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MAGAZINE NOTES

Waste Management Innovations in Himalayan States

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ENVIRONMENT

ECONOMY

GS2

GS3

CURATED & WRITTEN BY

**Bharat Choudhary**

UPSC Educator & Content Creator

[in linkedin.com/in/epicbharat](https://www.linkedin.com/in/epicbharat)

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Waste Management Innovations in Himalayan States

 **Kurukshetra** Chapter 4 · 3 min read ·

Centralised waste management models are unviable in fragile Himalayan ecosystems characterised by high-altitude settlements, limited landfill space, difficult terrain, seasonal tourism pressures, and plastic pollution threatening rivers and glaciers.

Policy Framework

Swachh Bharat Mission–Urban 2.0 focus areas applicable to Himalayan states:

- Source segregation at household level
- Scientific processing and resource recovery
- Legacy waste remediation
- Citizen participation and behavioural change

Case Study 1: Kedarnath (Uttarakhand) — Digital Deposit Refund System (DRS)

PARAMETER	DETAIL
Launch	May 2022
Mechanism	Plastic bottles tagged with QR-coded USI ; ₹10 refundable deposit via UPI
Refund method	Digital via UPI through collection centres and Reverse Vending Machines
Expansion	All Char Dham pilgrimage sites
Bottles recycled	20+ lakh
CO ₂ emissions avoided	66 MT
Green jobs created	110+
Innovation	First-of-its-kind digital deposit-refund system in India; combines digital governance, behavioural nudges, and circular economy principles

Case Study 2: Jammu & Kashmir — Green Campus Framework

PARAMETER	DETAIL
Lead agency	Housing & Urban Development Department, J&K
Process	Three-stage: Identification → Preparation → Declaration
Practices	Source segregation, on-site composting, single-use plastic reduction, behaviour change campaigns
Milestone	Anantnag became first ULB to declare all campuses as Green

Case Study 3: Dharamshala (Himachal Pradesh) — Collaborative Urban Waste Model

PARAMETER	DETAIL
Launch	2021
Key initiatives	Clean Business Programme, Model Ward Programme, Decentralised MRFs, “ Waste Under Arrest ” campaign
Segregation improvement	25% rise
Road littering reduction	30%
Landfill waste reduction	40%
Integration	Urban governance + social rehabilitation + circular economy

Case Study 4: Leh (Ladakh) — Solar-Powered Circular Waste Management

PARAMETER	DETAIL
Launch	2020
Operator	Ladakh Autonomous Hill Development Council (LAHDC)
Capacity	30 tonnes/day
Power source	Solar energy (renewable — suited for high-altitude, off-grid context)
Targets	100% source segregation; 90% material recovery
Outputs	Compost, pavement tiles, revenue generation
Distinctiveness	High-altitude adaptation; renewable energy integration; zero-waste circular model

Governance Lessons for UPSC

- ❶ **Decentralisation** is essential for fragile mountain ecosystems — one-size-fits-all models fail
- ❷ **Technology + behaviour change** = sustainable outcomes (Kedarnath DRS model)
- ❸ **Community participation** (especially women-led SHGs) strengthens delivery
- ❹ **Renewable energy integration** enhances resilience in off-grid areas
- ❺ **Circular economy** reduces landfill dependence and generates local employment

UPSC Angle

- **GS3:** Environment, waste management, circular economy, sustainable development
- **GS2:** Local governance, Swachh Bharat Mission-Urban 2.0, cooperative federalism
- **Essay:** “Sustainable waste management in fragile ecosystems is as much a governance challenge as an environmental one”

KEY TERMS FOR QUICK REVISION

TERM	FULL FORM / MEANING
SISFS	Startup India Seed Fund Scheme (₹945 crore, 2021)
FFS	Fund of Funds for Startups (₹10,000 crore via SIDBI)
ATL	Atal Tinkering Labs (10,000 in schools)
AIC	Atal Incubation Centres (72 centres)
CGSS	Credit Guarantee Scheme for Startups
MSH	MeitY Startup Hub (5,310+ startups)
UAN	Universal Account Number (Aadhaar-linked portability)
OSH&WC	Occupational Safety, Health & Working Conditions Code, 2020
DRS	Deposit Refund System (Kedarnath model)
LAHDC	Ladakh Autonomous Hill Development Council
NEP 2020	National Education Policy 2020

UPSC MAINS PRACTICE QUESTIONS

- 1 **GS3 (250 words):** “Examine how technology-enabled, community-driven waste management models can address plastic pollution in fragile mountain ecosystems. Illustrate with examples from Himalayan states.”
- 2 **GS2 (250 words):** “Critically analyse the effectiveness of India’s startup support ecosystem — from seed funding to credit guarantees. Has it reduced barriers to entrepreneurship for women and Tier-II/III city entrepreneurs?”
- 3 **GS3 (250 words):** “India’s four new Labour Codes consolidate 29 laws but face implementation challenges. Evaluate the reforms from the perspective of gig workers, women workers, and MSMEs.”
- 4 **Essay (1000-1200 words):** “Sustainable waste management in fragile ecosystems is as much a governance challenge as an environmental one.”

Source: [NextIAS Kurukshetra January 2026 Summary](#)



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[in linkedin.com/in/epicbharat](https://www.linkedin.com/in/epicbharat)[Read Full Article on Ujiyari →](#)<https://ujiyari.com/magazines/2026/kurukshetra-january-2026/waste-management-himalayan/>

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