Jan Bhagidari Initiative

Introduction

What is the Jal Sanchay Jan Bhagidari Initiative

Full Name

Jal Sanchay Jan Bhagidari Initiative

Launch Date

6 September 2024, in Surat, Gujarat.

Nodal Ministry

Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation)

Type

National–level community-driven campaign for water conservation and groundwater recharge.

Vision, Objective & Scope

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Vision

Build a water-secure India through mass participation and recharge of groundwater.

Objective

Promote community-driven water conservation and groundwater recharge across India, scaling up successful models (like Gujarat's) into national footprint.

Scope

Includes creation and restoration of structures like check-dams, percolation ponds, soak pits, taankas (traditional water tanks), bore-well recharge shafts, integrated with schemes like MGNREGA, AMRUT.

Key Features & Implementation Mechanism

Community Empowerment

Encourages village-level participation, local institutions, "Jan Bhagidari" (people's participation) model.

Recharge Focus

Artificial recharge structures (borewell shafts, percolation ponds) prioritized to augment groundwater.

On-ground works

Construction/rehabilitation of check-dams, gabion structures, gully plugs, step-wells. Desilting works under MGNREGA.

Convergence

Works as a convergence of multiple central schemes and funds — e.g., MGNREGA, AMRUT, "Per Drop More Crop", PMKSY, CAMPA, etc.

Institutional Structure & Stakeholders

1

Ministry of Jal Shakti

Nodal central Ministry responsible for policy and coordination.

2

State Water Resources / Groundwater Departments

Responsible for on-ground planning, execution.

3

Panchayats / Gram Sabhas / Local Community Groups

Engagement for participation & maintenance.

4

MGNREGA / AMRUT / PMKSY

Supporting scheme platforms for funding & implementation.

5

Monitoring & Award Mechanism

Recognition of districts/states via "Jal Sanchay Jan Bhagidari Award" for exemplary community efforts.

Funding, Targets & Major Indicators

Funding Model

Convergent mode — central scheme funds + state shares + community contribution.

Key Target Areas

Rain-fed regions, over-exploited groundwater zones, water-scarce districts.

Indicators include:

The following metrics are tracked to measure success and impact of the initiative.

Related Schemes & Policy Linkages

Scheme	Ministry	Connection
MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act)	Ministry of Rural Development	Use of funds for water-conservation works like desilting, check-dams.
AMRUT (Atal Mission for Rejuvenation & Urban Transformation)	Ministry of Housing & Urban Affairs	Urban water bodies, recharge mechanisms.

Additional Related Schemes

Scheme	Ministry	Connection
Per Drop More Crop – Micro-Irrigation Scheme	Ministry of Agriculture & Farmers Welfare	Efficient water use in irrigation; complements recharge efforts.
PMKSY (Pradhan Mantri Krishi Sinchayee Yojana)	Ministry of Agriculture & Farmers Welfare	Water-saving & efficient irrigation; supports sustainable water resources.
CAMPA (Compensatory Afforestation Fund Management & Planning Authority)	Ministry of Environment, Forest & Climate Change	Funds from forest diversion used for water-conservation works.

Food and Agriculture Organization of the United Nations

BLUE PORTS INITIATIVE

Annual report 2024

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Blue Ports Framework

Blue Ports Framework

Introduction to Blue Ports Framework

- Full Name: Blue Ports Framework
- Launched by: Department of Fisheries (DoF), under the Ministry of Fisheries, Animal Husbandry & Dairying (MoFAHD) and in collaboration with the Food and Agriculture Organization (FAO) of the United Nations.
- Announcement Date: 18 September 2025 (PIB release)

Core Vision & Pilot Harbours

- Aim: To develop smart, integrated, inclusive and environmentally sustainable fishing harbours — blending technology, infrastructure, and community participation.
- Pilot Harbours Approved: Three pilot harbours — Vanakbara (Diu), Jakhau (Gujarat), and Karaikal (Puducherry) — total investment ₹ 369.80 crore.

Strategic Significance

Blue Economy Boost

Boosts India's Blue Economy by upgrading marine infrastructure, enhancing exports, and improving livelihoods of coastal communities.

Sustainable Management

Promotes sustainable fisheries management, reduction of post-harvest losses, and climate-resilient coastal infrastructure.

Maritime Integration

Aligns with broader maritime initiatives (e.g., coastal zone management, harbour modernisation under PMMSY).

Key Stakeholders

01

FAO Partnership

FAO (Food & Agriculture Organization) — supports via Technical Cooperation Programme (TCP).

02

State Governments

Coastal State Governments/UTs — Gujarat, Diu, Puducherry (pilot locations)

03

Local Partners

Fisheries Cooperatives, Harbour Trusts, Ports & Infrastructure agencies

04

Funding Sources

Funding via: Pradhan Mantri Matsya Sampada Yojana (PMMSY) & Fisheries & Aquaculture Infrastructure Development Fund (FIDF) for harbour upgrades.

Implementation Components:

- Harbour modernisation (Check-in/landing centres, cold chain, waste treatment)
- Technology integration (IoT, AI, digital platforms)
- Community participation & social inclusion (fishers, women, local stakeholders)
- Monitoring & traceability systems for post-harvest value chains

Features of the Framework

Smart Infrastructure

Use of IoT sensors, satellite communications, automation, 5G connectivity.

Environmental & Social Sustainability

Rain-water harvesting, sewage & marine-debris treatment, energy-efficient lighting and operations.

Economic Inclusivity

Fishing harbour serves as value-chain hub – enhancing processing, traceability, export potential and livelihoods.

Pilots & Investment

Three pilot harbours approved with ₹ 369.80 crore investment under PMMSY.

Global Best Practices

FAO support, case-study of Port of Vigo (Spain) used for reference.

Funding, Pilot Projects & Key Data

Investment & Locations

- Investment: ₹ 369.80 crore for three pilot harbours.
- Pilot Harbours: Vanakbara (Diu), Jakhau (Gujarat), Karaikal (Puducherry)

Supporting Schemes:

- PMMSY – Central scheme for marine & inland fisheries development.
- FIDF – Fund for fisheries infrastructure.

Technology & Timeline

- Technology Metrics: Real-time data analytics, traceability systems, marine-debris sensors, energy-efficient systems.
- Timeline & Next-Steps: Framework announced in 2025; pilots underway; expansion across coast to follow.

Key Ministries & Current Ministers (as of November 2025)

Ministry / Department	Cabinet Minister (2025)	Role in Blue Ports Framework
Ministry of Fisheries, Animal Husbandry & Dairying (MoFAHD)	Shri Rajeev Ranjan Singh	Parent ministry; policy leadership for fisheries & harbour development.
Department of Fisheries (DoF)	Under Secretary to MoFAHD – Implementation Wing	Nodal department executing the Blue Ports Framework; coordinates with states & FAO.

Additional Ministries & Partners

Ministry / Department	Cabinet Minister (2025)	Role in Blue Ports Framework
Ministry of Earth Sciences (MoES)	Dr. Jitendra Singh	Provides oceanographic, coastal-climate and blue-economy data support.
Ministry of Environment, Forest & Climate Change (MoEFCC)	Shri Bhupender Yadav	Approvals for Coastal Regulation Zone (CRZ) compliance, EIA clearances.
Food and Agriculture Organization (FAO, UN)	Director-General Qu Dongyu	Technical partner — assists India under its Technical Cooperation Programme (TCP).

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Amrit Bharat Station Scheme (ABSS)

Introduction – What is ABSS

Full Name: Amrit Bharat Station Scheme (ABSS)

Launched by: Indian Railways, under the Ministry of Railways

Launch Date: February 2023 (announced)

Objective: Redevelop and modernise around 1,275 railway stations across India with world-class passenger amenities, improved connectivity, blending heritage & local architecture.

Key Stats: >103 stations inaugurated in May 2025 across 18 states.

Key Features & Scope

Scope: Redevelopment of ~1,300 railway stations in phases.

Major Features:

Infrastructure

Modernised façade, platform resurfacing, landscaping.

Accessibility

Improved accessible facilities – lifts, escalators, toilets, LED lighting, Wi-Fi.

Integration

Multi-modal integration: better linkages with buses, metros, local transit.

Design

Station design inspired by local heritage and culture.

Pilot / Implementation: Redevelopment under master-plans per station, executed over phases.

Institutional Framework & Stakeholders

Nodal Ministry

Ministry of Railways

Implementing Agency

Indian Railways & zonal railway divisions

State Governments / Local Bodies

Assist for land access, local connectivity, station area development

Stakeholder Integration

Integration with schemes like "One Station One Product", Make in India, Start-Up India via station area development.

Monitoring & Reporting

Projects tracked via Indian Railways dashboards, budget and progress data published periodically.

Funding, Targets & Key Data

Target Station Count:

~1,275 stations across India.

Recent Achievement:

103 stations inaugurated 22 May 2025 across 18 states; cost above ₹ 1,100 crore.

Funding Pattern:

Under Indian Railways' budgetary allocations; station-area real estate and commercial uses may supplement funding.

Major Goals:

Enhance passenger experience, increase station area commercial utilisation, boost regional connectivity.

Linkages & Related Policies

Scheme/Policy	Nodal Ministry	Connection
One Station One Product (OSOP)	Ministry of Railways	Commercialising station areas via local products.
UDAN-RCS (Regional Connectivity Scheme)	Ministry of Civil Aviation	Multi-modal connectivity improvements at stations.
AMRUT / Smart Cities Mission	Ministry of Housing & Urban Affairs	Urban station environment & surrounding infrastructure.
Make in India / Startup India	Ministry of Commerce & Industry / Ministry of MSME	Boost station area entrepreneurship and facilities.

Acronyms & Key Terms

ABSS – Amrit Bharat Station Scheme

OSOP – One Station One Product

UDAN-RCS – Ude Desh Ka Aam Naagrik – Regional Connectivity Scheme

PWI – Passenger With Impact (context of redeveloping stations)

Divyang – Term used for persons with disabilities (Indian context of accessibility features)

One Station One Product (OSOP) Scheme

(Linked to the Amrit Bharat Station Scheme – ABSS)

One Station One Product (OSOP)

Introduction – What is OSOP Scheme

Full Name: One Station One Product (OSOP).

Launched by: Ministry of Railways, Government of India.

Launch Date: March 2022.

Announced by: Shri Ashwini Vaishnaw, Minister of Railways, Communications & Electronics & IT.

Nodal Ministry: Ministry of Railways (MoR).

Objective:

To promote "Vocal for Local" by providing railway stations as marketing hubs for local artisans, craftsmen, and small businesses to sell regional products directly to passengers.

Tagline: "Ek Station, Ek Utpad" – Every station a platform for local pride.

Objectives & Scope

Key Objective	Description
Promote Local Products	Create awareness and boost sales of indigenous products reflecting each region's cultural identity.
Support MSMEs & Artisans	Provide low-cost retail spaces to self-help groups, artisans, and small entrepreneurs.
Enhance Passenger Experience	Transform railway stations into local experience centres.
Generate Employment	Encourage self-reliant livelihood opportunities under AatmaNirbhar Bharat Abhiyan.

Coverage:

- Implemented across 1,000+ railway stations (as of 2025).
- Pilot project began in 2022 with 156 stations; successful expansion to all zones in 2023–24.

Implementation Mechanism

Nodal Authority: Zonal Railways under Ministry of Railways.

Execution Model:

01

Identification

Local Divisional Railway Managers (DRMs) identify potential stations and products.

02

Allotment

Temporary OSOP stalls/kiosks allotted for 15-day periods on a rotational basis.

03

Registration

Minimal registration fee; priority to SHGs, women entrepreneurs, ODOP (One District One Product) beneficiaries.

Integration & Monitoring

Integration:

- Linked with ABSS (station redevelopment) and Vocal for Local initiative.
- Supported by PM Vishwakarma Scheme and PMEGP (Prime Minister Employment Generation Programme).

Monitoring:

Managed through Indian Railways E-Platform for vendor selection and reporting.

Key Features & Facilities

Space Allotment

Dedicated kiosks near station concourses/platforms.

Product Categories

Handicrafts, textiles, pottery, agro-products, tribal goods, regional cuisines, forest produce, etc.

Operational Tenure

15 days per vendor (rotational model to include more beneficiaries).

Branding Support

Common branding with "Vocal for Local" theme and digital payment facility (UPI-enabled).

No Commission Model

Artisans retain 100% of sales revenue; Railways provides space and branding.

Integration with ABSS

Redeveloped stations under ABSS include permanent OSOP zones.

Achievements & Current Status (as of 2025)

Parameter	Data / Fact
Total OSOP Stalls Established	Over 1,400 kiosks at 1,000+ railway stations.
Top Performing Zones	Southern Railway, Northern Railway, Central Railway.
Beneficiaries	Over 10,000 artisans and SHG members across India.
Sales Generated (2024–25)	Exceeded ₹100 crore in cumulative direct sales.
Flagship Success Stories	Lucknow (Chikan work), Puri (Pattachitra), Varanasi (Banarasi silk), Mysuru (Sandalwood).

Related Initiatives & Linkages

Initiative / Scheme	Ministry / Department	Connection with OSOP
Amrit Bharat Station Scheme (ABSS)	Ministry of Railways	OSOP stalls integrated into redeveloped stations.
One District One Product (ODOP)	Ministry of Commerce & Industry	Source of local product identification.
PM Vishwakarma Scheme	Ministry of MSME	Provides support & tools to artisans participating in OSOP.
PMEGP (Prime Minister Employment Generation Programme)	Ministry of MSME	Financial assistance to small entrepreneurs.
Vocal for Local / AatmaNirbhar Bharat Abhiyan	National initiative	Ideological backbone of OSOP.

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Paramparagat Krishi Vikas Yojana (PKVY)

Traditional Farming Development Scheme

Introduction
What is PKVY?

Full Name: Paramparagat Krishi Vikas Yojana (PKVY)

Meaning: "Traditional Farming Development Scheme"

Launched: 2015–16 (under National Mission on Sustainable Agriculture – NMSA)

Nodal Ministry: Ministry of Agriculture and Farmers Welfare (MoAFW)

Implementing Department: Department of Agriculture and Farmers Welfare (DA&FW)

Current Minister (2025): Shivraj Singh Chouhan

Minister of State: Shobha Karandlaje and Kailash Choudhary

Objective:

To promote organic farming through cluster-based approaches to reduce chemical fertilizer use, improve soil health, and ensure sustainable income for farmers.

Vision and Mission of PKVY

Vision

- To promote "Paramparagat" (traditional & sustainable) agricultural practices.
- To integrate indigenous knowledge, modern organic certification, and market linkages.

Mission Objectives

1

Reduce Dependency

Reduce dependency on chemical inputs.

2

Improve Soil Fertility

Improve soil fertility and biodiversity.

3

Empower Farmers

Empower small and marginal farmers through collective organic farming.

4

Premium Prices

Ensure premium market prices through organic certification.

5

Market Linkage

Link organic produce to "Jaivik Kheti" (National Organic Market).

Key Features of the Scheme

Feature	Details
Cluster Approach	Groups of 20 ha per cluster (≈50 farmers).
Incentive	₹50,000 per hectare for 3 years.
Fund Flow	60:40 (Centre:State) under NMSA.
Training	Farmers trained in composting, crop rotation, biofertilizers.
Certification	Participatory Guarantee System (PGS-India).
Marketing	Branding via Jaivik Kheti portal & FPOs.
Tenure	Initially 2015–18, continued under PKVY 2.0 (2020–26).

Implementation Structure

Nodal Agencies:

- National Centre of Organic Farming (NCOF), Ghaziabad – technical support.
- State Departments of Agriculture – cluster formation & training.
- Regional Councils – oversee certification (PGS-India).
- Farmers Producer Organisations (FPOs) – marketing & aggregation.

Monitoring

National Project Management Unit

Conducted through National Project Management Unit (NPMU).

Integration

Integrated with Soil Health Card and Mission Organic Value Chain Development for North Eastern Region (MOVCDNER).

Components of PKVY 2.0 (2020–26)

1. **Cluster-based Organic Farming**

   20 ha clusters formed with common compost units.

2. **Participatory Guarantee System (PGS-India)**

   Farmer group certification for domestic markets.

3. **Organic Value Chain Development**

   Strengthening aggregation, processing, and marketing.

4. **Brand Building & Awareness**

   Use of "India Organic" and "Jaivik Bharat" logos.

5. **Training & Capacity Building**

   Skill development in organic inputs and integrated pest management.

6. **Field Demonstrations & Farmer Field Schools (FFS)**

   Practical learning through demonstration plots.

Funding Pattern

Category-wise Funding Ratio

Category	Funding Ratio
General States	60 (Centre): 40 (State)
NE & Himalayan States	90:10
UTs	100% Central funding

Per Hectare Assistance (3 years):

- ₹31,000 → organic inputs.
- ₹8,000 → certification & training.
- ₹11,000 → value addition & marketing support.

Average Cluster Support: ₹10–12 lakh for 20 ha cluster.

Certification System – PGS-India

Full Form: Participatory Guarantee System – India

Launched by: National Centre of Organic Farming (NCOF)

Objective:

Simplified certification for domestic organic markets based on mutual trust among small farmers.

Key Features

Group-based Evaluation

Group-based peer evaluation.

No Third-party Audit

No third-party audit required.

Cost-effective

Cost-effective & community-owned.

Domestic Sales

Valid for domestic sales (export requires NPOP certification).

Linked Portal: pgsindia-ncof.gov.in

Related Initiatives under Organic Farming Ecosystem

Initiative / Scheme	Launched by	Objective
Mission Organic Value Chain Development for North Eastern Region (MOVCDNER)	MoAFW (2015–16)	Organic clusters in NE states & value chain development.
National Programme for Organic Production (NPOP)	APEDA, MoC	Export certification system for organic products.
Jaivik Kheti Portal	DAC&FW	Online organic product marketing platform.
Bhartiya Prakritik Krishi Paddhati (BPKP)	NMSA (2020)	Zero-Budget Natural Farming approach.
Organic Value Chain Development in Himalayan States	MoAFW	Replicates MOVCDNER model in hill regions.

Achievements and Impact

32,000+ Clusters Formed

Covering >7 lakh farmers

6.5L Hectares Covered

Total area under organic farming

₹1,200Cr Organic Produce Traded

Through Jaivik Kheti & FPOs

45% Women Participation

Women farmer beneficiaries

Soil Health: Improved organic carbon and microbial content.

Sustainability: Enhanced water-use efficiency & reduced fertilizer subsidy dependence.

Challenges and Criticisms

Export Limitations

Limited export potential (PGS valid only for domestic trade).

Awareness Gap

Certification awareness still low among rural clusters.

Transition Period

Transition period (2–3 years) discourages small farmers.

Marketing Linkages

Marketing linkages weak in non-NER states.

Policy Alignment

Requires alignment with Fertilizer Subsidy Reforms and Carbon Farming incentives.

Policy Linkages and Related Acts

National Mission on Sustainable Agriculture (NMSA)

Umbrella framework.

Soil Health Card Scheme (2015)

Monitors fertility under organic adoption.

National Food Security Mission (NFSM)

Organic integration in pulses and millets.

PM PRANAM Scheme (2023)

Incentivizes states to reduce chemical fertilizer use.

Carbon Credit Trading Scheme (2023)

Potential income avenue for organic clusters.

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International Context

- **IFOAM** (International Federation of Organic Agriculture Movements) – global body defining organic principles.

- **FAO–UNEP Organic Agriculture Programme** – promotes sustainable agroecology.

- **EU Organic Regulation 2018/848** – benchmark for export certification.

- **India's Comparative Edge:** Low-input smallholder systems naturally suited for organic certification.

India's Broader Organic Vision

"One Nation, One Organic Brand"

Integration under National Organic Mission (2024–25):

- Converges PKVY, MOVCDNER, and BPKP under one unified organic policy.
- Aim: 10 million hectares under organic/natural farming by 2030
- Builds synergy with PM PRANAM and Amrit Dhara River Rejuvenation Mission for chemical reduction.

Tagline

"Healthy Soil, Healthy Food, Healthy People."

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Bhartiya Prakritik Krishi Paddhati (BPKP)

(An offshoot of Paramparagat Krishi Vikas Yojana – PKVY)

Introduction – What is BPKP? 🌿

Full Name: Bhartiya Prakritik Krishi Paddhati Programme

Launched by: Ministry of Agriculture & Farmers Welfare (MoAFW) under National Mission on Sustainable Agriculture (NMSA)

Introduced in: 2020-21 Union Budget

Minister (2025): Shri Arjun Munda

Implementing Department: Department of Agriculture and Farmers Welfare (DA&FW)

Core Objective:

To promote chemical-free, low-cost, traditional natural farming methods using on-farm resources — cow dung, urine, crop residues, and bio-inputs.

Core Principles and Philosophy

BPKP Philosophy = Zero Budget Natural Farming (ZBNF)

Inspired by Padma Shri Subhash Palekar's concepts of "Do-nothing farming."

Four Foundations (ZBNF Model):

1. **Jeevamrit** – Fermented cow-based microbial culture.
2. **Beejamrit** – Seed treatment with cow dung & urine.
3. **Mulching** – Organic cover to retain moisture & reduce weeds.
4. **Whapasa** – Soil aeration through balanced moisture, minimising irrigation.

Essence: Natural input self-reliance, no external chemicals or fertilizers.

Implementation Features

Parameter	Details
Funding	₹ 12,200 per hectare for 3 years (under PKVY sub-component).
Cluster Size	50 farmers forming a 20-ha cluster.
Coverage (2024)	6.5 lakh hectares across 8 states.
Main States	AP, MP, Himachal Pradesh, Odisha, UP, Chhattisgarh, TN, NE Region.
Linked Schemes	PM PRANAM, PKVY 2.0, MOVCDNER.
Certification	PGS-India (Domestic Organic Market).

