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Project Him Sarovar: Ladakh's Snow-Harvesting Bid for Water Security in a Warming Cold Desert

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WHY IN NEWS:

On April 14, 2026, Lieutenant Governor of Ladakh Vinai Kumar Saxena launched **Project Him Sarovar** — a snow-harvesting and water security initiative that creates 50 dedicated water bodies (each 40×30 metres × 2 metres deep) across Leh and Kargil districts, with execution support from the Indian Army, ITBP, and BRO. The project is now in active execution and was profiled across multiple national media outlets through April 17.

THE WATER CRISIS IN A COLD DESERT

Ladakh is geographically classified as a **cold desert** — receiving less than 100 mm of annual precipitation, with most water originating from glacial and snow melt. The Union Territory's water budget has historically depended on three sources:

1. **Glacial melt** — from Karakoram, Ladakh, and Zanskar ranges.
2. **Snowmelt** — seasonal run-off from winter snowfall.
3. **Limited rainfall** — primarily during the brief summer monsoon influence.

Climate change has disrupted all three:

- **Accelerated glacial retreat** — Himalayan glaciers retreating 10–60 metres per year on average; some Ladakh glaciers losing area at twice the global average rate.
- **Erratic snowfall patterns** — winter snowfall reducing in some sectors, intensifying in others.
- **Earlier melt seasons** — meltwater arriving before agricultural and pastoral demand peaks.

Compounding the supply-side stress are demand-side pressures:

- **Tourism boom** — Ladakh tourist arrivals crossed 5 lakh annually (2024), straining urban water supplies in Leh.
- **Armed forces presence** — significant water demand from military and paramilitary cantonments.
- **Population growth** — urbanisation in Leh town and Kargil.

WHAT PROJECT HIM SAROVAR DOES

Project Him Sarovar combines **engineered water bodies** with **community livelihood components** in an integrated rural development model.

Engineered Water Bodies

- **Number:** 50 water bodies in the first phase
- **Dimensions:** 40 metres × 30 metres × 2 metres deep (~2,400 cubic metres each)
- **Locations:**
  - **Leh district:** Nimoo, Nubra Valley, Diskit
  - **Kargil district:** Suru Valley, Padum (Zanskar)
- **Design principle:** Capture snowmelt and glacial-melt that historically ran off unused; store for off-season use.

Technology Mix

- **Gravity-fed systems** in higher-elevation sites where natural slope allows.
- **Solar lift mechanisms** in lower sites — using high-altitude solar irradiation to pump water without diesel infrastructure.
- **Percolation tanks** to recharge groundwater and shallow aquifers.

Livelihood Components

Project Him Sarovar is not just a water project — it bundles in agricultural and economic uses:

- **High-altitude crops:** apricot, seabuckthorn, apples — all of which command premium prices in Indian and international markets.
- **Plantation drives** to stabilise soil and reduce dust storms.
- **Winter sports infrastructure** — frozen water bodies can serve as training surfaces for ice hockey and ice skating, supporting Ladakh's emerging winter tourism economy.

Implementation Partners

- **Indian Army** and **ITBP** — providing logistics and labour in remote locations.
- **Border Roads Organisation (BRO)** — road access to project sites.
- **Local panchayats and Hill Councils** — community consultation and ownership.

WHY THIS APPROACH IS INNOVATIVE

Traditional Indian water security policy has focused on dams, canals, and pumped irrigation — frameworks designed for plain riverine geographies. Project Him Sarovar represents a **decentralised, ecosystem-appropriate alternative**:

- **No major dam infrastructure** — small water bodies avoid the ecological and seismic risks of large reservoirs in the fragile Himalayan terrain.
- **Captures otherwise wasted water** — instead of constructing new water transfers, it stores existing meltwater more effectively.
- **Ecosystem-aligned** — works with natural snow and glacial cycles rather than against them.
- **Climate-adaptive** — as glacial retreat accelerates, distributed storage becomes more critical than centralised systems.

CONNECTION TO BROADER SCHEMES

Project Him Sarovar complements several existing programmes:

PROGRAMME	CONNECTION
Jal Jeevan Mission	Drinking water access at household level — Him Sarovar provides upstream raw water
PMKSY (Pradhan Mantri Krishi Sinchayee Yojana)	Per Drop More Crop — micro-irrigation for high-altitude crops
MGNREGS	Labour mobilisation for water body excavation in eligible areas
National Mission on Sustaining the Himalayan Ecosystem (NMSHE)	Climate adaptation framework for the Indian Himalayan Region
MISHTI (Mangrove Initiative — coastal counterpart)	Conceptually parallel — both target ecosystem-specific water security

THE GLACIAL RETREAT CONTEXT

The 2019 IPCC Special Report on Oceans and Cryosphere flagged that **Hindu Kush Himalayan glaciers** are losing mass at unprecedented rates. The 2023 ICIMOD assessment projected that even under a 1.5°C warming scenario, **one-third of the region's glaciers will disappear by 2100**; under higher warming pathways, the loss exceeds two-thirds.

For Ladakh specifically:

- The **Drang-Drung glacier** in Zanskar has retreated visibly over the last two decades.
- The **Pensilungpa glacier** monitoring station data shows accelerated melt rates.
- The famous **ice stupas** of Sonam Wangchuk represent a parallel community-led innovation for glacial water storage.

Project Him Sarovar institutionalises and scales what community innovators like Wangchuk pioneered — the principle that **storing winter snow as ice for spring-summer use** is the most viable adaptation for cold desert water security.

WAY FORWARD

For Project Him Sarovar to deliver durable impact:

1. **Phase 2 expansion** — beyond the initial 50 water bodies, scaling to 200+ across Ladakh's habitations.
2. **Integration with springshed management** — many Ladakh villages depend on small springs; Him Sarovar can recharge upstream catchments.
3. **Real-time monitoring** — IoT sensors for water levels, leakage detection, and seasonal demand forecasting.
4. **Community ownership models** — handing over operation and maintenance to village water user associations after construction.
5. **Cross-Himalayan replication** — the model is applicable to Spiti (HP), Kinnaur (HP), Tawang (AP), and parts of Sikkim.

UPSC RELEVANCE

PAPER	ANGLE
GS-3 — Environment & Ecology	Cold desert ecosystem, glacial retreat, climate adaptation, decentralised water management
GS-1 — Geography	Cold desert geography, Ladakh, Karakoram and Zanskar ranges, Indian Himalayan Region
GS-3 — Economy	High-altitude agriculture, apricot/seabuckthorn value chains, tourism economy
GS-2 — Governance	UT-level scheme design, Centre-UT relations, Hill Councils, Sixth Schedule discussions
Mains Keywords	Project Him Sarovar, Ladakh, snow harvesting, glacial retreat, ice stupa, NMSHE, JJM, PMKSY, cold desert, climate adaptation, Sonam Wangchuk

FACTS CORNER

ITEM	DETAIL
Launch date	April 14, 2026
Launching authority	LG Vinai Kumar Saxena, Ladakh
Phase 1 water bodies	50 (40m × 30m × 2m each)
Districts covered	Leh (Nimoo, Nubra, Diskit) + Kargil (Suru, Padum)
Implementation partners	Indian Army, ITBP, BRO, local Hill Councils
Livelihood crops	Apricot, seabuckthorn, apples
Ladakh annual rainfall	<100 mm (cold desert)
Tourist arrivals (2024)	5+ lakh annually
Related innovation	Sonam Wangchuk's "ice stupa" (community-led precursor)

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