



Plastic Waste Crisis in the Himalayan Region

For Prelims: [Himalayan region](#), [Extended Producer Responsibility](#), [Multi Layered plastics](#), [Microplastics](#), [Indus](#), [Ganga](#), [Greater Adjutant stork](#), [Landfills](#)

For Mains: [Solid Waste Management Rules, 2016](#), [Plastic Waste Management Rules, 2016](#), Plastic Waste Crisis in the Himalayan Region: Challenges, Consequences, and Sustainable Solutions

Source: [DTE](#)

Why in News?

The [Himalayan region](#), known for its pristine environment, is facing a growing [plastic waste](#) crisis. Since 2018, “**The Himalayan Cleanup (THC)**” movement has brought volunteers together annually to clean up waste and audit the collected trash to understand its sources.

- A crucial part of addressing this issue is **implementing [Extended Producer Responsibility \(EPR\)](#)**, which holds manufacturers accountable for their products' lifecycle, encouraging them to minimise waste and adopt sustainable practices to support local cleanup efforts.

Note: **The Himalayan Cleanup (THC) is the biggest campaign** addressing plastic pollution in the mountains. Each year, **THC identifies the top polluting companies and demands accountability**. The campaign encourages individuals, organisations, waste managers, and policymakers to take action against the plastic crisis.

What is the Extent of the Plastic Waste Crisis in the Himalayan Region?

- **Waste Generation:** [Solid waste generation \(SWG\)](#) in the Himalayas varies based on factors such as [urbanisation](#), [tourism](#), and [household income levels](#).
 - A large portion of the **waste is [biodegradable](#)**, coming from households, markets, and hotels. However, **plastic waste is predominant in tourist areas**.
 - Tourist hotspots generate a significant amount of **plastic waste**. **Waste management in the Himalayan region** is severely inadequate, despite the importance of these ecosystems.
- **Plastic Waste:** Plastic pollution has reached even the **remotest parts of the mountains**, with no systems in place to bring the waste back down for recycling or disposal.
 - Only about 25% of collected plastic waste consists of Polyethylene Terephthalate (PET), High-Density Polyethylene (HDPE), and Low-density polyethylene (LDPE), which are **categorised as recyclable**, while the **majority (75%) is non-recyclable**. [Multi-layered plastics \(MLP\)](#) pose an added challenge as they are non-recyclable and difficult to manage.
 - [Microplastics](#), formed by the degradation of larger plastic items, have been found

in **Himalayan glaciers, rivers, lakes, and even in human tissues.**

- The main contributors to plastic waste are plastics generated from **top food brands, smoking and tobacco brands, and personal care products.**

Note: India is one of the **world's largest contributors to plastic pollution**, generating around **9.3 million tonnes of plastic waste annually**. This accounts for nearly **20% of the global total**.

































- The rapid urbanisation, population growth, and economic development have led to increased use of single-use plastics and packaging materials.
- A report by **Swiss non-profit EA Earth Action** reveals that **India, along with 11 other countries, is responsible for 60% of the world's mismanaged plastic waste.**
 - India ranks 4th in the **Mismanaged Waste Index (MWI) 2023**, with 98.55% of generated waste being **mismanaged and fares poorly in the management of plastics waste**, according to the EA report.
 - MWI is the ratio of the mismanaged waste and the total waste.