Implementing Agencies: State Agriculture Departments & ATMA (Agricultural Technology Management Agencies).

Benefits and Impacts

Input Cost Reduction

60-80 % lower than chemical farming.

Soil Health Restoration

Higher organic carbon & microbial activity.

Water Efficiency

Reduced irrigation demand by ~30 %.

Climate Resilience

Improved crop resistance to drought and pests.

Income Security

Lower input costs + premium prices for natural produce.

Community Empowerment

Encourages local knowledge & women participation.

Example Model: Andhra Pradesh Community-Managed Natural Farming (APCNF) – largest BPKP pilot globally.

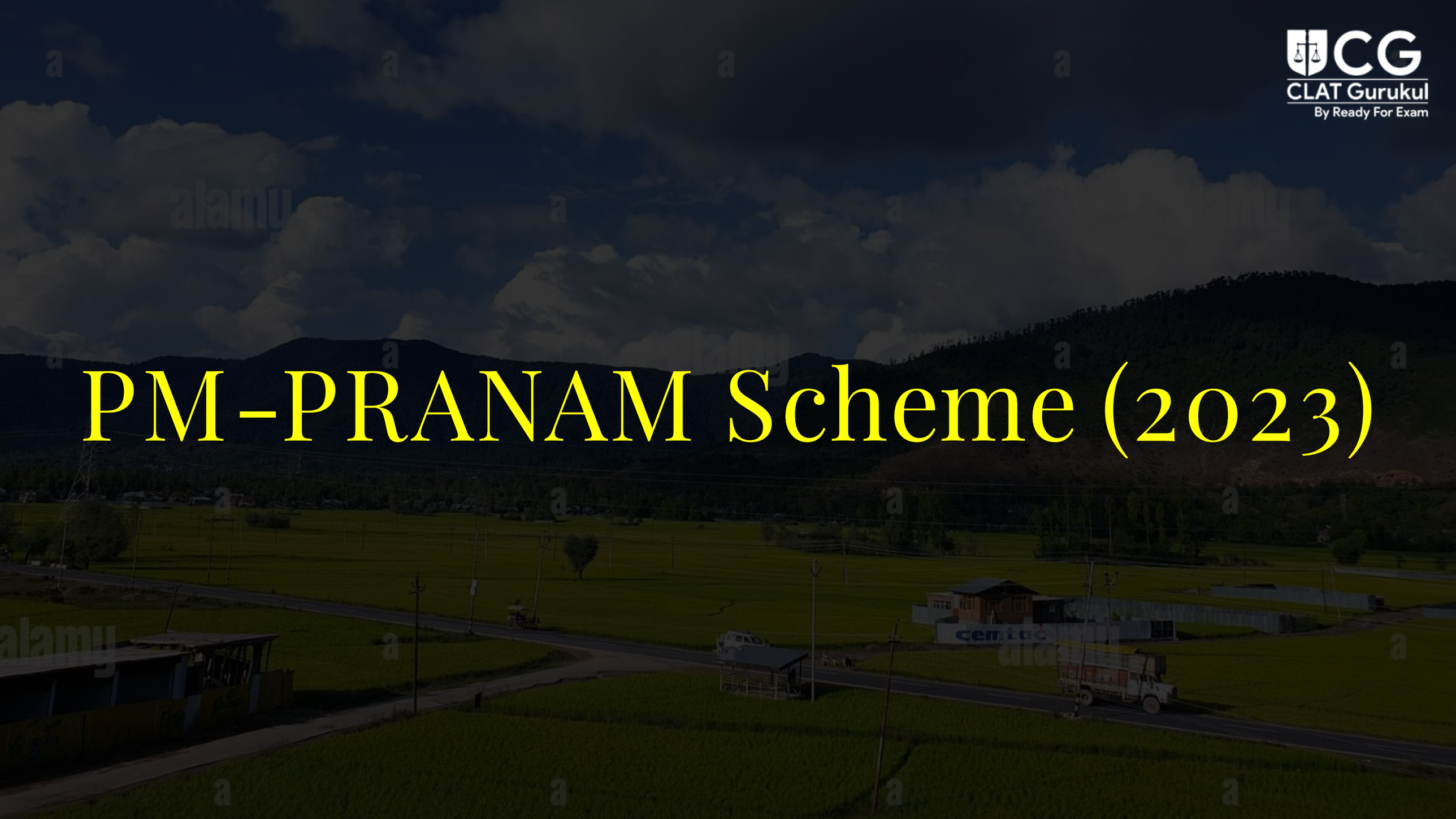
Policy Integration & Way Forward

Policy Linkages:

- **National Mission on Sustainable Agriculture (NMSA)** – umbrella framework.
- **PM PRANAM (2023)** – incentivises states for reducing chemical fertiliser use.
- **Carbon Credit Trading Scheme (2023)** – potential monetary reward for organic clusters.
- **Jaivik Kheti Portal** – marketing of BPKP produce.

Targets by 2030:

- 20 lakh hectares under natural farming.
- Integration of PKVY + BPKP into "National Mission on Natural Farming."



PM-PRANAM Scheme (2023)

Introduction – What is PM-PRANAM?

Full Form: PM Promotion of Alternate Nutrients for Agriculture Management Yojana

Launched in: 2023 (Union Budget 2023-24 Announcement)

Nodal Ministry: Ministry of Chemicals and Fertilizers – Department of Fertilizers

Current Minister (2025): Dr. Mansukh Mandaviya

Implementation Support: Ministry of Agriculture & Farmers Welfare (MoAFW)

Core Objective:

To encourage States & UTs to reduce chemical fertilizer consumption by promoting alternative and organic nutrients such as compost, bio-fertilizers, and natural inputs.

Scheme Mechanism & Funding Structure

Aspect	Details
Funding Source	Savings from reduced fertilizer subsidy bill.
Incentive Ratio	50 % of subsidy savings returned to State/UT governments.
Utilization of Incentives	70 % for creating infrastructure for alternate fertilizers (Organic, Bio-Fertilizers units). 30 % for R&D and capacity building.
Eligibility Condition	States that cut chemical fertilizer use below previous 3-year average consumption.
Funding Pattern	Entirely Central Government (through Department of Fertilizers).

Budget Outlay (2023-25): ~₹ 3,500 crore for pilot implementation.

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Objectives and Expected Outcomes

- Reduce India's dependency on urea and DAP imports.
- Promote balanced use of nutrients (N, P, K, S & micronutrients).
- Encourage States to adopt organic and natural farming models (PKVY & BPKP).
- Integrate use of Nano-Urea, Bio-Stimulants, and Compost Units.
- Create awareness through Soil Health Card data integration.
- Improve soil fertility and water retention capacity.

Strategic Goal:

To transform India's fertilizer subsidy model into an incentive-based sustainability model.

Related Schemes & Convergence

Linked Scheme	Nodal Ministry	Connection to PM-PRANAM
PKVY (Paramparagat Krishi Vikas Yojana)	MoAFW	Promotes organic farming clusters.
BPKP (Bhartiya Prakritik Krishi Paddhati)	MoAFW under NMSA	Encourages zero-budget natural farming.
National Mission on Sustainable Agriculture (NMSA)	MoAFW	Umbrella mission for resource efficiency.
Neem-Coated Urea Policy (2015)	Dept. of Fertilizers	Controlled urea release and reduced leaching.
Nano Fertilizers Initiative (2021)	IFFCO + Dept. of Fertilizers	Promote nano-urea as a low-volume alternative.

Integration: PRANAM serves as the policy bridge between chemical fertilizer rationalisation and organic agriculture promotion.

Soil Health Card (SHC) Scheme

Introduction – What is the Soil Health Card Scheme?

Full Name: Soil Health Card (SHC) Scheme

Launched by: Ministry of Agriculture and Farmers Welfare (MoAFW)

Launch Year: 19 February 2015

Launched by: Prime Minister Narendra Modi at Suratgarh, Rajasthan.

Current Minister (2025): Shri Arjun Munda

Objective:

To provide every farmer with a soil health card containing nutrient status of their soil and advisory for balanced fertilizer use for higher productivity and sustainability.

Tagline:

"Healthy Soil, Healthy Crop, Healthy Nation."

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Core Objectives & Importance

Key Goals:

1. Assess soil fertility on 12 parameters (macro & micro nutrients + pH & EC).
2. Promote judicious use of fertilizers to prevent nutrient imbalance.
3. Increase farm income through cost optimization.
4. Reduce environmental degradation caused by overuse of urea & chemicals.
5. Integrate with organic & natural farming programmes (PKVY, BPKP).

Broader Vision:

"From blanket fertilizer application to site-specific nutrient management."

Implementation Mechanism

Component	Details
Nodal Agency	Department of Agriculture & Farmers Welfare (DA&FW)
Executing Agencies	State Agriculture Departments, Soil Testing Laboratories (STLs), Krishi Vigyan Kendras (KVKs)
Cycle Duration	2 years per testing cycle
Sample Size	10.7 crore soil samples targeted; ~22 crore SHCs issued (as of 2024)
Parameters Analyzed	N, P, K, S, Zn, Fe, Mn, Cu, B, pH, EC, OC (12 total)
Technology Used	GPS-based soil sampling & mobile apps for farmers (Soil Health Card App).

Integration: Linked with Digital Agriculture Mission (2021) and National e-Governance Plan in Agriculture (NeGPA).

Key Achievements & Impacts

22

Crore SHCs Issued

In two phases (2015–17 & 2017–19)

10–15%

Fertilizer Savings

Average reduction in urea use

5–6%

Yield Improvement

In wheat, paddy, pulses, oilseeds

900+

New Labs

Soil Testing Labs established

- Nutrient Balance Index improved in multiple states (notably Gujarat & MP).
- Integration with PM-PRANAM: Data used to reward states reducing fertilizer use.
- Promotes organic inputs — compost, green manure, and biofertilizers.

Linked Initiative	Purpose
PM-PRANAM (2023)	Incentivises states to reduce fertilizer consumption using SHC data.
Digital Agriculture Mission (2021)	Integrates SHC data with AI and GIS for precision agriculture.
National Mission on Sustainable Agriculture (NMSA)	Umbrella mission for resource-efficient farming.

Future Vision (2025–30):

- Develop AI-driven SHC 3.0 with satellite soil monitoring.
- Use blockchain for fertilizer traceability.
- Move toward Soil Health Index for each district.

National Mission on Sustainable Agriculture (NMSA)

(Umbrella Programme for Climate-Resilient and Resource-Efficient Farming)

Introduction – What is NMSA?

Full Name

National Mission on Sustainable Agriculture (NMSA)

Launched in

2014-15

Nodal Ministry

Ministry of Agriculture & Farmers Welfare (MoAFW)

Department

Department of Agriculture & Farmers Welfare (DA&FW)

Minister (2025)

Shri Arjun Munda

Origin:

One of the 8 Missions under India's National Action Plan on Climate Change (NAPCC, 2008)

Core Objective:

To make agriculture more productive, resilient, and sustainable through efficient resource use, integrated farming systems, and climate adaptation technologies.

Mission Objectives and Strategy

Key Objectives:

- Enhance agricultural productivity while ensuring ecological balance.
- Promote Integrated Farming Systems (IFS) — crop-livestock-horticulture synergy.
- Restore soil health, water efficiency, and nutrient balance.
- Develop climate-resilient cropping systems.
- Promote organic and natural farming.
- Support conservation of rainfed areas.

Strategy:

Area-based and cluster approach.

Convergence with schemes like PKVY, BPKP, PMKSY, and Soil Health Card.

Focus on "per drop, more crop" and carbon-smart farming.

Key Components of NMSA

Component / Sub-Mission	Focus Area
Rainfed Area Development (RAD)	Integrated farming in rainfed zones.
Soil Health Management (SHM)	Soil fertility restoration & nutrient management.
Paramparagat Krishi Vikas Yojana (PKVY)	Organic farming promotion.
Bhartiya Prakritik Krishi Paddhati (BPKP)	Natural, zero-budget farming.
On-Farm Water Management (OFWM)	Water-use efficiency, micro-irrigation.
Climate Change Adaptation & Mitigation (CCAM)	Technology demonstrations & awareness.

Special Focus: Small & marginal farmers, arid & semi-arid regions, and NE states.

Implementation Framework

At National Level:

- Department of Agriculture & Farmers Welfare (DA&FW) – Policy & fund allocation.
- National Rainfed Area Authority (NRAA) – Technical guidance.
- National Mission Directorate – Coordination of sub-components.

Implementation Framework

01

At State Level:

- State Departments of Agriculture – Programme execution.
- State Level Executive Committees (SLEC) – Approvals and monitoring.

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At District Level:

- District Agriculture Officer / ATMA – Cluster identification & training.

Convergence:

Linked with PM-KUSUM, PMKSY, PM-PRANAM, Soil Health Card, and Digital Agriculture Mission.

Significance and Achievements

Impact Highlights:

- Improved soil organic carbon & nutrient balance in >15 lakh ha.
- Promoted organic/natural farming across 10 lakh ha under PKVY & BPKP.
- Increased micro-irrigation coverage and water-use efficiency.
- Introduced Climate-Smart Villages model (pilot in 10 states).
- Integrated AI-based decision support tools for weather & crop advisory (IMD collaboration).

Long-Term Vision

(NMSA 2.0, 2025–30):

25%

reduction in chemical fertilizer use

Achieve sustainable farming practices

20M

hectares under sustainable practices

Bring vast areas into the program

—

Develop Carbon-Neutral Farming Zones

Creating environmentally balanced agriculture

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The Water-Sharing Dispute Between Punjab and Haryana

Why in the News

- Punjab rejected the Bhakra Beas Management Board's (BBMB) decision to release an additional 4,500 cusecs of water to Haryana.
- Tensions have escalated between Punjab and Haryana over water allocation.
- All major political parties in Punjab unanimously opposed the decision, citing water scarcity in Punjab.

Current Crisis: What Triggered the Dispute?

1

April 23, 2025

Haryana requested 8,500 cusecs from the Bhakra-Nangal project—about 4,500 cusecs more than its current supply.

2

BBMB Decision

The BBMB approved this allocation in a vote dominated by BJP-ruled member states (Haryana, Rajasthan, and Delhi).

3

Punjab's Response

Punjab Chief Minister Bhagwant Mann and other political parties opposed the move, stating: "Punjab does not have a single drop to spare."

4

Legal Escalation

The matter is likely to go to the Supreme Court as Punjab is considering legal options.

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Historical Background: BBMB & River Water Sharing

Bhakra-Nangal Project:

- Originated in the 1910s, completed post-Independence.
- Consists of:
  - Bhakra Dam on Sutlej (Himachal Pradesh),
  - Nangal Dam downstream in Punjab.
- Vision of Jawaharlal Nehru – a key part of India's early river valley projects.

BBMB and Important Projects

- **BBMB (Bhakra Beas Management Board):**

Formed in 1966 post Punjab Reorganisation Act.

Later renamed BBMB in 1976.

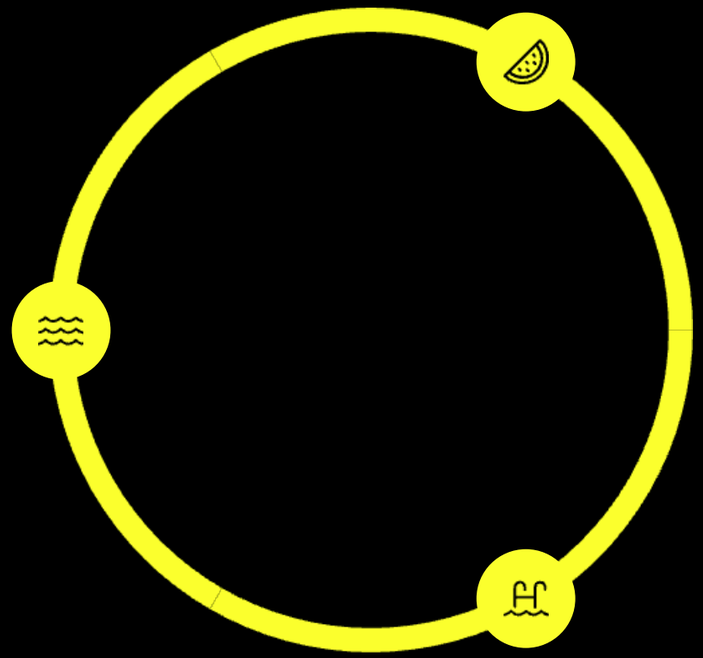
Administers water distribution for Punjab, Haryana, Rajasthan, Himachal Pradesh, and Delhi.

- **Other Important Projects:**

Beas-Sutlej Link Project (Pandoh Dam)

Pong Dam – all in Himachal Pradesh, also managed by BBMB.

How Water is Allocated?



Punjab

5.512 MAF (million acre-feet)

Haryana

2.987 MAF

Rajasthan

3.318 MAF

Every year (typically September to August), the BBMB allocates river water according to the above distribution.

Issue now: Punjab says it has already withdrawn 3.110 MAF, i.e., over 56% of its quota.

Haryana argues: It hasn't received its rightful share and urgently needs water for drinking and agriculture, especially in Hisar, Sirsa, Fatehabad.

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Why Is There Less Water This Year?

12 ft

Bhakra Dam

Lower than previous year

16.9 ft

Ranjit Sagar

Lower than normal

31.87 ft

Pong Dam

Lower than normal

Scant snowfall in the Himalayas → Less glacier melt → Lower dam levels.

Political & Legal Reactions

Punjab's stand:

- All parties united.
- Decision termed "unprecedented and forcible".
- May challenge BBMB's decision in Supreme Court.

Haryana's stand:

- CM Nayab Singh Saini accused Punjab of "dirty politics".
- Asserted that Haryana is being deprived of its rightful share.
- Ex-CM Dushyant Chautala said: "Water is life, and the share is sacrosanct."

Insights

BBMB Structure

BBMB is a multi-state statutory body managing river waters & power distribution.

Historical Context

Punjab-Haryana water sharing disputes date back to creation of Haryana (1966).

Related Disputes

SYL Canal (Sutlej-Yamuna Link) is another point of dispute between the states.

National Pattern

River water disputes are not uncommon in India (ex: Krishna, Cauvery, Yamuna).

Constitutional Aspect

Current tensions may become a constitutional matter under Article 262 + Schedule 7 (Union vs. State list).

Constitutional and Legal Provisions on Inter-State Water Sharing

Article 262(1)

Parliament may by law provide for the adjudication of disputes or complaints with respect to the use, distribution, and control of waters in inter-State rivers and river valleys.

Article 262(2)

Parliament may exclude the jurisdiction of Supreme Court or any other court over such disputes.

Key Point

Parliament can establish exclusive tribunals for water disputes that are outside the purview of regular judiciary.

Inter-State River Water Disputes Act, 1956

Enactment

Enacted under Article 262.

Process

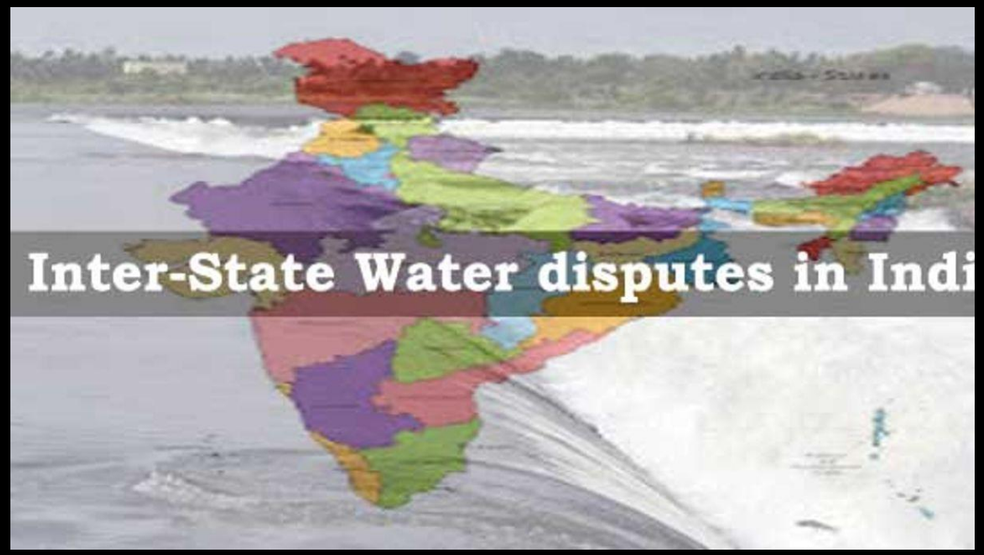
Allows a state government to request the Central Government to refer a dispute to a tribunal.

Finality

The Tribunal's decision is final and binding (not appealable in courts).

2019 Amendment

Central government may set up a single standing tribunal with multiple benches to ensure faster resolution.



🏛️ Legal Application: Punjab and Haryana could escalate their Bhakra-Beas-related grievances to a tribunal under this Act.

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Entry in the Seventh Schedule (Distribution of Powers)

Entry 17, State List (List II):

"Water: water supply, irrigation and canals, drainage and embankments, water storage and water power... subject to the provisions of Entry 56 of List I."

Entry 56, Union List (List I):

"Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest."

🧩 Implication:

Water is primarily a state subject, but in case of inter-state rivers, the Union government can legislate and intervene.

Judicial Interpretation & Precedents

Although Article 262 bars Supreme Court jurisdiction once a tribunal is constituted, the Court can still:

Constitutional Validity

Examine constitutional validity of laws.

Implementation Issues

Intervene in implementation issues post-tribunal decision.

Article 131

Use Article 131 (original jurisdiction) to handle disputes between states in the absence of a tribunal.

Example Cases:

- State of Karnataka v. State of Andhra Pradesh (2000): clarified tribunal powers and Centre's role.
- Punjab v. Haryana (SYL Canal case): SC intervened due to non-implementation of a tribunal award.

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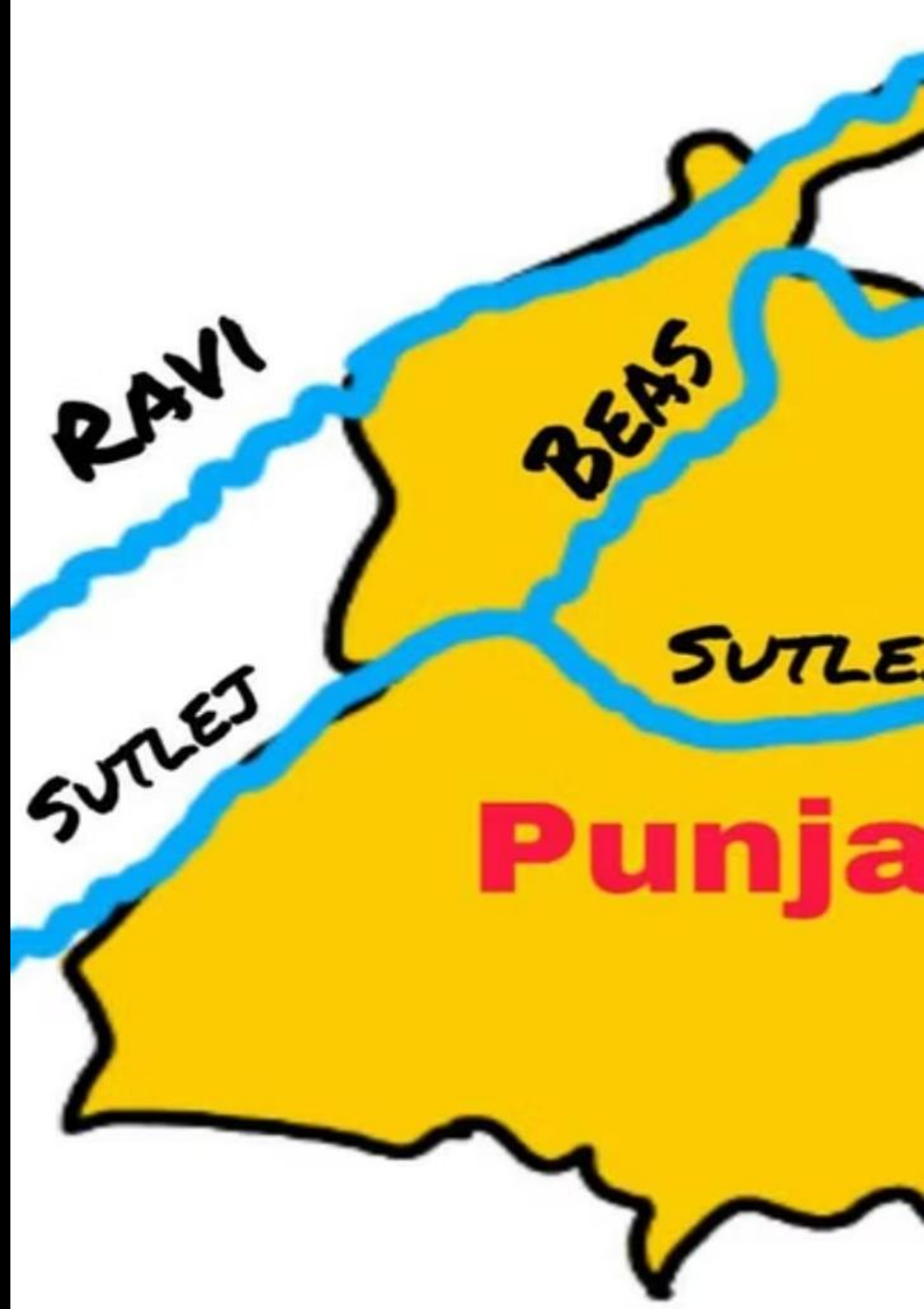
In Context: Punjab–Haryana Dispute (2025)

Aspect	Constitutional Provision / Legal Mechanism
BBMB water allocation challenge	May be contested in court via Article 131 (state vs. state)
Long-term dispute	May require a new tribunal under ISRWD Act
Current status	Administered by BBMB under Punjab Reorganisation Act, 1966
Federal sensitivity	Union must balance the state list authority of Punjab & Haryana with entry 56 (Union control)



Sutlej-Yamuna Link (SYL) Canal Dispute

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Why in News?

Haryana Vidhan Sabha Resolution

In 2022, the Haryana Vidhan Sabha passed a resolution seeking the early completion of the SYL Canal, reigniting a long-standing and politically sensitive dispute between Punjab and Haryana over river water sharing.

Haryana CM's Assertion

Haryana CM asserted that the right to Ravi-Beas waters is historically, constitutionally, and judicially established.

Historical Background

1955 Agreement

1

Pre-Haryana formation, the Union Government allocated:

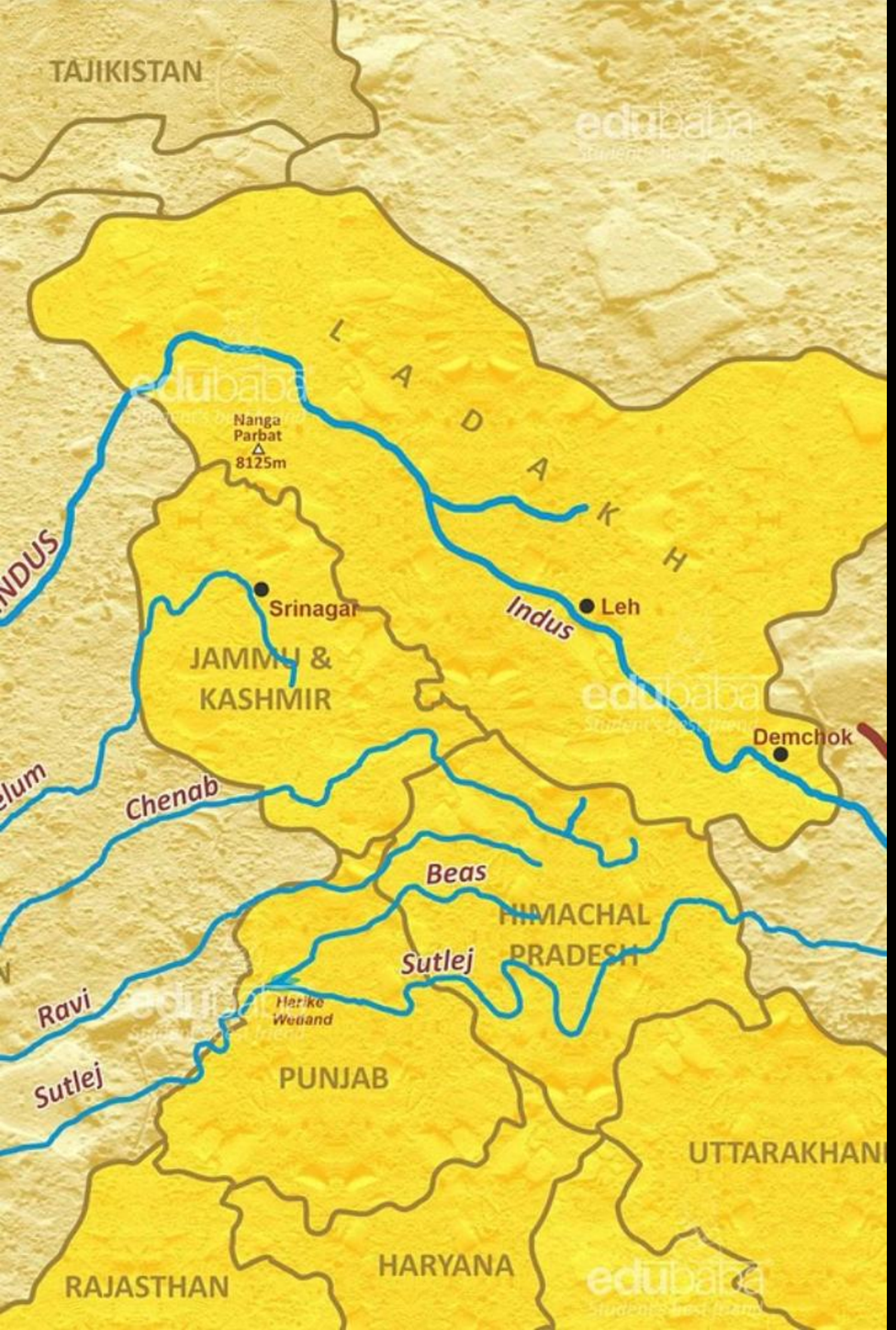
- 8 MAF (Million Acre Feet) to Rajasthan
- 7.20 MAF to undivided Punjab
- 0.65 MAF to Jammu & Kashmir

2 1966 Punjab Reorganisation Act

Haryana carved out of Punjab.

As a successor state, Haryana was entitled to a portion of Punjab's water share.

Punjab, however, objected on riparian principles (states directly along a river have exclusive rights to its water).



Water Reallocation History

1976 Notification

Centre reallocated 3.5 MAF to Haryana from Punjab's share.

Punjab continued to resist implementation.

1981 Reassessment

Water estimated at 17.17 MAF (Ravi + Beas)

Reallocation:

- Punjab: 4.22 MAF
- Haryana: 3.5 MAF
- Rajasthan: 8.6 MAF

Canal Construction Timeline

Date	Event
April 8, 1982	Indira Gandhi laid the foundation stone at Kapoori (Patiala)
1985	Rajiv Gandhi–Longowal Accord promised reassessment and tribunal
1987	Eradi Tribunal (headed by SC judge V. Balakrishna Eradi) increased Punjab's share to 5 MAF and Haryana's to 3.83 MAF
1990	Chief Engineer and Superintending Engineer of the SYL project were killed by militants
Construction Halted	Violence and terrorism led to work being stopped

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Constitutional and Legal Provisions

Article 262

Water Disputes Tribunal jurisdiction.

Parliament may by law provide adjudication via tribunals.

Inter-State Water Disputes Act, 1956 enacted for this.

Article 131

Original jurisdiction of the Supreme Court for inter-state disputes (used in SYL case).

Relevant Court Judgments

SC consistently upheld that Haryana has a legal right to the Ravi-Beas waters and the SYL canal should be completed.

In 2016, Punjab passed a termination law to return acquired land to farmers.

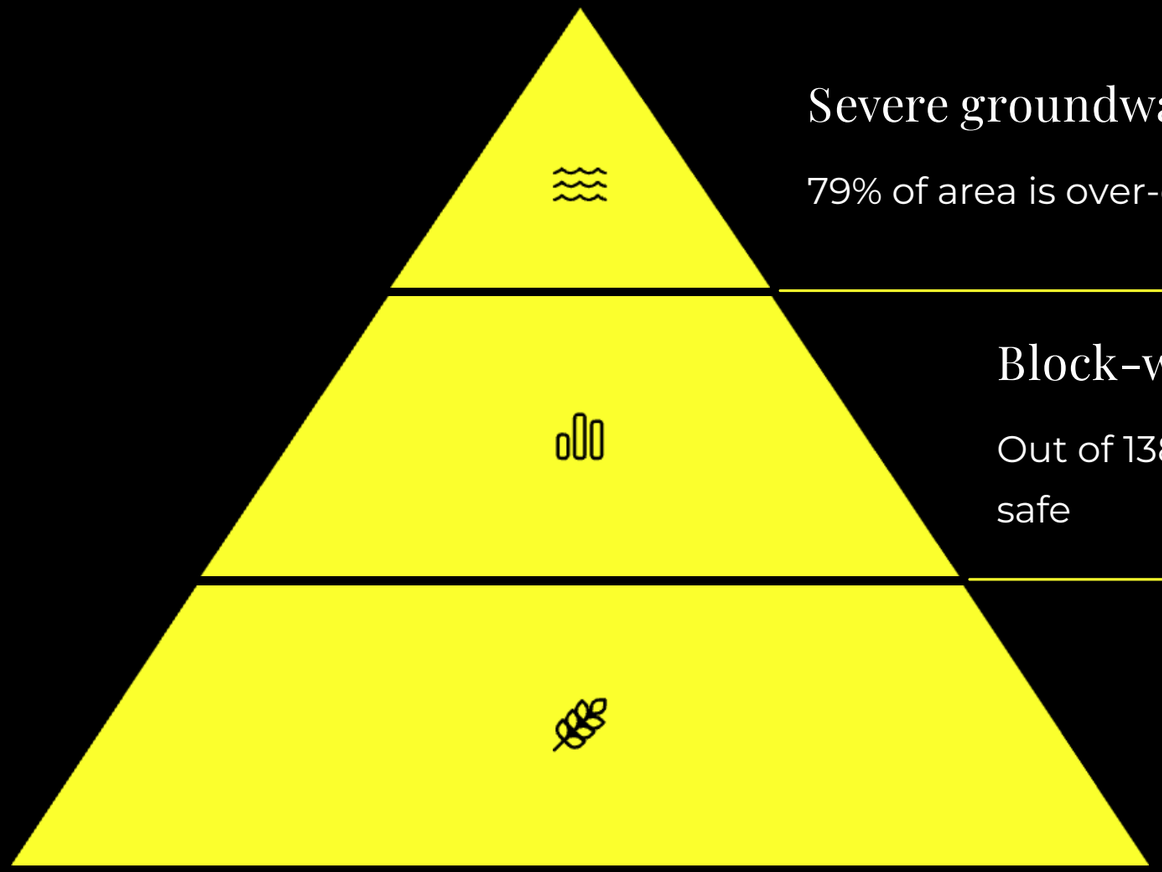
SC invalidated Punjab's unilateral cancellation of the SYL project.

Geography: Rivers Involved

River	Description
Sutlej	Originates in Tibet; flows through Himachal Pradesh & Punjab
Beas	Tributary of Sutlej; originates in Himachal Pradesh
Ravi	Flows through Himachal, Punjab (India & Pakistan)
Yamuna	Originates in Yamunotri, flows through Haryana and UP

- SYL Canal's purpose: Connect Sutlej (via Beas/Ravi) with Yamuna, to transfer water from Punjab to Haryana.

Punjab's Argument



Severe groundwater depletion

79% of area is over-exploited

Block-wise assessment

Out of 138 blocks: 109 over-exploited, 2 critical, 5 semi-critical, only 22 safe

Agricultural contribution

Can't spare water while feeding the nation (producing wheat & paddy worth ₹70,000 crore annually)

Punjab claims SYL completion will hurt agriculture and deplete resources further.

Haryana's Argument

Water Shortage

Faces acute irrigation and drinking water shortages.

Groundwater Depletion

Some districts have groundwater levels depleted to 1,700 feet.

Legal Basis

Justified its claim based on 1976 allocation, Eradi Tribunal Award (1987), and SC verdicts.

Food Contribution

Points to its significant contribution to central food grain pool.

Present Status

Incomplete Canal

Canal remains incomplete.

Political Deadlock

Political deadlock continues.

Court Directives

SC directives exist, but Centre has not enforced construction.

Haryana's Position

Haryana has repeatedly urged Centre to complete the canal.

Punjab's Concerns

Punjab maintains state's ecological and agrarian security is at risk.

The Udhampur-Srinagar-Baramulla Rail Link (USBRL) and the Iconic Chenab Bridge

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Why in News?

Vande Bharat Trains Flagged Off

Prime Minister Narendra Modi flagged off two Vande Bharat trains to Kashmir

Chenab Rail Bridge Inaugurated

The **Chenab Rail Bridge**, the *world's highest railway bridge*, was inaugurated

Landmark Moment

This marks a landmark moment in India's infrastructure history and J&K's development

What is the USBRL Project?

272-km Rail Link

A 272-km **Udhampur–Srinagar–Baramulla Rail Link**

All-Weather Connectivity

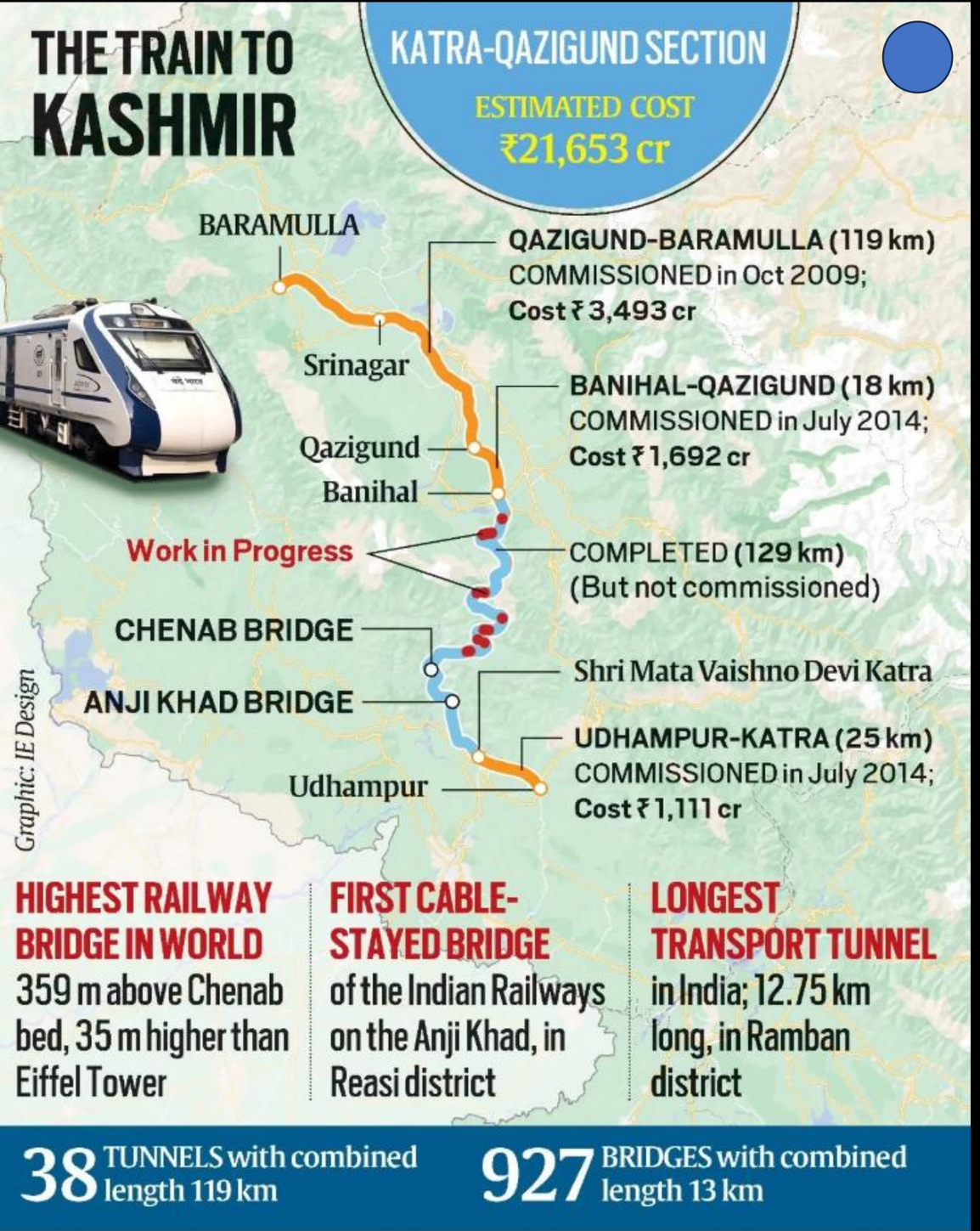
Connects the Kashmir Valley with the rest of India via **all-weather rail connectivity**

Massive Infrastructure

Contains **943 bridges** and **36 tunnels**

Key Segments

Udhampur-Katra, Katra-Banihal, Banihal-Qazigund, Qazigund-Baramulla



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Key Highlights

Specially Modified Trains

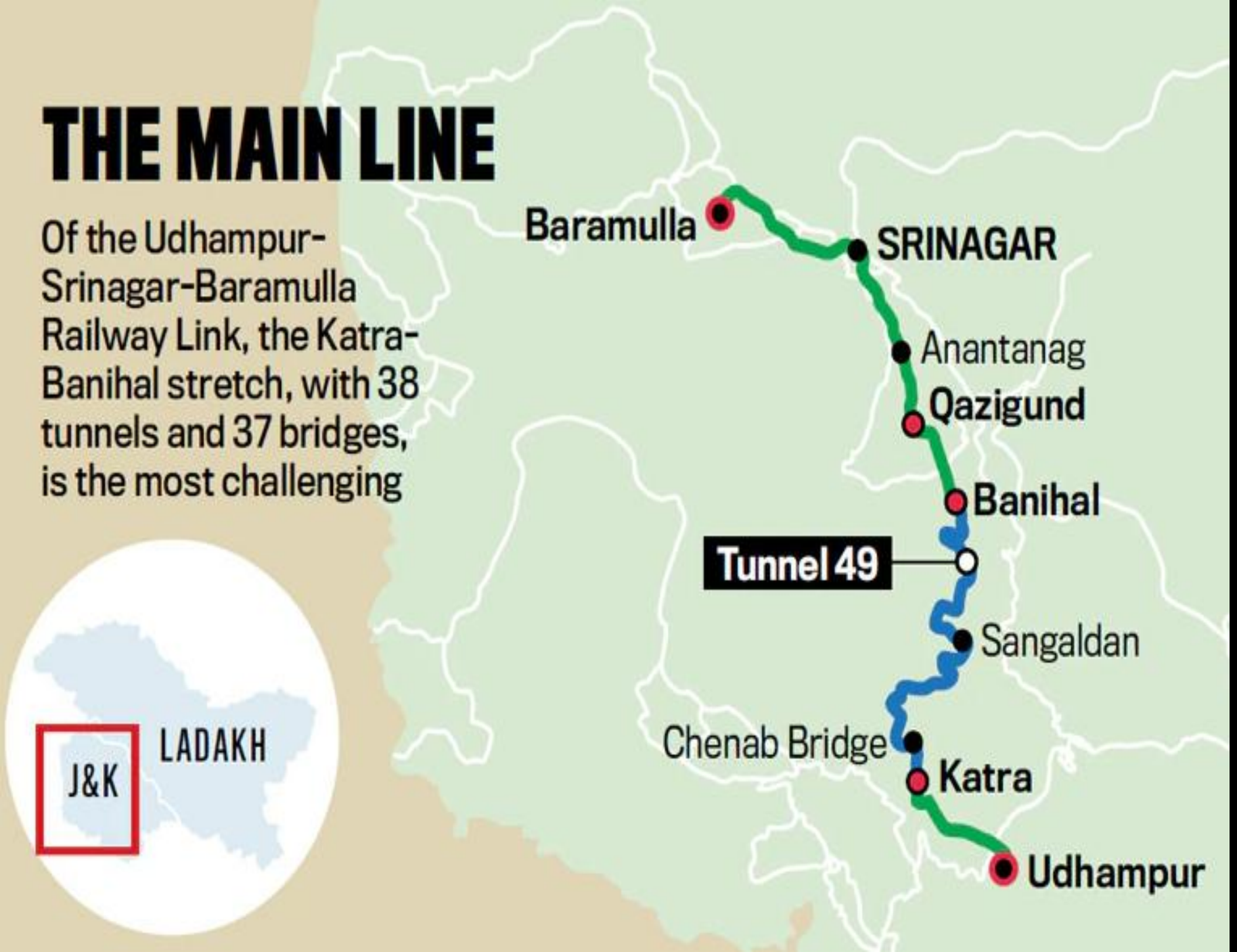
Two Vande Bharat trains (specially modified for snow-clad Himalayas) launched between **Katra and Srinagar**.