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THE 7 TYPES OF PLASTICS

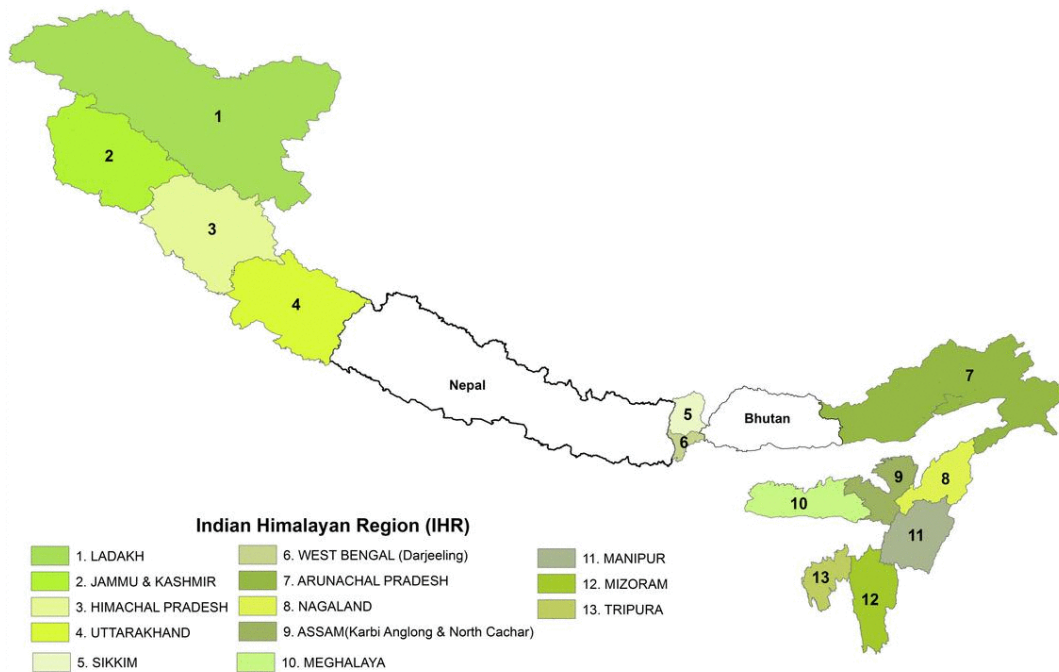
THEIR TOXICITY AND WHAT THEY ARE MOST COMMONLY USED FOR

TOXICITY CODE:  LOW  HIGH

Polymer Name	POLYETHYLENE TEREPHTHALATE	HIGH-DENSITY POLYETHYLENE	POLYVINYL CHLORIDE	LOW-DENSITY POLYETHYLENE	POLYPROPYLENE	POLYSTYRENE	All other plastics, including acrylic, fiberglass, nylon, polycarbonate, and polyactic acid (a bioplastic)
Resin Identification Code							
Abbreviation	PET or PETE	HDPE	PVC	LDPE	PP	PS	OTHER
Recyclable?	Commonly Recycled	Commonly Recycled	Sometimes Recycled	Sometimes Recycled	Occasionally Recycled	Commonly Recycled (but difficult to do)	Difficult to Recycle
Percentage Recycled Annually			<1% gauge" data-bbox="365 515 412 545"/>				
How Long to Decompose Under Perfect Conditions	5-10 Years	100 Years	Never	500-1,000 Years	20-30 Years	50 Years	Majority of these plastics: never Polylactic acid: 6 months
Maximum Temperature	 70°C (158°F)	 120°C (248°F)	 70°C (158°F)	 80°C (176°F)	 135°C (275°F)	 90°C (194°F)	Polycarbonate: 135°C (275°F) Polylactic acid: 150°C (302°F)
Brittleness Temperature	 -40°C (-40°F)	 -100°C (-148°F)	 -30°C (-22°F)	 -100°C (-148 °F)	 0°C (32°F)	 -20°C (-4°F)	Polycarbonate: -135°C (-211°F) Polylactic acid: 60°C (140°F)
Toxicity Level							
Most Commonly Leached Toxin(s)	Antimony Oxide, Bromine, Diazomethane, Lead Oxide, Nickel Ethylene Oxide, and Benzene	Chromium Oxide, Benzoyl Peroxide, Hexane, and Cyclohexane	Benzene, Carbon Tetrachloride, 1,2-Dichloroethane, Phthalates, Ethylene Oxide, Lead Chromate, Methyl Acrylate, Methanol, Phthalic Anhydride, Tetrahydrofuran, and Tribasic Lead Sulfate, Mercury, Cadmium, Bisphenol A (BPA)	Benzene, Chromium Oxide, Cumene Hydroperoxide, And Tert-butyl Hydroperoxide	Methanol, 2,6-di-tert-Butyl-4-Methyl Phenol, and Nickel Dibutyl Dithiocarbamate	Styrene, Ethylbenzene, Benzene, Ethylene, Carbon Tetrachloride, Polyvinyl Alcohol, Antimony Oxide, and Tert-butyl Hydroperoxide, Benzoquinone	BPA, BPS, as well as all other toxins mentioned

Indian Himalayan region

- It refers to the mountainous area in India that encompasses the entire **Himalayan range within the country**. It stretches from the northwestern part of India in Jammu and Kashmir to the northeastern states along the border with countries like Bhutan, Nepal, and Tibet (China).
- The Indian Himalayan Region is spread across **13 Indian States/Union Territories** (namely **Jammu and Kashmir, Ladakh, Uttarakhand, Himachal Pradesh, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Assam and West Bengal**), stretching across 2500 km.