Reduced Travel Time

Travel time cut by 2–3 hours and ensures **all-weather surface connectivity** to Kashmir Valley.

THE MAIN LINE

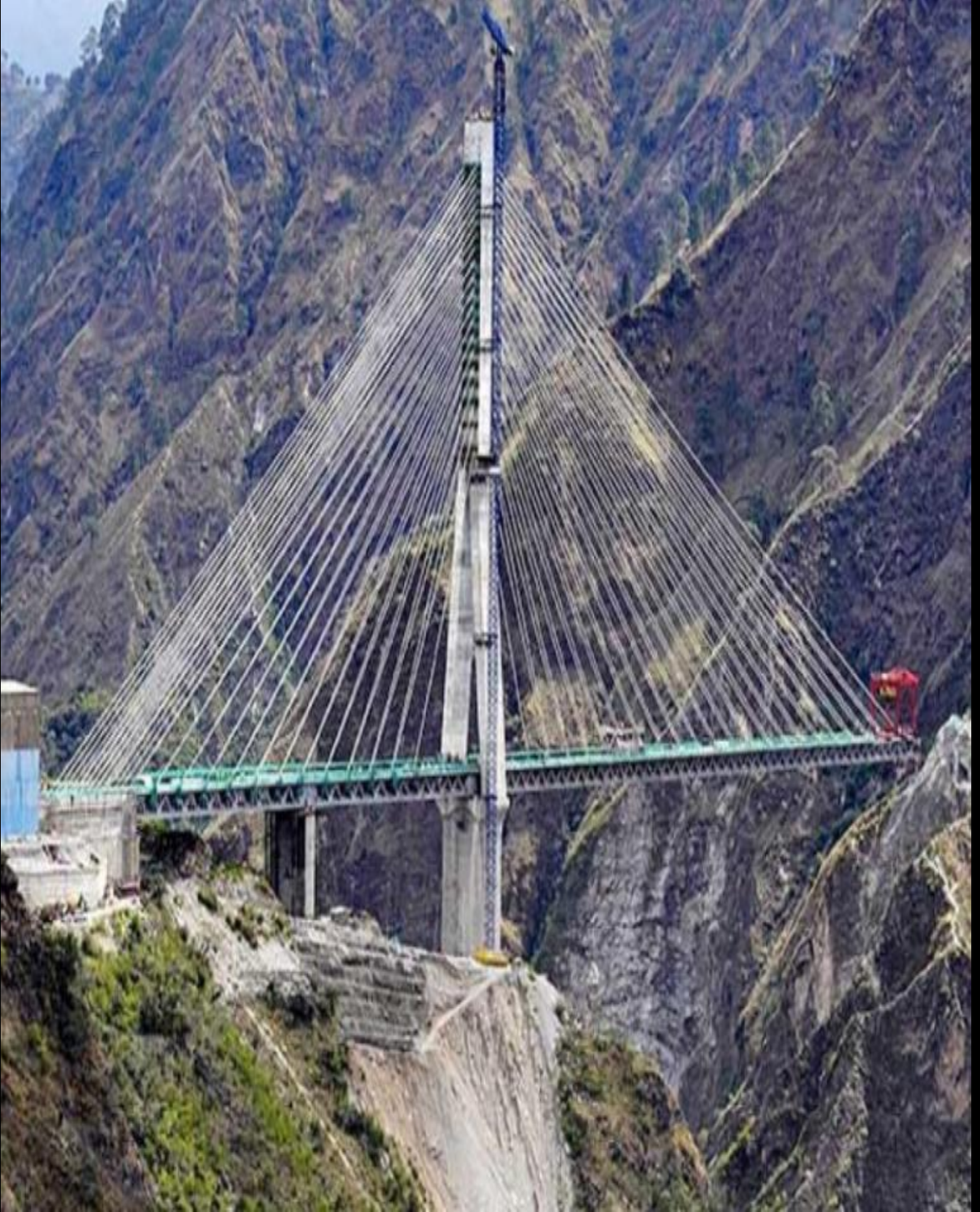
Of the Udhampur-Srinagar-Baramulla Railway Link, the Katra-Banihal stretch, with 38 tunnels and 37 bridges, is the most challenging



Engineering Marvels Inaugurated

Chenab Rail Bridge

- **World's highest railway bridge**
- Height: 359 meters above river Chenab
- A marvel of civil engineering, earthquake-resistant



Engineering Marvels Inaugurated

Anji Khad Bridge

- **India's first cable-stayed railway bridge**
- Links Katra and Reasi
- Enhances spiritual and tourist access to J&K

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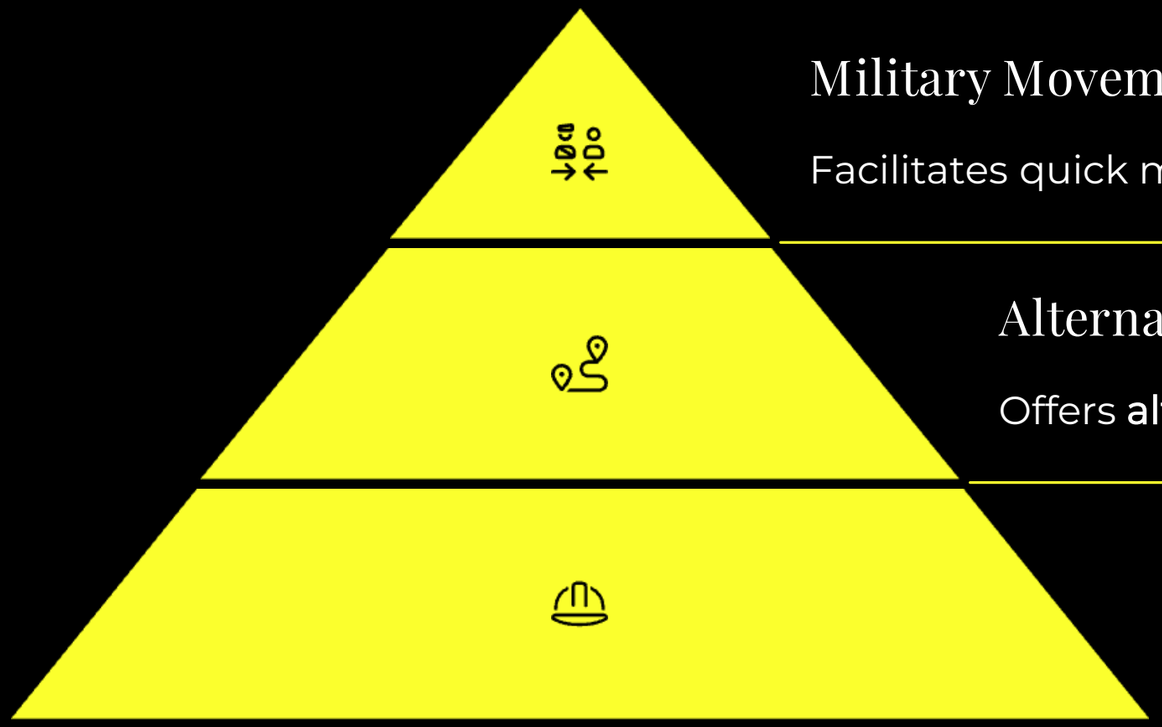
Chenab Rail Bridge: The Centrepiece of the Project

Feature	Detail
Height	359 metres above Chenab River (35m higher than Eiffel Tower)
Main Arch Span	467 metres
Construction Material	Over **29,000 tonnes of steel**
Location	Reasi district, Jammu & Kashmir
Resilience	Withstands wind speeds up to **266 km/h** and **Zone-V earthquakes**
Lifespan	120+ years
Status	*World's highest railway bridge*
Built over	Deep gorge of River Chenab

Security & Strategic Importance



Military Movement

Facilitates quick military movement in sensitive border areas

Alternate Route

Offers **alternate route to NH-44**

Weather Resilience

NH-44 is landslide-prone and vulnerable in winter

Boost to Economy & Spiritual Tourism

Spiritual Tourism

Enhances access to **Vaishno Devi**, **Amarnath**

Logistics Improvement

Improves logistics and reduces travel time drastically

Trade Routes

Improves trade routes across J&K

Livelihood Generation

Expected to generate **livelihood**

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Are Bhakra and Nangal a single dam?

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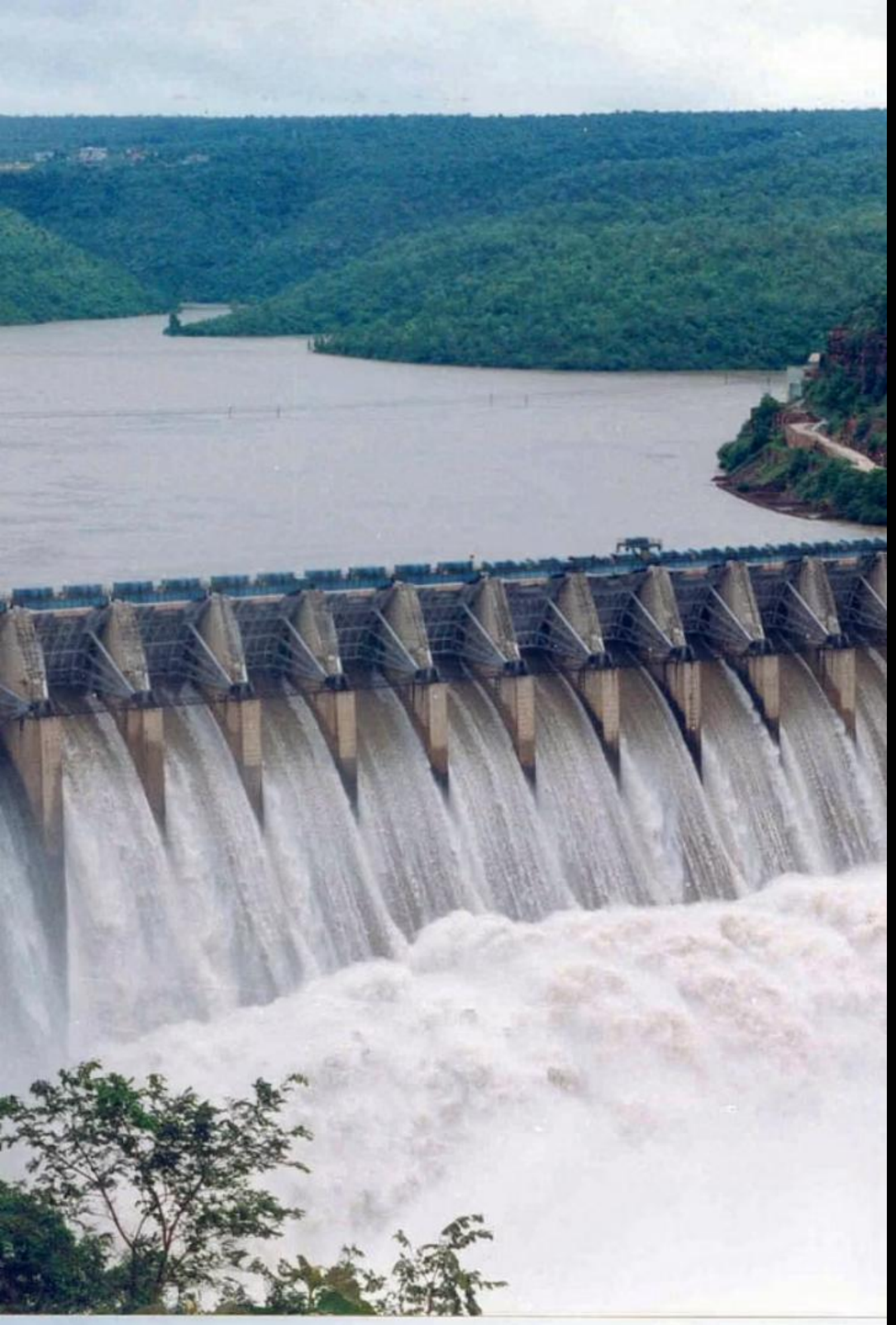

Two Separate Structures

Separate but Connected

No, the **Bhakra** and **Nangal** are **two separate structures**, but they are part of the **same dam system** and **closely interconnected**.

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Bhakra Dam

🏞️ Bhakra Dam

- **Type:** Concrete gravity dam
- **Location:** Across the **Sutlej River** in **Bilaspur district, Himachal Pradesh**
- **Height:** ~226 meters
- **Purpose:** Major water storage, irrigation, and hydroelectric power generation
- **Reservoir:** Gobind Sagar Lake

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Nangal Dam

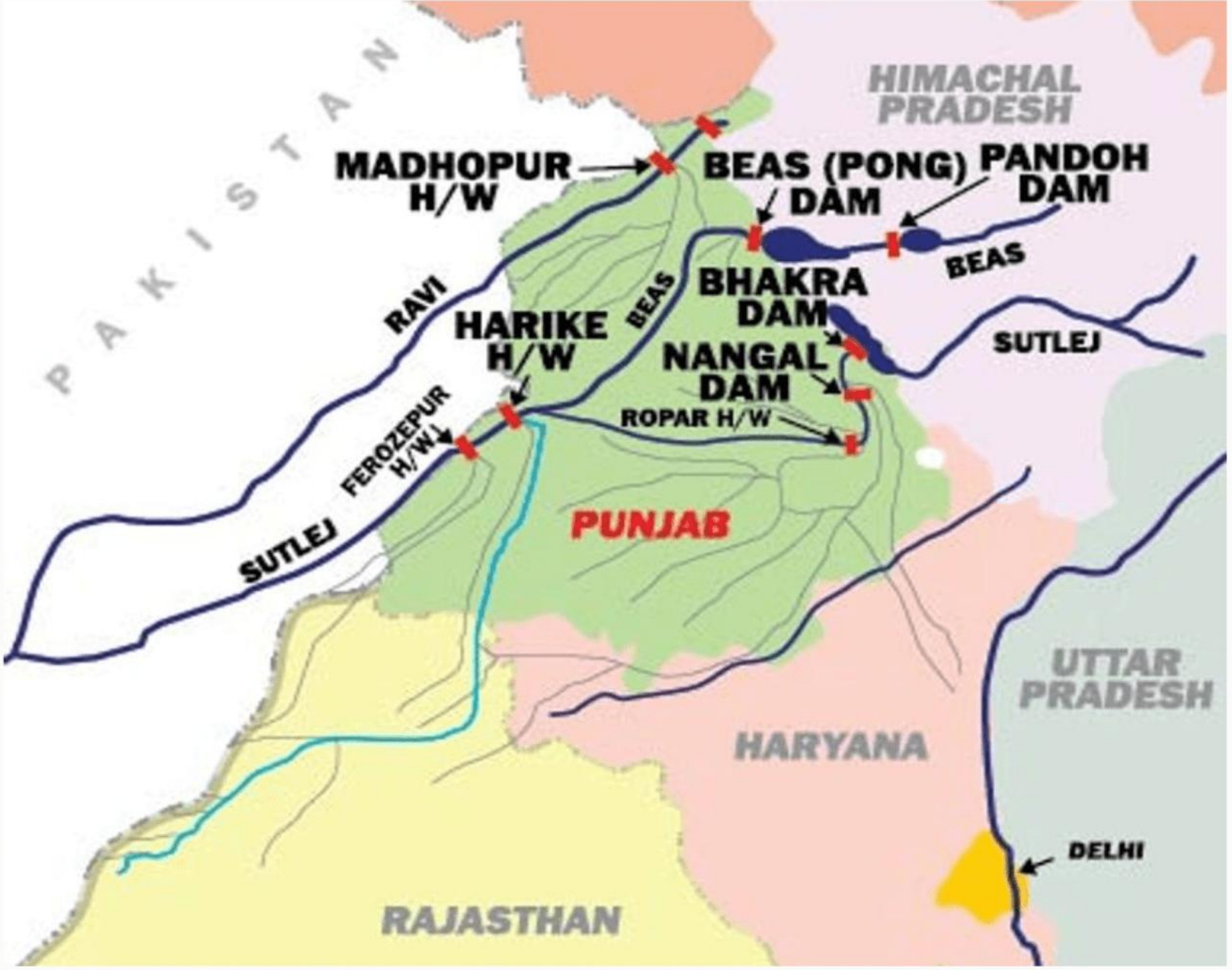
1. Nangal Dam

   Type: Barrage

2. **Location:** About **13 km downstream** of Bhakra Dam, near **Nangal town** in **Punjab**

3. **Purpose:** It **regulates the water released** from Bhakra Dam and **diverts** it into the **Nangal Hydel Channel** and **Bhakra Main Canal** for irrigation and further distribution

4. **Height:** Much smaller than Bhakra, more of a diversionary structure


PAKISTAN
HIMACHAL PRADESH
MADHOPUR H/W
BEAS (PONG) DAM
PANDOH DAM
BEAS
BHAKRA DAM
SUTLEJ
RAVI
BEAS
HARIKE H/W
NANGAL DAM
ROPAR H/W
FEROZEPUR H/W
SUTLEJ
PUNJAB
UTTAR PRADESH
HARYANA
DELHI
RAJASTHAN

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How They Work Together

Water Storage

Water is stored in Bhakra Dam's huge reservoir.

Controlled Release

Controlled release flows down to **Nangal Dam**, where it's regulated and distributed.

Unified System

Together, they support the **Bhakra-Nangal Project**, a major part of India's **Green Revolution infrastructure**.

What is the Difference Between a Dam and a Barrage?

Feature	Dam	Barrage
Purpose	Stores a large volume of water	Regulates river flow without major storage
Structure	Usually high, solid wall (gravity, arch, etc.)	Low structure with gates across river
Reservoir	Creates a large reservoir (backwater storage)	No significant reservoir; water flows over/under
Flow Control	Regulates both **storage** and **release**	Controls **distribution** of flow
Examples	Bhakra Dam, Tehri Dam	Nangal Barrage, Farakka Barrage
Use	Power generation, irrigation, flood control	Irrigation, navigation, flow diversion

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Tulbul Navigation Project

AC

Why in News?

Political Row

A political row erupted between J&K CM Omar Abdullah and PDP leader Mehbooba Mufti over the revival of the Tulbul Navigation Project.

IWT Suspension

The debate was reignited after India temporarily suspended the Indus Waters Treaty (IWT) with Pakistan following the April 22, 2025 Pahalgam terror attack.

Abdullah's Position

Abdullah called for reviving the Tulbul Barrage, calling the IWT "historically unfair" to Jammu and Kashmir.

Mufti's Criticism

Mufti criticized the move as "provocative" and "irresponsible" amid fragile India-Pakistan ties.

Historical Background

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Tulbul Navigation Project

A barrage project on the Jhelum River at the mouth of Wular Lake in North Kashmir.

Initiated in 1984

The project aimed to improve navigation and ensure water availability during winters.

Work Halted

Work halted under pressure from Pakistan, which objected under the Indus Waters Treaty (1960).

Pakistan's Objection

Pakistan argued the barrage violated the IWT provisions which give them rights over western rivers (Jhelum, Chenab, Indus).

INDO-PAK TALKS ON WULAR BARRAGE

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Key Features of Tulbul Navigation Project

Location

Wular Lake, Bandipora District, Jammu & Kashmir

River

Jhelum (Western River under IWT)

Structure

Navigation lock-cum-barrage

Purpose

Navigation

Maintain navigation in Jhelum River

Hydropower

Increase water availability for hydropower generation during lean season

Water Resources

Enhance water flow for irrigation and drinking in J&K

Constitutional & Legal Provisions

Article 262

Empowers Parliament to legislate on inter-state river disputes; bars judicial intervention in water disputes if so provided by law.

Inter-State Water Disputes Act, 1956

Legal framework for river water disputes within India.

Indus Waters Treaty (1960)

A bilateral international treaty; not governed under Article 262 or Indian law.

India's Rights: Unrestricted use of Eastern Rivers (Ravi, Beas, Sutlej)

Pakistan's Rights: Unrestricted use of Western Rivers (Indus, Jhelum, Chenab)

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Recent Legal Stance

India's Position

India is within rights to suspend or review treaties under Article 51(c) and international law if its sovereignty or national security is threatened.

⚖️ Court Judgements & Precedents

No direct Supreme Court judgment on the Tulbul Project, but broader observations:

- The SC has upheld treaty obligations under Article 51 (international peace and treaties) but not at the cost of national security or sovereignty.
- Any withdrawal or review of a treaty is part of executive power, as recognized in various international law commentaries and judicial observations.

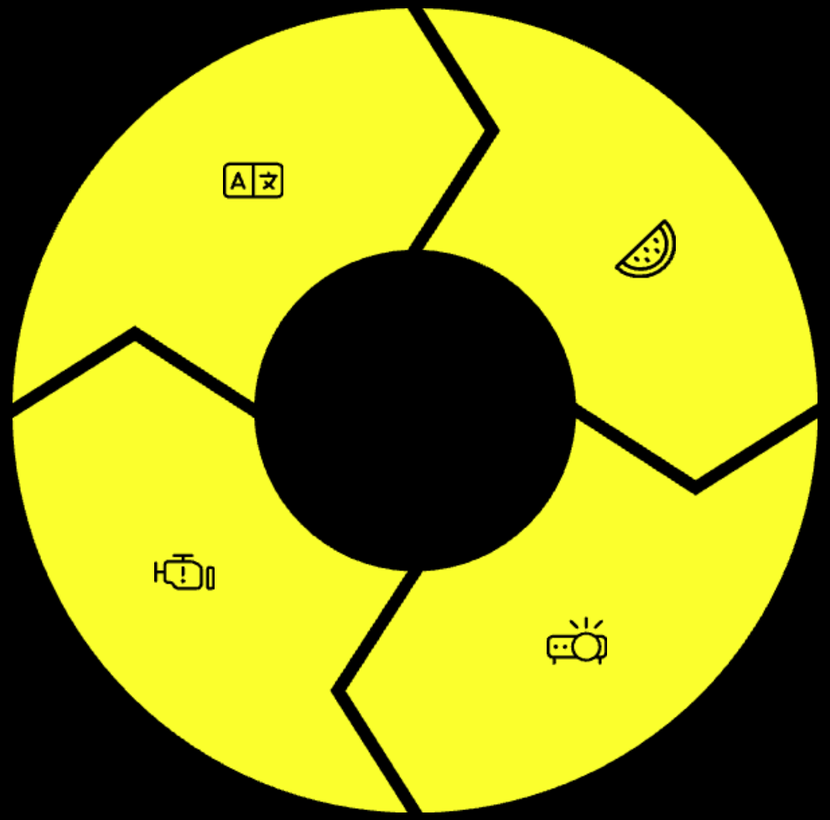
Current Political Controversy

Omar Abdullah's Stand

Described IWT as a "historic betrayal" for J&K.

Mehbooba Mufti's Response

Calls the proposal "dangerously provocative" at a time of regional instability.



Water Resources

Advocates that J&K must be allowed to use its own water resources.

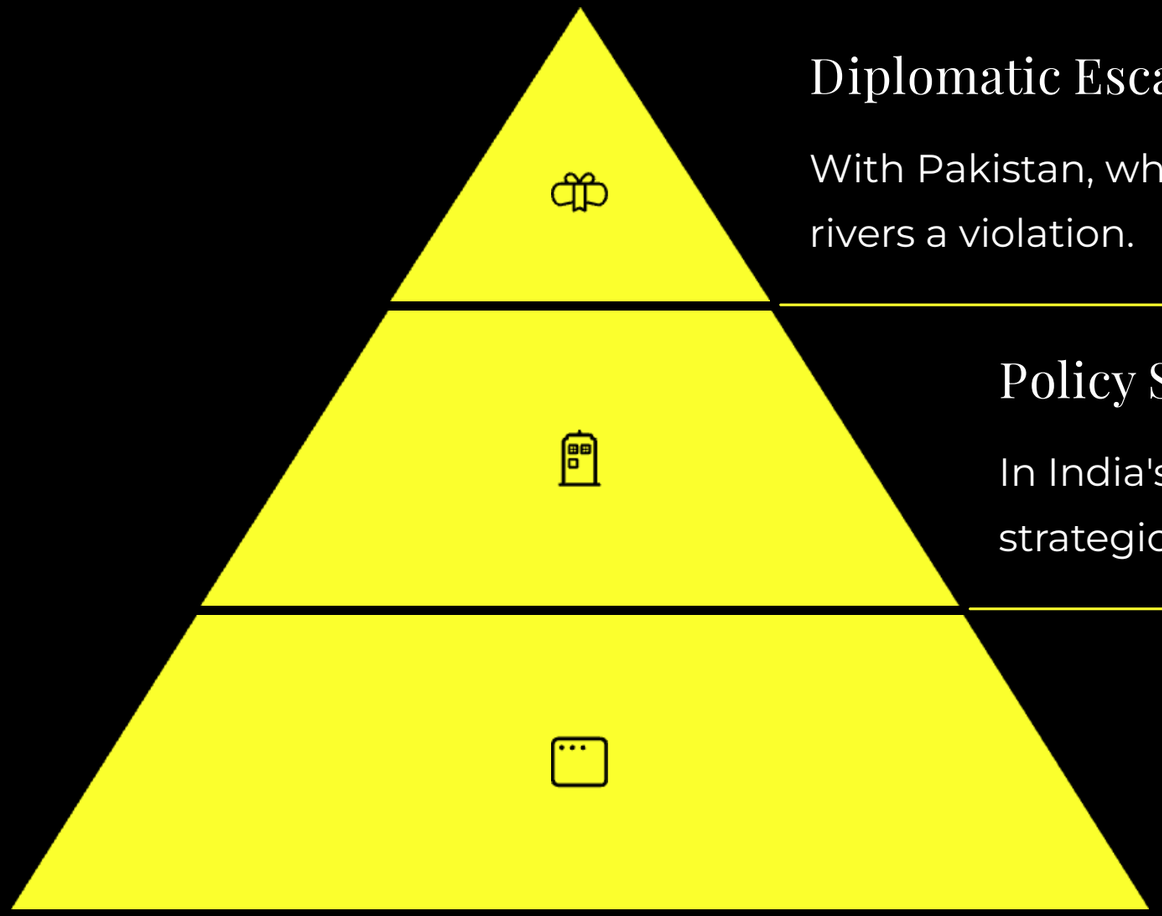
Project Revival

Seeks revival of Tulbul project now that IWT is "temporarily suspended".

Mufti warns against "weaponizing water", potentially escalating India-Pakistan tensions.

Accuses Abdullah of seeking "cheap publicity" and shifting political loyalties.

Geopolitical Implications



Diplomatic Escalation

With Pakistan, which considers any Indian infrastructure on western rivers a violation.

Policy Shift

In India's approach to treaty renegotiation and water as strategic leverage.

Regional Development

Enhanced water resource autonomy for J&K, supporting regional development.

III. Major Hydroelectric Projects in Jammu & Kashmir

Salal Hydroelectric Project (Chenab River)

Location: Reasi district, Jammu & Kashmir

Installed Capacity: 690 MW

Built By: NHPC (National Hydroelectric Power Corporation)

Controversy

Pakistan opposed construction, fearing it would allow India to manipulate water flow.

Project completed after India agreed to design modifications under IWT.

Baglihar Hydroelectric Project

Project Details

2. Baglihar Hydroelectric Project (Chenab River)

Location: Ramban district, Jammu & Kashmir

Installed Capacity: 900 MW (Stage I) + 450 MW (Stage II)

Dispute

Pakistan filed objection with World Bank, demanding international arbitration.

Neutral Expert (appointed under IWT) ruled mostly in India's favor (2007).

Significance

Set a legal precedent that India can construct "run-of-the-river" projects if it doesn't violate storage limits.

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3. Kishanganga Hydroelectric Project

330 MW

Installed Capacity

Power generation potential

1

Location

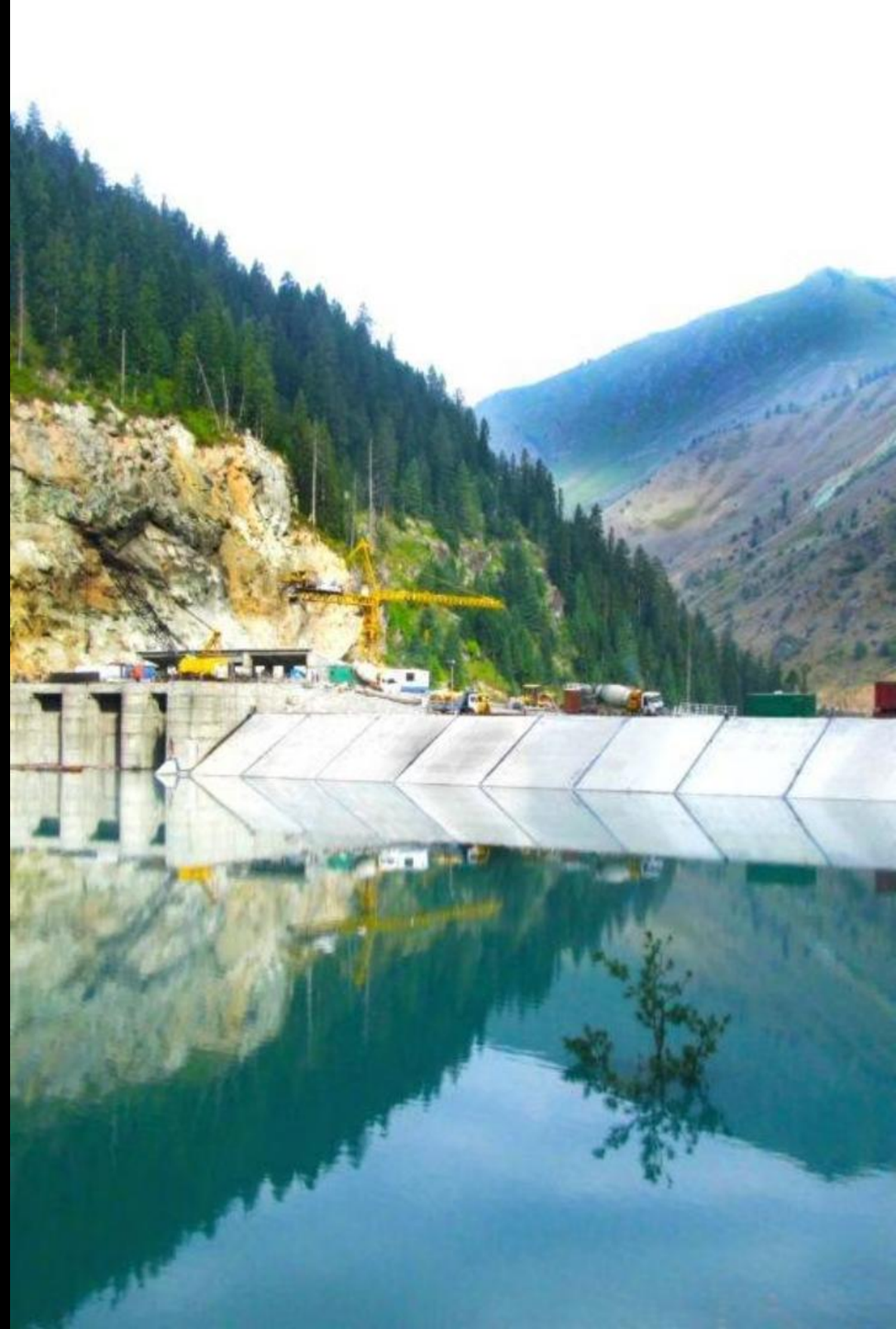
Bandipora district, Jammu & Kashmir

2

River

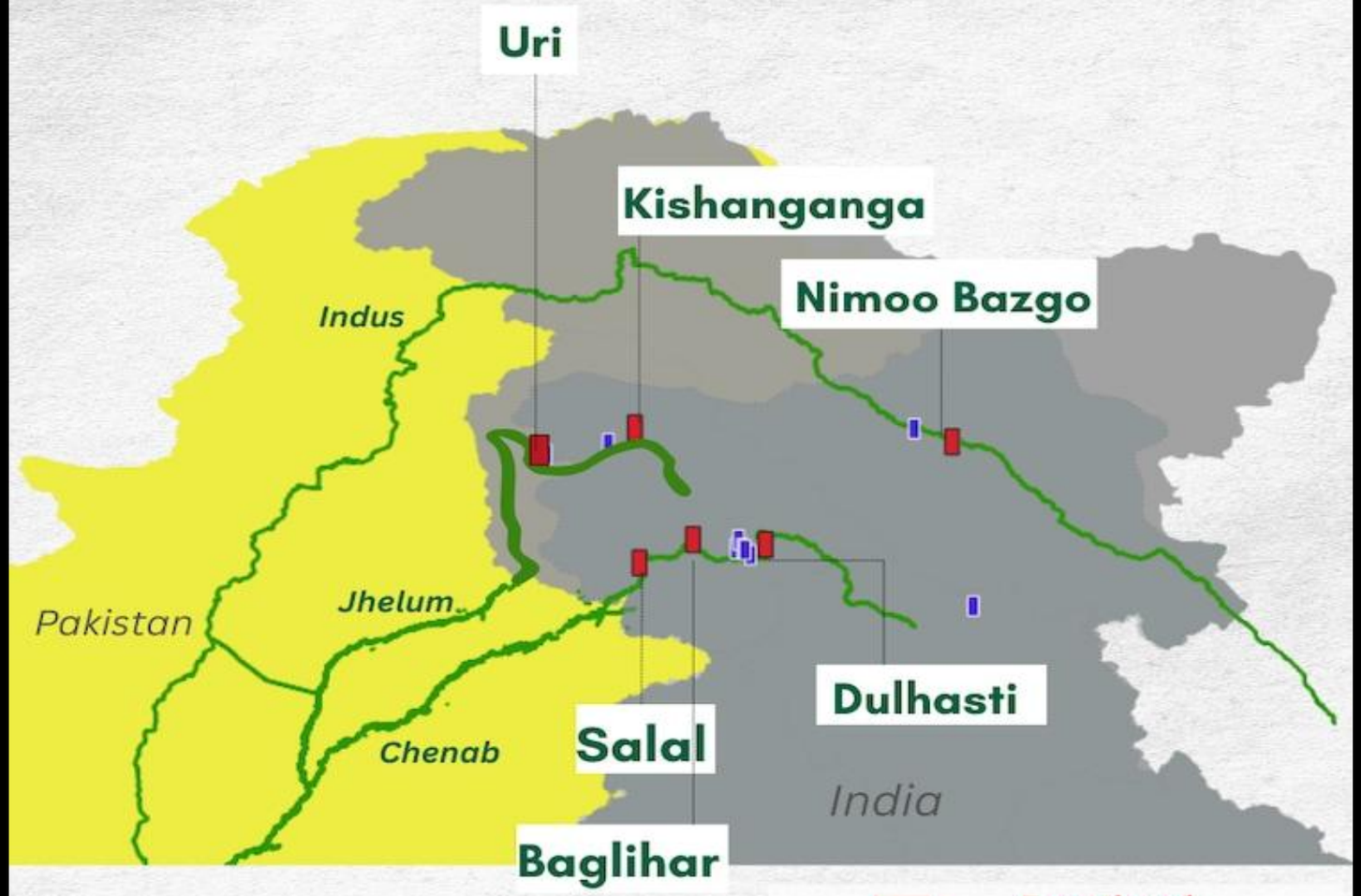
Kishanganga River, tributary of Jhelum

Technology: Diverts water from Kishanganga to a power plant, then to Wular Lake.



INDUS WATERS TREATY

Dams on Western Rivers in J&K



QSINT

Map Not To Scale

Pakistan's Legal Challenge

Legal Argument

Argued it violates IWT by altering river flow.

International Court

Took India to Permanent Court of Arbitration (PCA) at The Hague.

Verdict

PCA allowed diversion but mandated minimum environmental flow to Pakistan.

Precedent

Reaffirmed India's rights under IWT with ecological safeguards.

Hydroelectric Power Projects in Kishtwar: Pakal Dul, Ratle, Kiru, Kwar

AC

Chenab River Basin

The Chenab River originates in Himachal Pradesh and flows through Jammu & Kashmir before entering Pakistan, serving as the lifeline for the hydroelectric projects in Kishtwar.

1 **Major Tributaries**

Chandra, Bhaga, Marusudar, Ans, Tawi, and Jhelum rivers

2 **Hydroelectric Projects**

Pakal Dul, Ratle, Kiru, and Kwar

Why in News?

Government Initiative

The **Government of India** is **fast-tracking four hydroelectric power projects** in **Kishtwar**, Jammu & Kashmir, amid rising tensions with Pakistan over the **Indus Waters Treaty**.

Project Type

These are **run-of-the-river (RoR)** projects on the **Chenab River and its tributaries**.

Key Projects

The projects include:

- **Pakal Dul (1,000 MW)**
- **Ratle (850 MW)**
- **Kiru (624 MW)**
- Kwar (540 MW)

Project Overview

Project	Capacity	Status	Location	Storage
Pakal Dul	1,000 MW	Under construction	Kishtwar (J&K)	Storage (first of its kind on Chenab)
Ratle	850 MW	Under construction	J&K	Run-of-the-river
Kiru	624 MW	Under construction	J&K	Run-of-the-river
Kwar	540 MW	Under construction	J&K	Run-of-the-river

🗓️ Completion Deadlines:

- **Pakal Dul**: December 2027
- **Kiru**: November 2028

Strategic Significance

Treaty Context

These hydro projects come after India placed the **Indus Waters Treaty (1960)** "in abeyance" post the **Pahalgam terror attack (April 22, 2025)** that killed 26 civilians.

Riparian Rights

India is asserting its riparian rights under the treaty and making full use of its share of the **Chenab River**.

Project Design

🌊 **Run-of-the-river projects** use natural flow and elevation drop to generate power. They typically have **limited water storage** and cause **minimal submergence**, making them less ecologically invasive but more flow-dependent.

PSUs and Joint Ventures Involved

Joint Venture

Chenab Valley Power Projects Private Ltd (CVPPPL)

Joint Venture between:

- **NHPC Ltd** (India's largest hydropower PSU)
- **J&K State Power Development Corporation (JKSPDC)**

International Collaboration

Pakal Dul specifically is being developed with foreign collaboration including **Austrian and Chinese firms** (engineering consultation)

NHPC Ltd Details

CMD: **Shri Raj Kumar Chaudhary** (as of May 2025)

Ministry: **Ministry of Power, Government of India**

HQ: Faridabad, Haryana

Associated River: Chenab River

Origin

Originates: **Baralacha Pass**, Himachal Pradesh

Major Tributary

Marusudar (site of Pakal Dul dam)

Flow Path

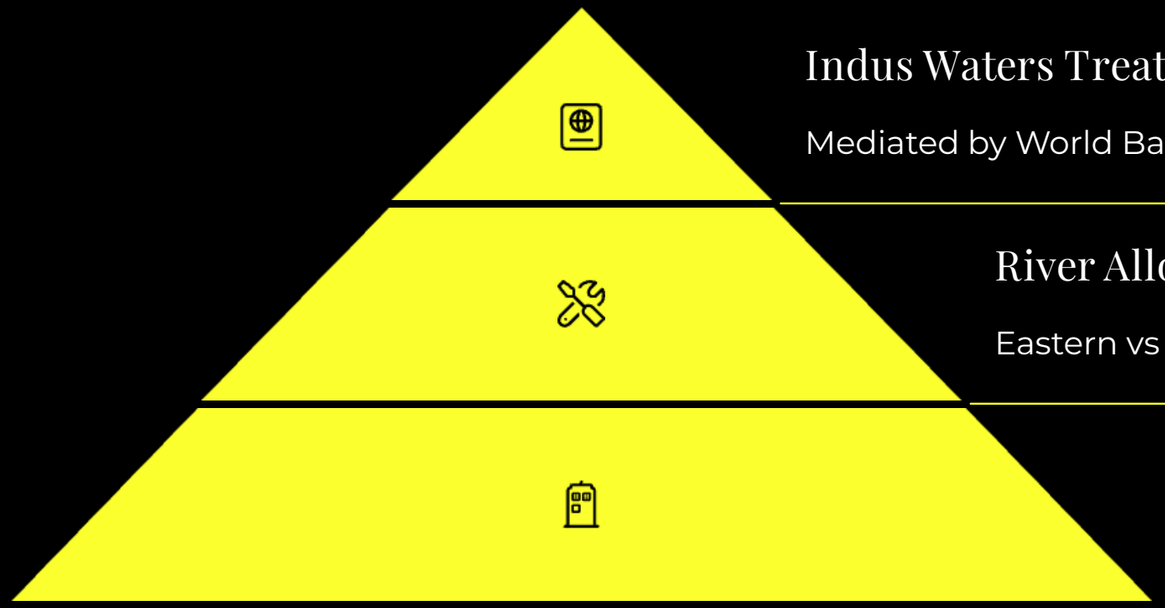
Flows through: J&K into Pakistan

Treaty Status

Forms part of the **Western Rivers** under the **Indus Waters Treaty**

Pakistan's rights to Chenab's waters under the IWT often lead to objections over these projects, especially if they include **storage** components like Pakal Dul.

Legal and Treaty Context



Indus Waters Treaty (1960)

Mediated by World Bank between India and Pakistan

River Allocation

Eastern vs Western rivers division

India's Position

Projects comply with treaty provisions

Eastern rivers (Ravi, Beas, Sutlej): Fully for India

Western rivers (Indus, Chenab, Jhelum): Primarily for Pakistan, but India allowed non-consumptive uses (hydro, irrigation, domestic)

India's position: RoR and limited storage projects **do not violate** IWT.

Recent **terror attack** and **Pakistan's support to cross-border terrorism** prompted India to signal **harder stance on water diplomacy**.

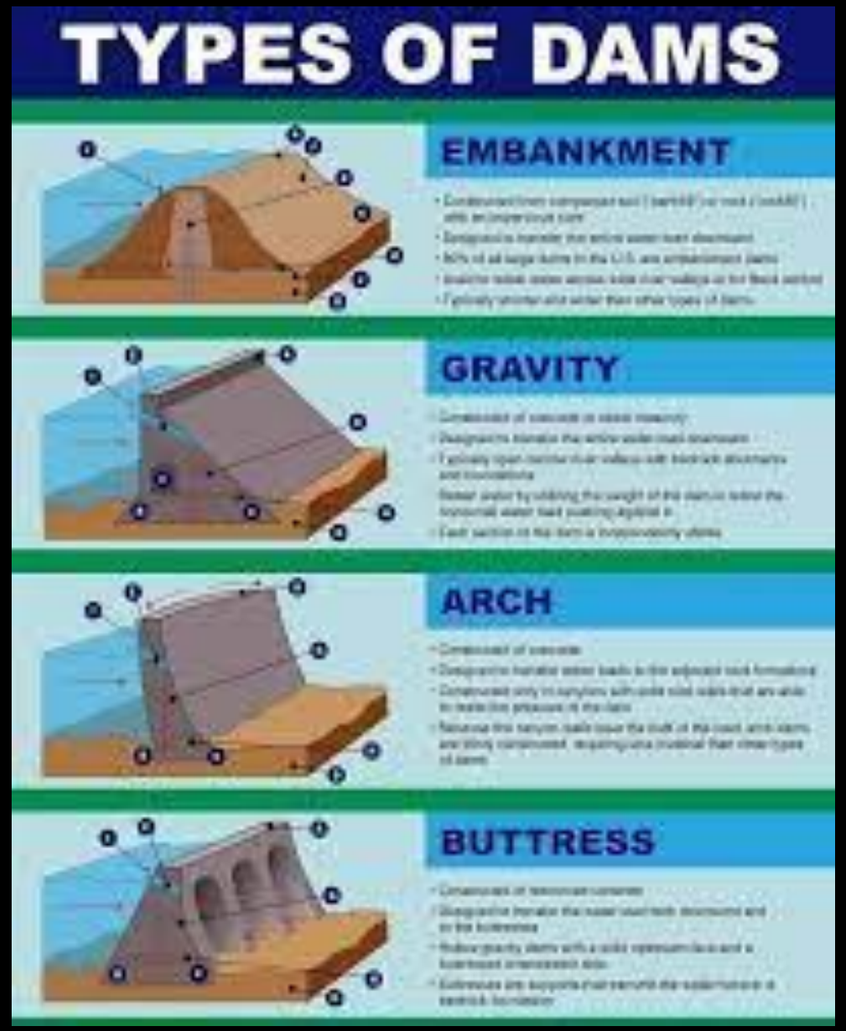
Dams of India

A dam is a structure built across a river or stream to hold back water. Over the centuries dams have been built using different materials.

AC

Major Dams in India

- Tehri Dam in Uttarakhand is the highest dam in India built on Bhagirathi river.
- Hirakud Dam in Odisha built on river Mahanadi is the longest dam of India.
- Kallanai Dam in Tamil Nadu is the oldest dam of India. It is built on the Kaveri river and is about 2000 years old.



Types of Dams

Based on Structure and Material

A. Gravity Dam

Material: Concrete or stone masonry

Design: Relies on its weight to resist water pressure

Example: Bhakra Nangal Dam (Himachal Pradesh)

B. Arch Dam

Material: Concrete

Design: Curved structure transferring water pressure to the abutments

Example: Idukki Dam (Kerala)

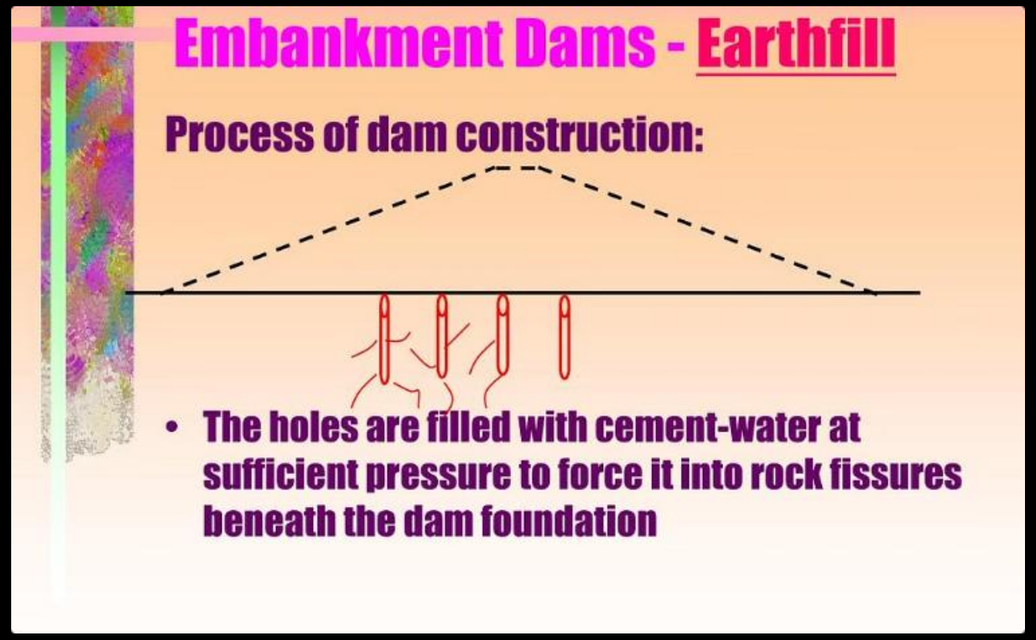
C. Buttress Dam

Material: Reinforced concrete

Design: Inclined deck supported by triangular buttresses

Example: Nagarjuna Sagar Dam (Telangana)

Types of Dams



D. Earthfill (Embankment) Dam

Material: Natural earth/soil

Design: Impermeable core with sloping sides

Example: Hirakud Dam (Odisha)

E. Rockfill Dam

Material: Rock fragments

Design: Similar to earthfill but uses rock as the main material

Example: Tehri Dam (Uttarakhand)

Based on Purpose

Storage Dam

Stores water for irrigation, drinking, etc. (e.g., Sardar Sarovar Dam)

Hydroelectric Dam

Generates electricity (e.g., Bhakra Dam)

Diversion Dam

Diverts water for irrigation (e.g., Mettur Dam)

Detention Dam

Controls floodwaters (e.g., Ukai Dam)

Bhakra Nangal Dam

River

Built on the Sutlej River

States

Located on the border of Himachal Pradesh and Punjab

Type of Dam

Concrete gravity dam

Height

226 meters (one of the highest in Asia)

Purpose

Multipurpose – Irrigation, Hydro Power, Flood Control, Drinking Water

Bhakra Nangal Dam

Forms the Gobind Sagar Reservoir

Constructed in 1963

Operated by the Bhakra Beas Management Board (BBMB)

Often termed as the "Temple of Modern India" by Jawaharlal Nehru

Irrigation Benefits

Irrigates over 10 million acres in Punjab, Haryana, and Rajasthan

Ensures year-round water supply for agricultural productivity

Vital for the Green Revolution in North India

Tehri Dam

River

Built on the Bhagirathi River

State

Located in Uttarakhand, India

Type of Dam

Rock and Earth-fill embankment dam

Height

260.5 meters – Tallest dam in India

Purpose:

- Hydroelectric Power Generation – Capacity of 1,000 MW (Tehri Hydro Power Complex)
- Irrigation – Provides irrigation to around 2.7 lakh hectares of land
- Drinking Water – Supplies water to Delhi, Uttar Pradesh, and Uttarakhand
- Flood Control – Helps in moderating floods in the downstream Ganga basin

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Tehri Dam

- Constructed by THDC India Ltd.
- Foundation laid in 1978
- Completed in 2006

It forms the Tehri Reservoir, also called Tehri Lake

A major component of India's clean energy and water management projects


UTTARKASHI
Miani
Chham
Dhanolti
Pinswar
Gangi
Thati Kathur
Gawana
Lambgaon
Pratapnagar
CHAMOLI
NEW TEHRI
Ghansyali
Kurchhola
Moinau
To Rudraprayag
DEHRADUN
Ampata
Dangchaunra
58
Alaknanda
Narendranagar
Muni ki reti
Shivpuri
Devaprayag
To Haridware
PAURI

Sardar Sarovar Dam

River

Built on the Narmada River

State

Located in Gujarat, near Navagam in the Narmada district

Type of Dam

Concrete gravity dam

Height

163 meters (completed in 2017)

Irrigation: Provides irrigation to over 18 lakh hectares of land in Gujarat, Madhya Pradesh, Maharashtra, and Rajasthan

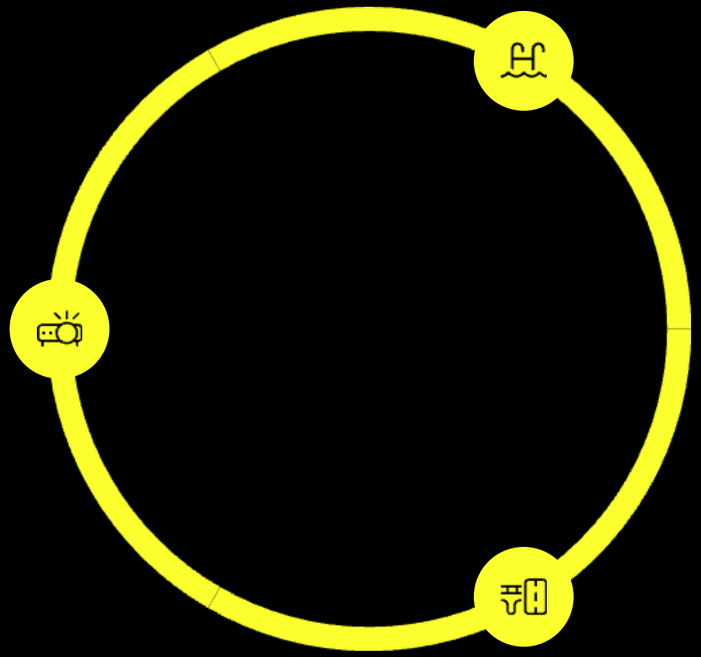
Purpose: Multipurpose project—irrigation, drinking water supply, hydroelectric power, and flood control

Hydropower Capacity: Around 1,450 MW

Sardar Sarovar Dam

Narmada Valley Project

It is part of the Narmada Valley Project and is one of the largest dams in India



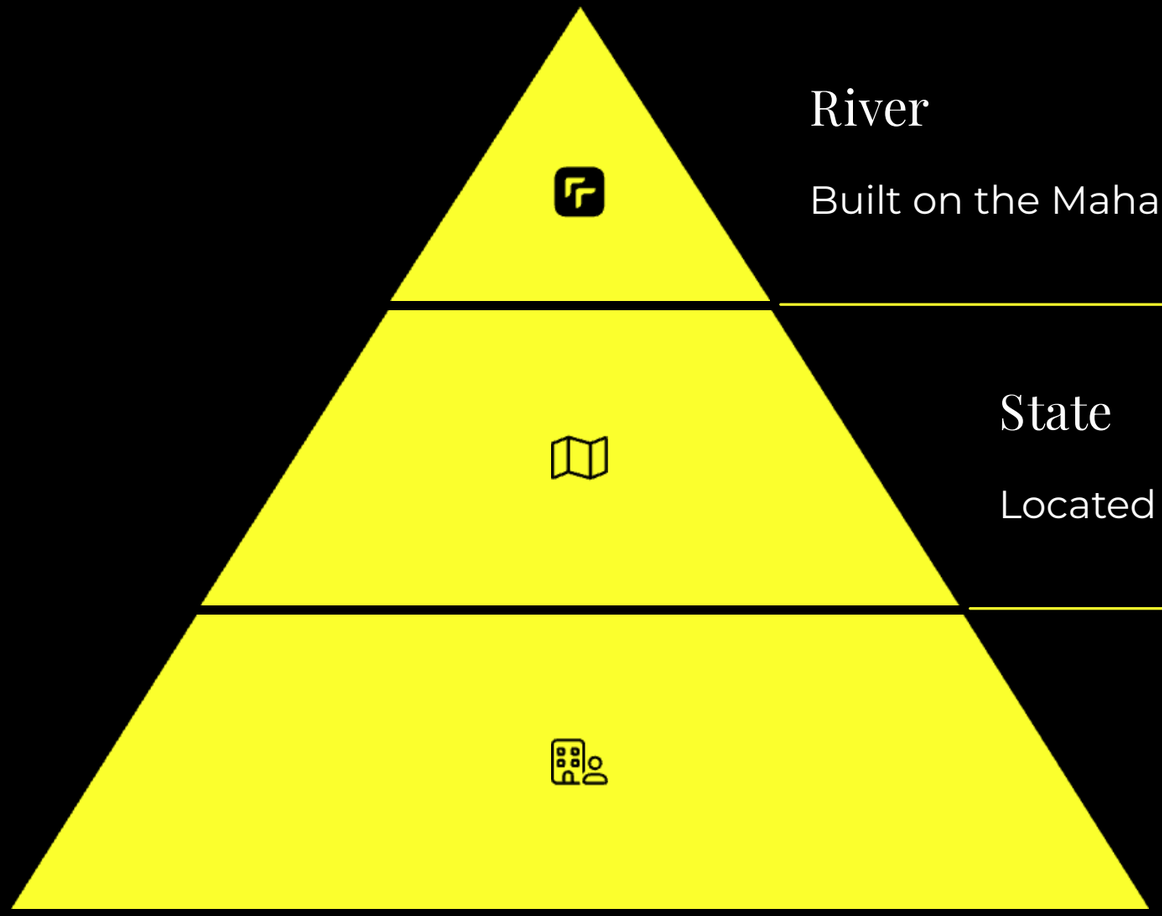
Water Management

Vital for water management in western India

Infrastructure

A key infrastructure project for drought-prone regions

Hirakud Dam



River

Built on the Mahanadi River

State

Located in Odisha, near Sambalpur

Type of Dam

Composite dam (comprising earth, concrete, and masonry sections)

Hirakud Dam

World's longest earthen dam

Approximately 25.8 km including dykes

Constructed in 1957

One of the first major multipurpose river valley projects in India

Multiple Benefits

Provides flood control, hydropower, and irrigation

Houses two main powerhouses generating hydroelectric power

Agricultural Impact

Irrigates over 2.5 million acres of land in Odisha and Chhattisgarh

Supports rice, pulses, and other crops, vital for agriculture in the region

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Nagarjuna Sagar Dam

River	Built across the Krishna River
State	Located on the border of Telangana and Andhra Pradesh
Type of Dam	Masonry dam (one of the world's largest)
Height	Approximately 124 meters
Length	Around 1.6 kilometers
Year of Completion	1967

One of the earliest multi-purpose irrigation and hydroelectric projects in independent India. Houses a hydroelectric power station with multiple turbines.

Nagarjuna Sagar Dam

Agricultural Impact

Provides irrigation to over 10 lakh hectares of farmland in Telangana and Andhra Pradesh

Economic Importance

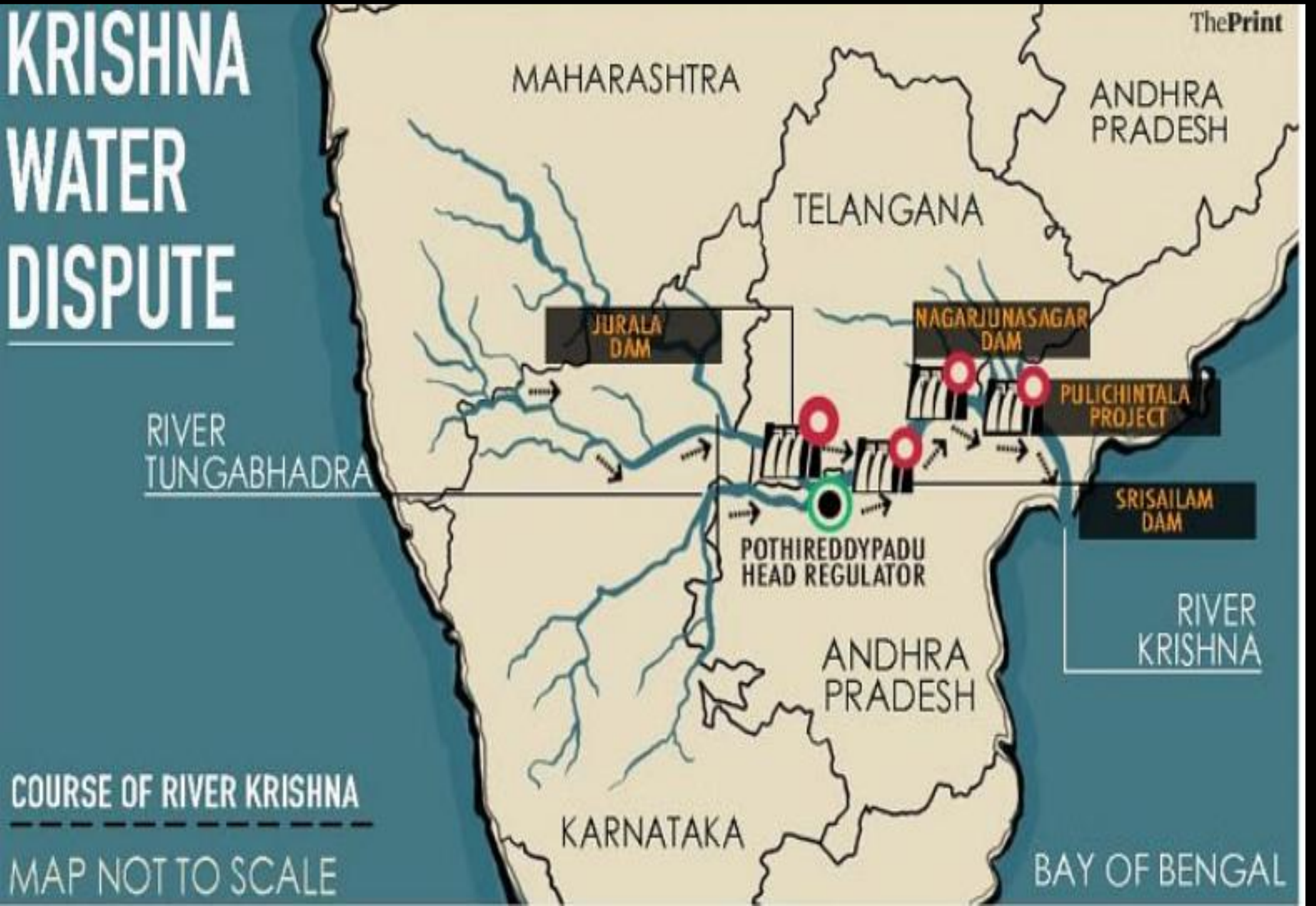
Vital for the agricultural economy of the region, especially for paddy and cotton cultivation

Reservoir

The reservoir formed is called Nagarjuna Sagar Reservoir, one of the largest in India

Regional Development

Boosts drinking water supply, electricity generation, and regional development



Indira Sagar Dam

River

Narmada River

State

Madhya Pradesh

Type of Dam

Concrete gravity dam

Located in Khandwa district. It is one of the largest reservoirs in India by volume. The dam has a height of 92 meters and a length of 653 meters.

Indira Sagar Dam

Inaugurated in 2005

Irrigation

Provides irrigation to approximately 1.23 lakh hectares of agricultural land

Hydropower

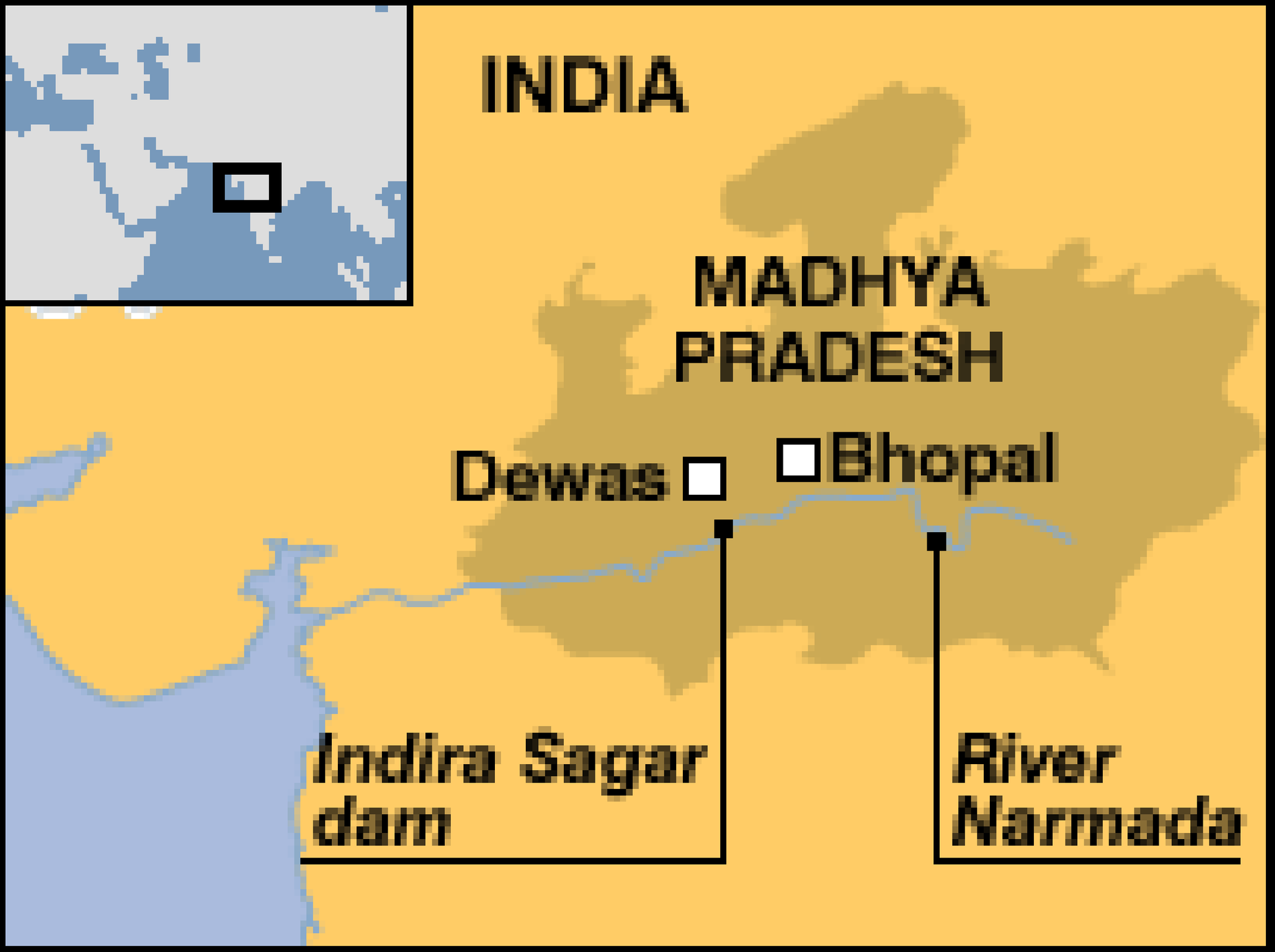
Installed hydropower capacity of 1,000 MW (4 units of 250 MW each)

Water Management

Helps in water management and agricultural development in the region

Aids in flood control and water supply.

Indira Sagar Dam is a key component of the Narmada Valley Development Project,



Krishna Raja Sagar

Location

Built on the Cauvery River

Located in Mandya district, Karnataka

History

Constructed in 1932

Named after Maharaja Krishna Raja Wadiyar IV

Designed by Sir M. Visvesvaraya, a renowned engineer

Dimensions

Height: Approximately 39.8 meters

Length: Around 2,620 meters

Impact

Created the KRS Reservoir

Key Functions

Irrigation

Supplies water to Mandya, Mysuru, and parts of Tamil Nadu

Hydropower

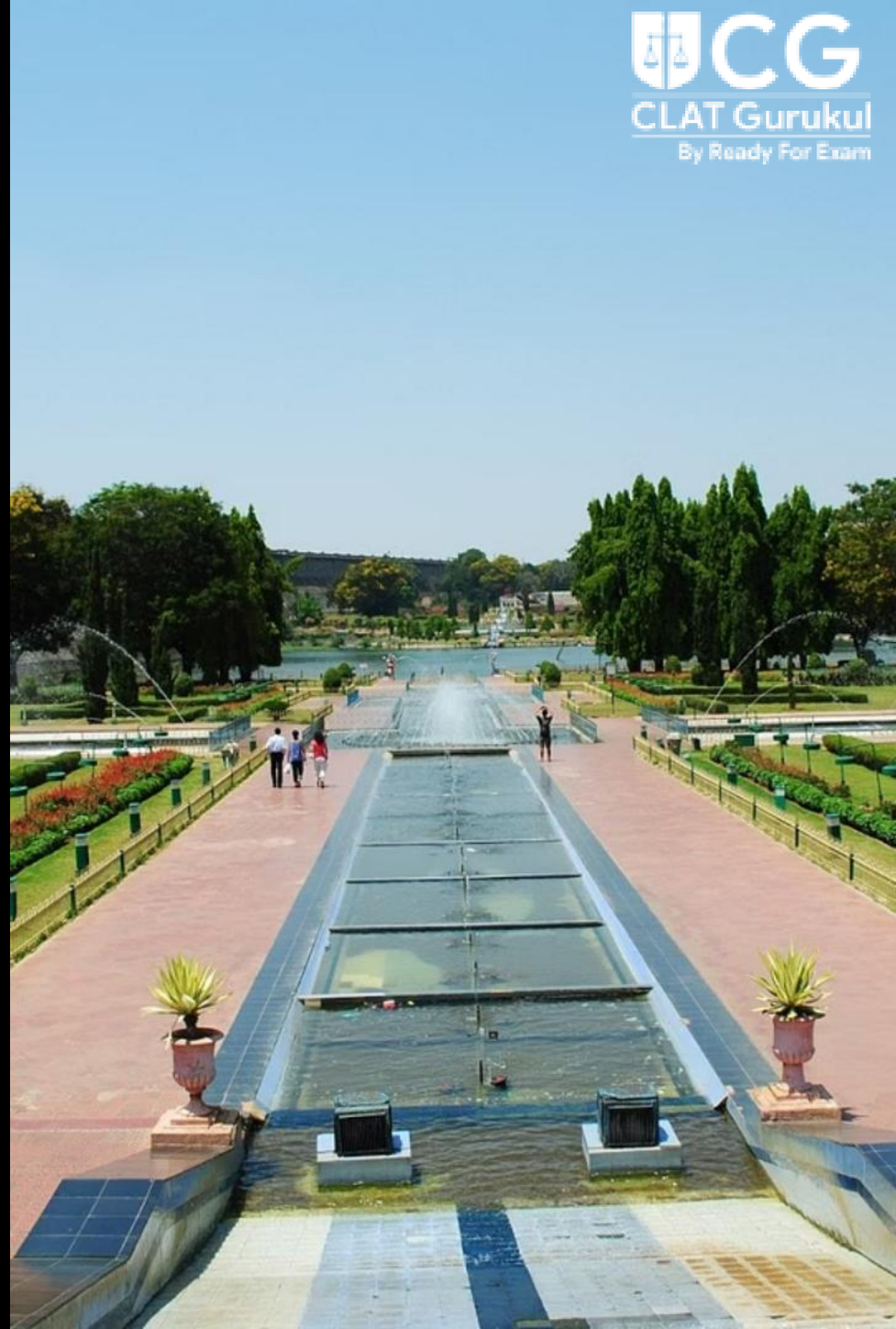
Supports hydroelectric generation

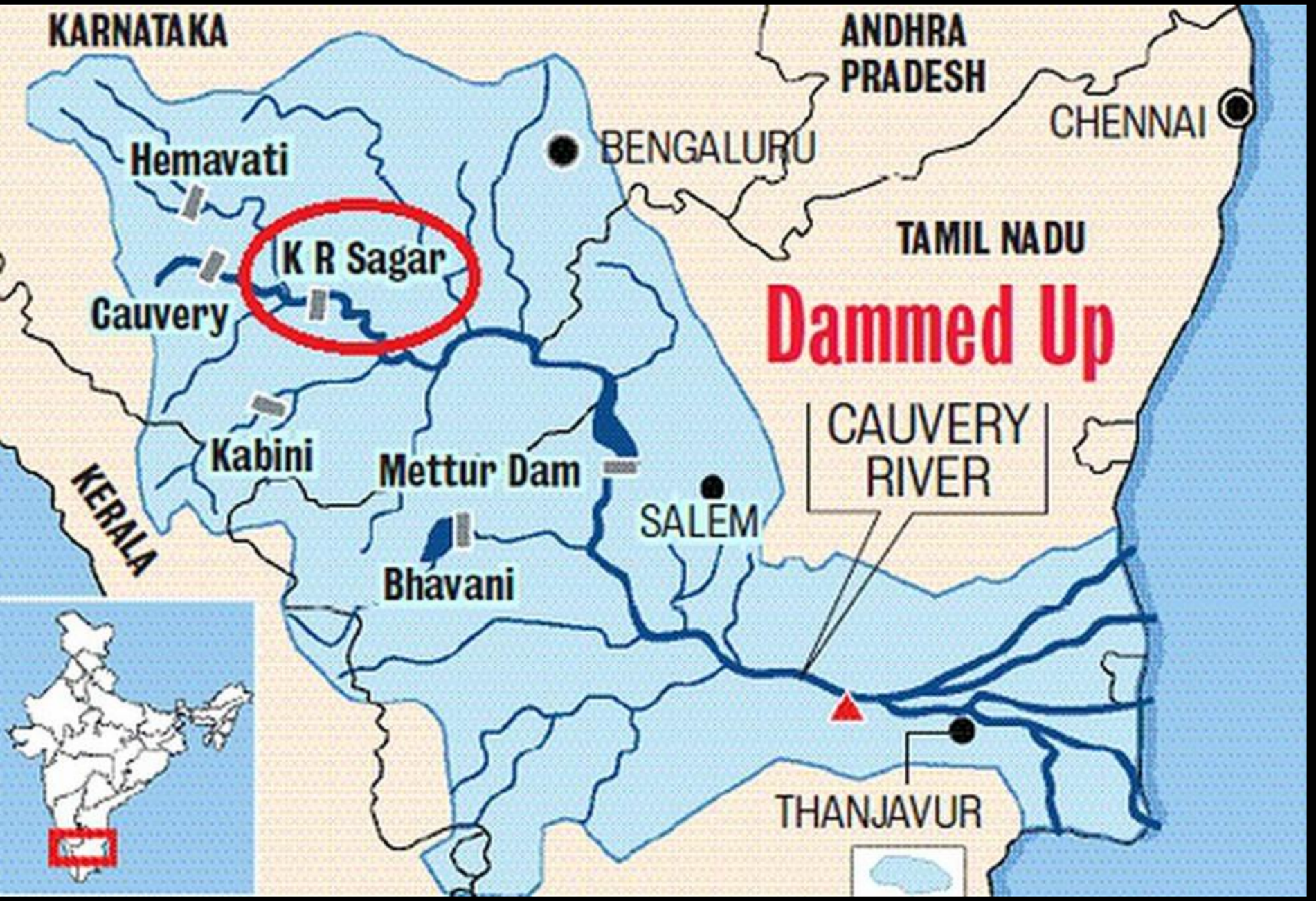
Flood Control

Helps manage seasonal flow variations

Tourism and Public Interest Famous Brindavan Gardens located nearby

Strategic and Legal Relevance Central to the Cauvery Water Dispute between Karnataka and Tamil Nadu





Idukki Dam

Location Details

State: Kerala

District: Idukki

River: Periyar River

🏗️ Dam Specifications

Type: Double curvature arch dam

Height: 168.91 metres (554 feet)

Length: 365.85 metres

Construction Completed: 1975

Commissioned: 1976

Associated Dams: Cheruthoni and Kulamavu (part of the Idukki Hydroelectric Project)

Purpose and Utility

Primary Purpose

Hydroelectric power generation

Power Plant Capacity: 780 MW (Idukki Hydroelectric Project)

Irrigation

Supports nearby agricultural areas

Drinking Water

Supplies water to nearby towns and villages

Flood Control

Managed by Cheruthoni Dam (Idukki Dam has no spillways)

- Significance Meets approximately 66% of Kerala's electricity needs

Boosts regional economic development and agriculture

Significance of Dams

Source of Clean Energy

Dams harness the power of flowing water to generate renewable hydroelectric energy, providing a sustainable alternative to fossil fuels.

Irrigation

Dams store water that can be channeled through irrigation systems to agricultural lands, enabling year-round farming and increased crop yields.

Prevent Flooding

By regulating water flow, dams help control seasonal flooding that could otherwise devastate downstream communities and farmlands.

Source of Drinking Water

Reservoirs created by dams serve as reliable sources of drinking water for urban and rural communities, especially during dry seasons.

Negative Impacts of Dams

Affect the Aquatic Life

Dams disrupt natural river ecosystems and can prevent fish migration, threatening native species.

Older Dams are Greater Hazard

Aging infrastructure poses safety risks including potential dam failures and flooding.

Dams block Rivers

By impeding natural water flow, dams alter downstream habitats and can cause river fragmentation.

Displacement of People

Construction of large dams often requires relocating communities from areas that will be submerged.

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Konkan Railway Merger with Indian Railways

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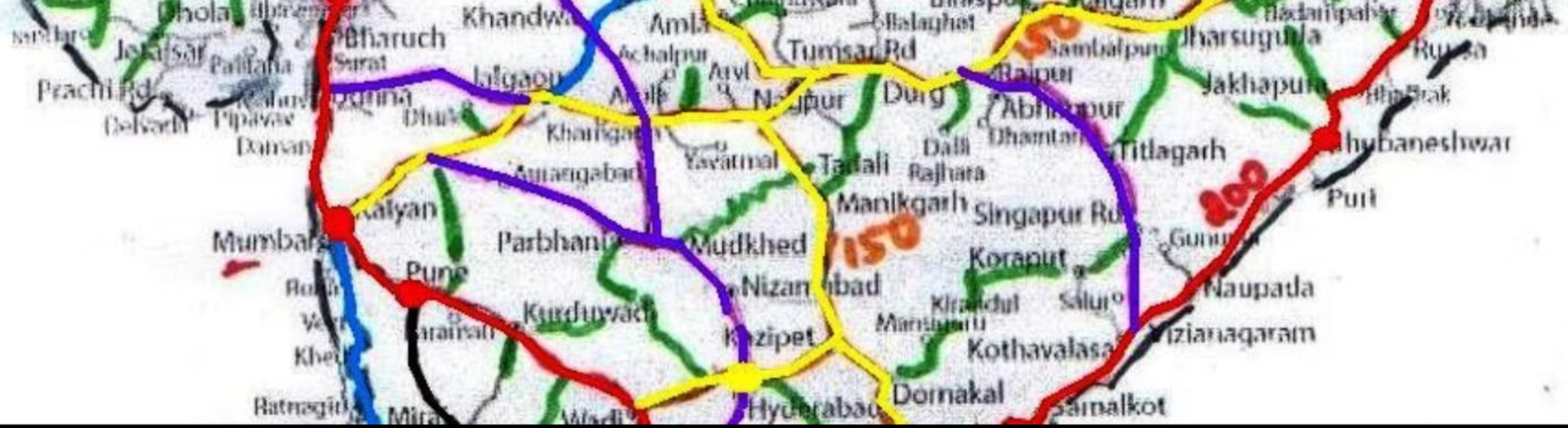

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Why in News?

In May 2025, the **Konkan Railway Corporation Limited (KRCL)** received final approval from Maharashtra for its **merger with Indian Railways**, after Goa, Karnataka, and Kerala had already consented. This is a significant development in Indian railway infrastructure integration.

Final Approval from Maharashtra

Received in May 2025, following consent from Goa, Karnataka, and Kerala.

Significant Development

Crucial for Indian railway infrastructure integration.

About Konkan Railway

Established

1990, as a **special purpose vehicle (SPV)** under the Ministry of Railways.

Operational Since

January 1998.

Route Coverage

Roha (Maharashtra) to Thokur (Karnataka), traversing through Goa and touching Kerala.

Distance

741 km.

Engineering Feats

Over **91 tunnels**, 2,000+ bridges including the **Panvalnadi viaduct** (one of the tallest in Asia).

Topography

Built across the Western Ghats and Konkan coast, known for landslides, requiring robust design.

Why Was the Merger Needed?

Funding Constraints

KRCL lacked the financial muscle to support expansion and modernization.

Operational Limitations

As an SPV, it could not tap into the large-scale budgetary allocations and resources of Indian Railways.

Merger Objective

To bring the Konkan route under the operational and administrative control of Indian Railways to improve performance, safety, and infrastructure funding.

Structure Before Merger

Government of India – 51%

The central government held the majority stake in Konkan Railway Corporation Limited before the merger.

Maharashtra – 22%

The state of Maharashtra was the second largest stakeholder in the railway corporation.

Karnataka – 15%

Karnataka held a significant portion of shares in the Konkan Railway project.

Goa – 6%

Despite being a smaller state, Goa was an important stakeholder in the railway corporation.

Kerala – 6%

Kerala held an equal share to Goa in the Konkan Railway Corporation Limited.

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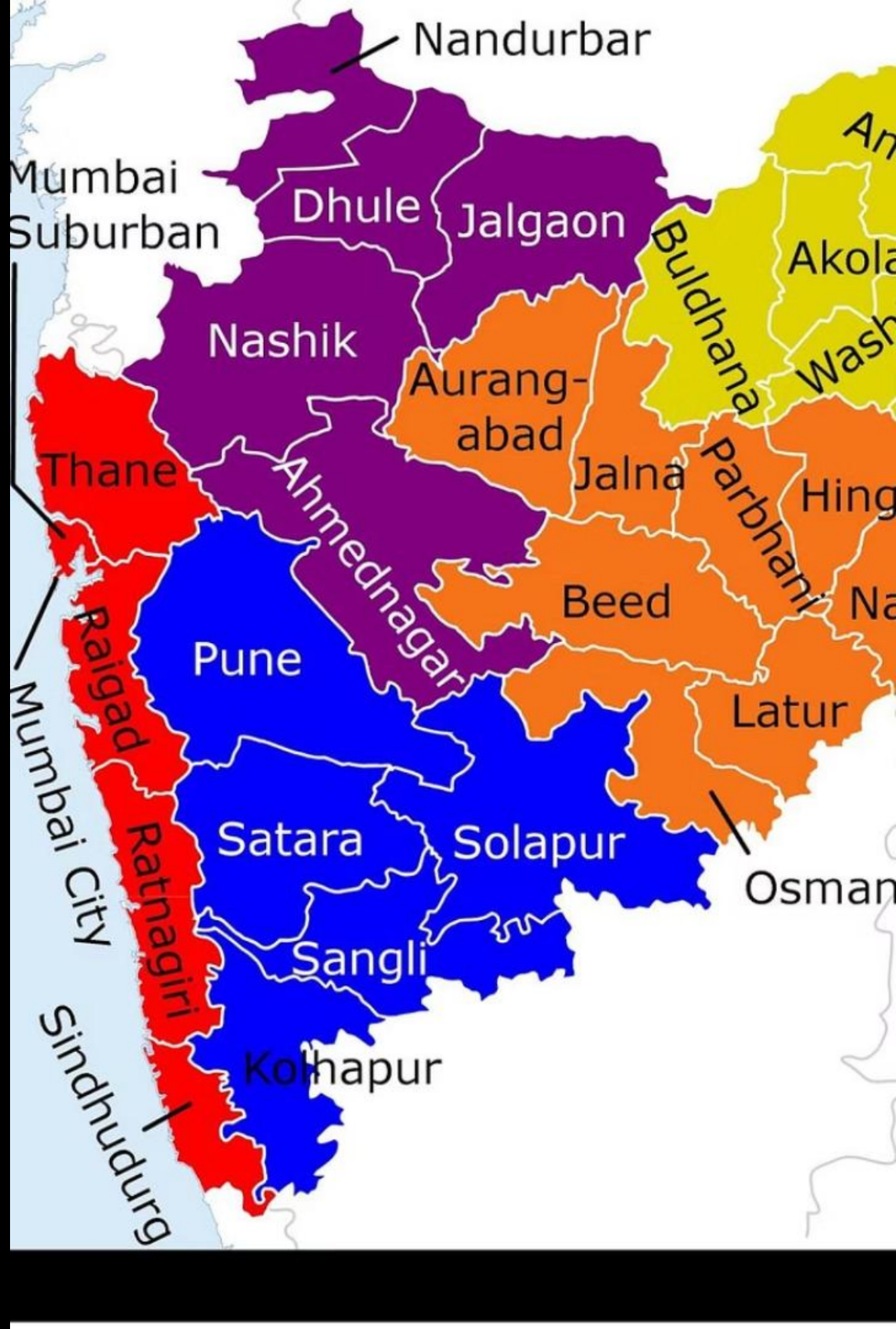
Conditions Put Forth by Maharashtra

Name Retention

"Konkan Railway" should continue to exist as a brand or operational identity.

Investment Reimbursement

Indian Railways should reimburse Maharashtra's investment of **₹394 crore**, made over several years.



Passenger & Operational Benefits

Unified Ticketing System

KRCL services now accessible via Indian Railways platforms like IRCTC.

Higher Investment Flow

Increased funds for track doubling, electrification, and new rakes.

Integrated Grievance System

Seamless complaint resolution under Indian Railways' unified portal.

Improved Train Frequency

National-level planning will lead to better train deployment.

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National Significance

Strategic Coastal Link

Vital for connecting Mumbai, Goa, and southern states; improves freight and tourism corridors.

Disaster Management Integration

Better coordination during monsoons and landslides through IMD and NDRF collaboration.

Part of Gati Shakti Vision

Streamlining of transport infrastructure under PM Gati Shakti Master Plan.

Dr. K. Kasturirangan (1940–2025): A Visionary Scientist and Education Reformer

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Life and Career Overview

Dr. K. Kasturirangan, one of India's most respected space scientists and educationists, passed away on 25th April 2025 at the age of 84. His career spanned significant contributions in space science, policy-making, education reform, and governance.

Distinguished Scientist

Renowned for his contributions to India's space program and scientific advancement

Education Reformer

Led transformative changes in India's education system through policy development

Policy Maker

Influenced national development through various governmental and academic roles

- Key Highlights of His Life and Work

ISRO Leadership

ISRO Chairman

🚀 Space Research Leadership (ISRO)

Served as Chairman of ISRO from 1994 to 2003.

Space Program Development

Led India's space program during a critical growth period

Global Recognition

Established India's reputation in the international space community

Space Projects and Achievements

Satellite Programs

- INSAT-2 series (communications)
- IRS satellites (earth observation)
- Bhaskara-I & II (experimental earth observation)

Launch Vehicle Development

- Oversaw the development of PSLV and GSLV launch vehicles.

Lunar Exploration

- Played a key role in the conceptualization of Chandrayaan-1, India's first moon mission.

Global Impact

- Positioned India as a major global space power.

National Education Policy Contributions

📚 Educational Reforms

Headed the Committee for drafting the National Education Policy (NEP) 2020, a landmark reform in India's educational framework, emphasizing:

Critical Thinking

Emphasis on analytical skills development

Multidisciplinary Education

Holistic approach to learning across subjects

Mother Tongue Education

Early education in native language

Constitutional Values

Foundation in Indian democratic principles

- Holistic and multidisciplinary education.
- Mother tongue-based early education.
- Emphasis on critical thinking and Constitutional values.

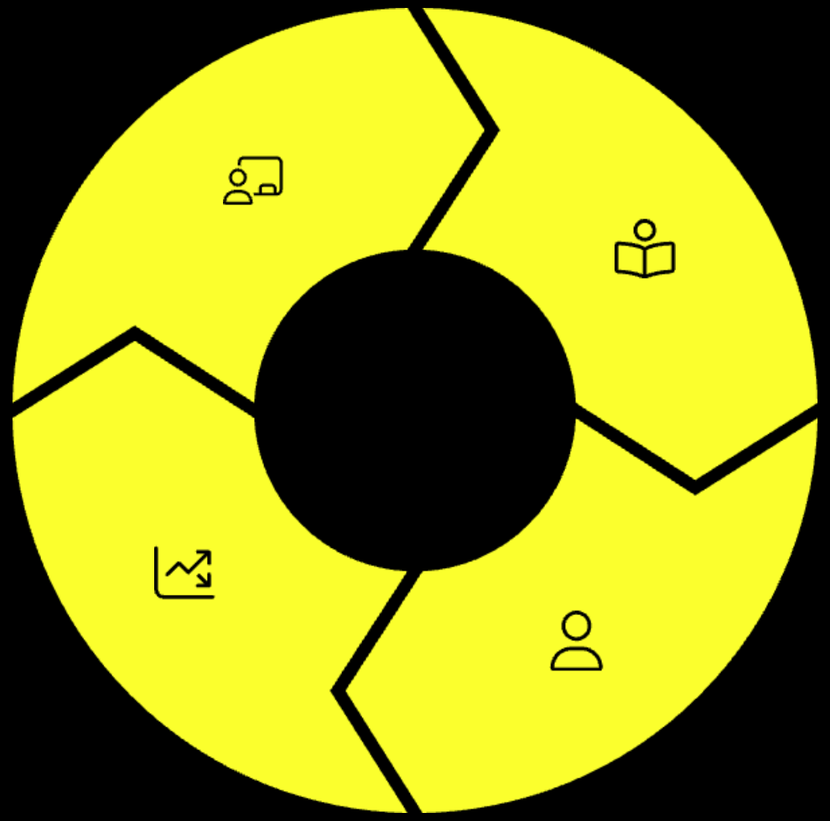
Curriculum Framework Leadership

Pedagogy Reform

Modern teaching methodologies

Assessment Reform

Improved evaluation systems



Textbook Development

Updated educational materials

Teacher Training

Professional development programs

Chaired the Steering Committee for National Curriculum Framework (NCF) in 2021, guiding school textbook and pedagogy reforms nationwide.

Policy and Governance Contributions

Rajya Sabha

Member from 2003–2009

Planning Commission

Influenced national development

Science Advocacy

Contributed to policy debates

Education Reform

Championed educational improvements

🏛️ Roles in Policy & Academia

Member of Rajya Sabha (2003–2009) – contributing to science and education debates.

Former Planning Commission member – influencing national development planning.

Academic Leadership Positions

Central University of Rajasthan

Served as Chancellor

NIIT University

Served as Chancellor

Jawaharlal Nehru University

Former Chancellor

National Institute of Advanced Studies

Director at Bengaluru campus

Karnataka Knowledge Commission

Served as Chair

Raman Research Institute Trust

Trustee promoting foundational research

Served as:

- Chancellor of Central University of Rajasthan and NIIT University
- Former Chancellor of Jawaharlal Nehru University
- Director, National Institute of Advanced Studies, Bengaluru.
- Chair, Karnataka Knowledge Commission.

Trustee, Raman Research Institute Trust – promoting foundational research.

Awards and Scientific Contributions

3	240+	84
Civilian Honours	Research Papers	Years of Life
India's highest civilian awards received	Publications in astrophysics and space applications	A lifetime of scientific contributions (1940-2025)

- Awards and Recognition

Decorated with India's top three civilian honours:

- Padma Shri
- Padma Bhushan
- Padma Vibhushan

Published over 240 research papers in astrophysics and space applications.

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Dr. M R Srinivasan – Architect of India's Nuclear Power Programme

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Why in News?

Dr. **M R Srinivasan**, India's pioneering nuclear scientist and former Chairman of the **Atomic Energy Commission (AEC)**, passed away in May 2025 at the age of 95. He was recently active enough to be re-inducted into the AEC, highlighting his enduring relevance in India's nuclear energy sector.

Who was M R Srinivasan?

- Born: 1930 | Died: 2025
- Field: Mechanical Engineer and Nuclear Technologist
- Joined Department of Atomic Energy (DAE): 1955, at the age of 25
- AEC Chairman: 1987
- One of the first-generation nuclear technologists in India

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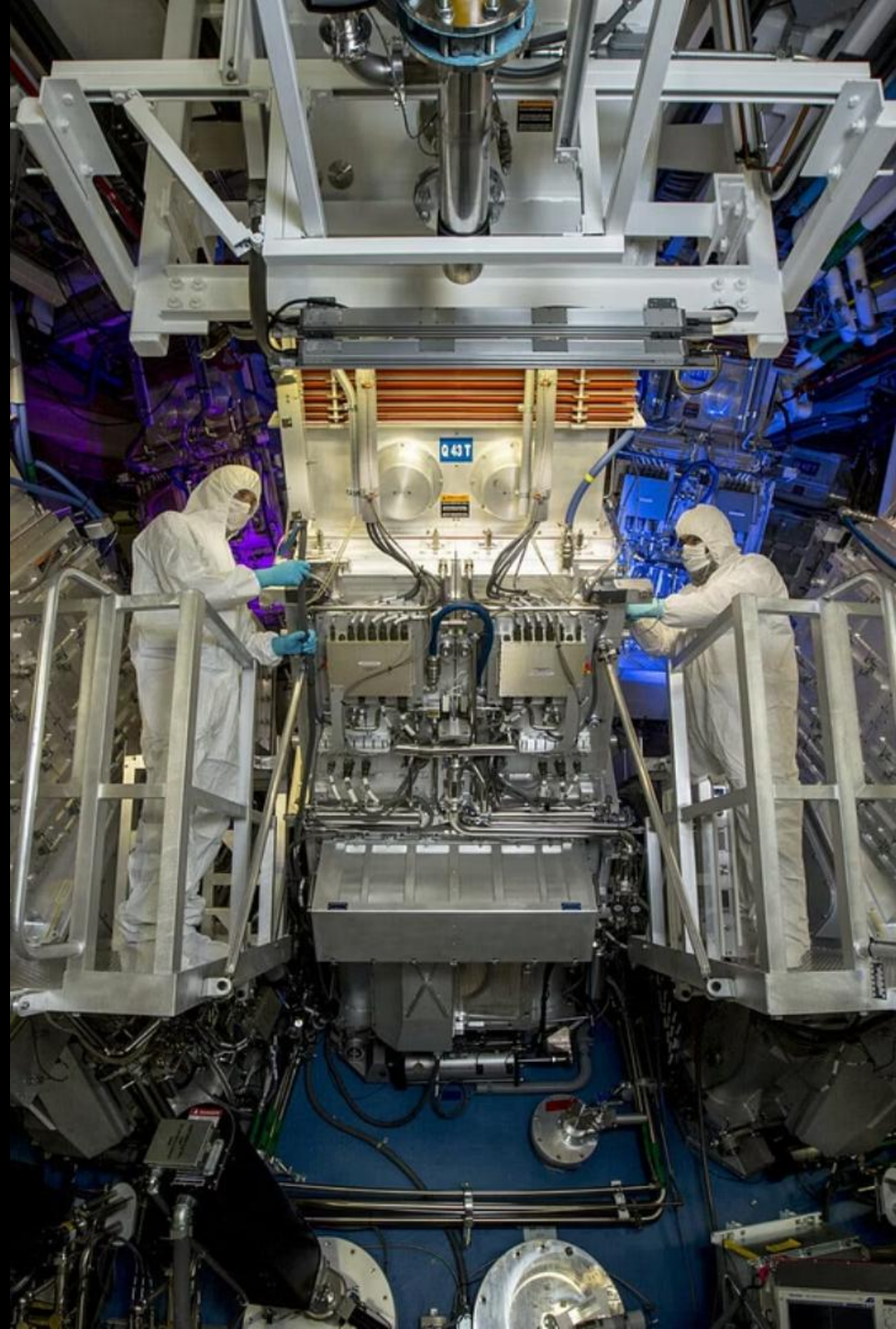
Key Contributions to India's Nuclear Programme

Heavy Water Reactor Technology

Key role in refining and adapting **Pressurised Heavy Water Reactors (PHWRs)** for Indian conditions.

Backbone of Civilian Programme

PHWRs became the **backbone of India's civilian nuclear programme**.



Contributions to Energy Security and Leadership

India's Energy Security

Enabled indigenous self-reliance by promoting **critical infrastructure** and **home-grown nuclear technology**.

Involved in every major nuclear power plant thereafter including **Rawatbhata, Kaiga, Kakrapar, Narora**, and **Kalpakkam**.

Institutional Leadership

Played a central role in the setting up of **Nuclear Power Corporation of India Limited (NPCIL)** in 1987.

Served as **Chairman of AEC** and was deeply engaged in nuclear policymaking.

Historical Legacy

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1950s

Part of the team behind India's **first nuclear research reactor APSARA** in the 1950s.

1960s

Participated in **building the Tarapur** nuclear plant (India's first large nuclear power plant in the 1960s).

1970s

Led India's nuclear programme during a crucial phase post-**1974 Pokhran nuclear test**.

1980s onwards

Played a key role in India's **transition from Canadian dependency** to **indigenous nuclear development**.

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Narlikar's Challenge to Big Bang

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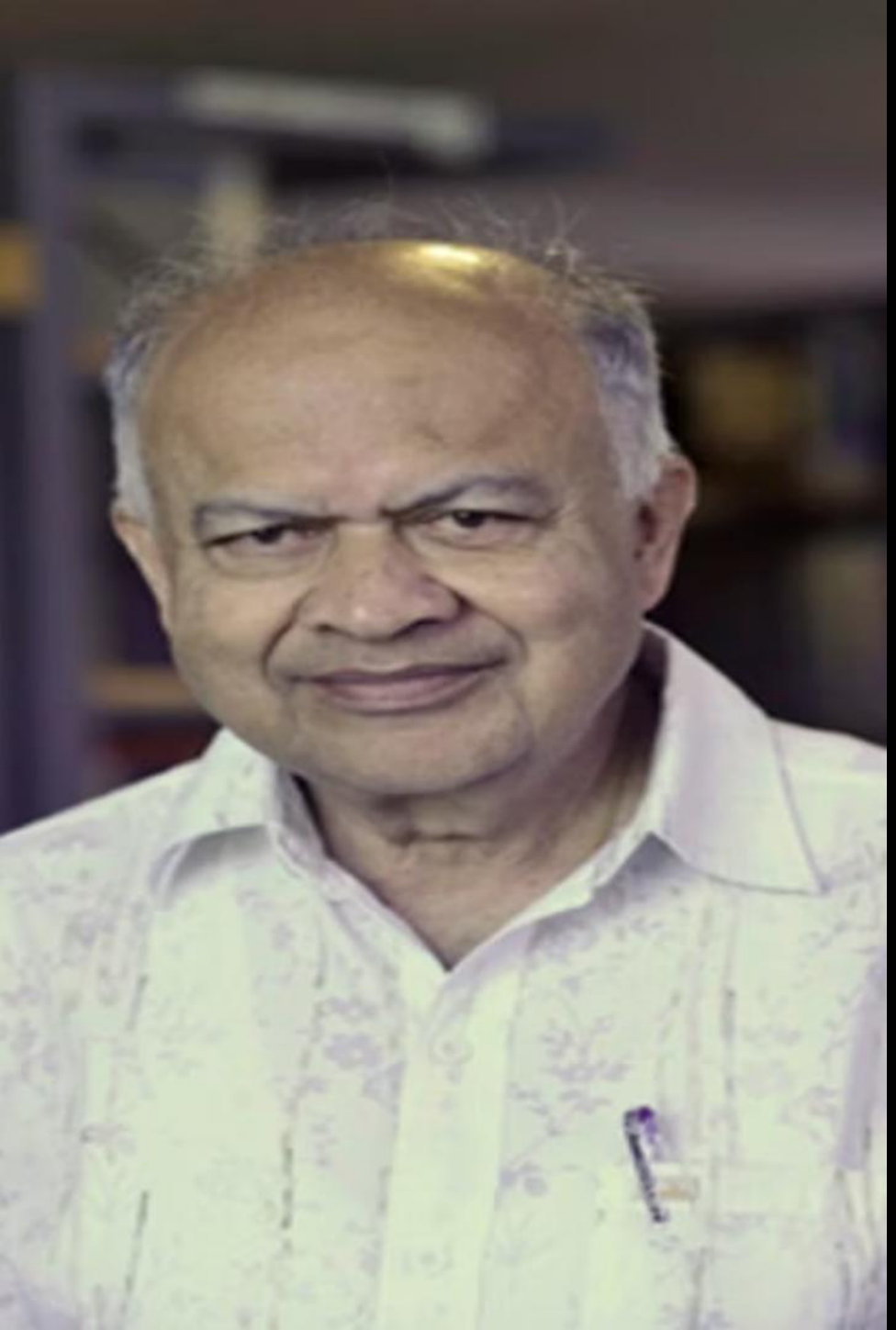

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Who Was Jayant Narlikar?

- Born in 1938, Kolhapur, Maharashtra, passed away in May 2025.
- One of India's most respected astrophysicists.
- Worked with Fred Hoyle at Cambridge University in the 1960s.
- Known for advancing the "Steady-State Theory" of the universe.

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What Was the Steady-State Theory?

Key Proponents

Proposed by **Fred Hoyle, Hermann Bondi, and Thomas Gold**, and extended by Narlikar.

Main Opposition

Opposed the **Big Bang Theory**, which says the universe originated from a single explosive event ~13.8 billion years ago.

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Steady-State Theory Claims

The universe has no beginning or end

it is **eternally existing and expanding**.

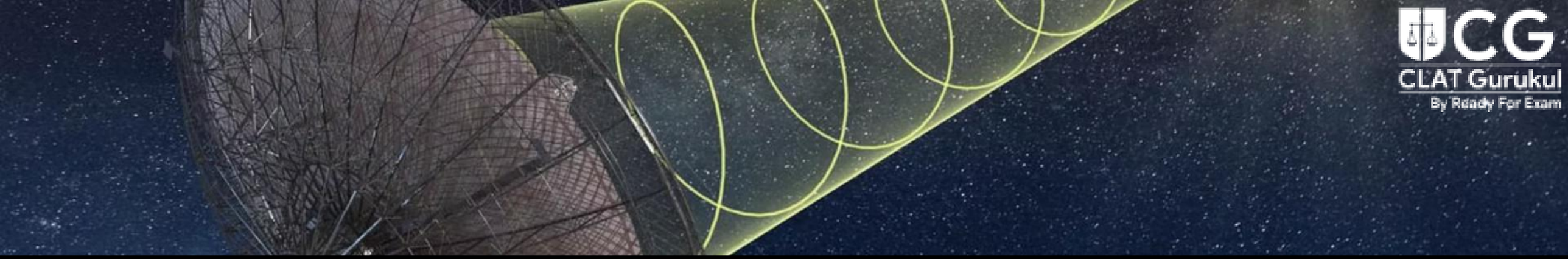
As it expands, new matter is continuously created

maintaining a constant density.

Narlikar's unique contribution: **Modified Einstein's General Relativity** to allow for the creation of new matter.

Key Differences: Steady-State vs Big Bang

Feature	Big Bang Theory	Steady-State Theory
Origin	Universe began from a singularity	Universe has no beginning or end
Expansion	Yes, with decreasing density	Yes, with constant density
Creation of Matter	No (fixed matter content)	Yes, new matter continuously created
CMB Radiation	Explained by Big Bang	Not adequately explained
Current Acceptance	Widely accepted	Largely outdated



Why the Steady-State Theory Declined

1

1965: CMB Discovery

The accidental discovery of **Cosmic Microwave Background (CMB) Radiation** supported the Big Bang model.

2

CMB as Proof

The **CMB** is the remnant heat from the early universe, considered solid proof of the Big Bang's explosive beginning.

3

Observational Evidence

As more **observational evidence** (e.g., redshift, expanding universe, galaxy formation) supported the Big Bang, the Steady-State model lost prominence.

Narlikar’s Contributions to Cosmology

Refining Mathematical Models

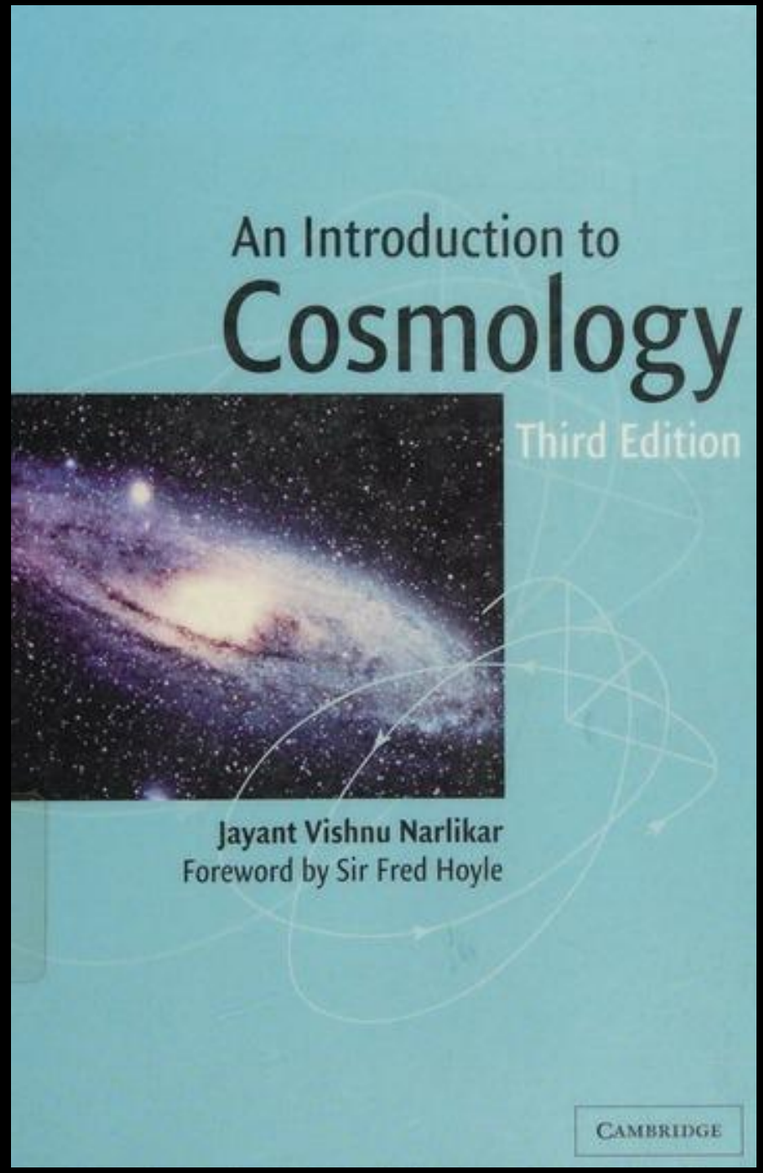
Focused on refining the mathematical models behind the steady-state theory.

Intellectual Diversity

His ideas offered **intellectual diversity** in physics, encouraging critical thinking about mainstream cosmological models.

Science Communication

Made significant efforts to communicate science through books and public discourse.



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