What are the Consequences of Poor Plastic Waste Management?

- **Environmental Degradation:** Open dumping of waste not only tarnishes the scenic beauty of the mountains but also leads to **air and soil pollution**, and **destabilises mountain slopes**.
- **Impact on Water Sources:** The Himalayan region is vital for the water supply of major Indian rivers like the **Indus, Ganga**, and **Brahmaputra**. Unscientific disposal of plastic waste is **polluting these water sources** and harming biodiversity.
- **Biodiversity at Risk:** Wildlife, such as the **Greater Adjutant stork in Assam**, is reportedly consuming plastic waste instead of their natural diet.
- **Public Health Threats:** Pollution from mixed waste in **landfills** poses health risks to local communities and disrupts ecosystems.

What are the Challenges of Waste Management in the Himalayas?

- **Harsh Terrain and Climate:** The remote and rugged landscape, combined with **harsh climatic conditions**, makes waste collection and disposal more challenging than in urban areas.
 - **Segregation at source, collection, and waste transport** remain major challenges in Himalayan states.
 - Most waste is collected and dumped in landfills or rolled downhill, exacerbating the pollution problem.
- **Limited Infrastructure:** The availability of **land for waste treatment and disposal** is limited, and infrastructure for handling solid waste is often weak or non-existent.
 - The practice of **centralised dumping is still widespread**, and the infrastructure for recycling is lacking.
- **Regulations and Data Gaps:** There is **insufficient data on the volume and types of waste generated** in the Himalayan settlements, making it harder to manage waste effectively.
 - Despite existing regulations under the **Solid Waste Management Rules, 2016** and **Plastic Waste Management Rules 2016**, the pace of implementation has been slow.
- **Lack of Awareness:** Local communities are aware of the link between waste management and environmental health but **lack knowledge about proper disposal practices**.

What are the Concerns Regarding the EPR in the Himalayan Region?

- **Limited Implementation:** The EPR framework, anticipated to address plastic pollution, has seen **minimal implementation in the Himalayan states**. Local bodies **exhibit low awareness of EPR**, hampering effective operationalization.
- **Non-Recognition of Local Context:** Current EPR rules do not adequately account for the specific needs and conditions of mountain communities, ignoring factors such as **population density, local economies, and environmental fragility**.
 - The **one-size-fits-all approach fails to recognize the ecological significance and challenges faced in the Himalayas**.
- **Geographical Challenges:** The mountainous terrain presents unique challenges in waste collection, aggregation, and transportation, making traditional EPR models difficult to apply.
 - Inaccessible regions exacerbate issues of waste management, leading to an accumulation of litter.
- **Insufficient Producer Responsibility:** The burden of waste management has **largely fallen on consumers and waste managers**, with **producers not being held adequately accountable** for the lifecycle of their products.
 - There is a persistent lack of mechanisms for producers to take responsibility for waste generated from their products, particularly in remote areas.

Legal Mandate for Waste Management in the Himalayan Region

- **National Regulatory Framework:** The **Solid Waste Management (SWM) Rules 2016**, **Plastic Waste Management (PWM) Rules 2016**, and [Extended Producer Responsibility \(EPR\) 2022](#) form India's framework for plastic waste management.
- **Acknowledgment of Hill Areas:** The SWM recognizes the special needs of hill areas, but this is not adequately reflected in the mandates for local bodies and Producers, Importers, and Brand Owners (PIBOs).
- **State Specific Initiatives and Regulatory Efforts:**
 - **Himachal Pradesh:** Enacted state laws banning certain plastics and introduced a buyback policy for **non-recyclable and single-use plastics** in 2019, though littering remains an issue.
 - **Sikkim:** Banned **packaged mineral water** in January 2022 and developed a robust regulatory system, yet struggles with inadequate infrastructure for plastic waste management.
 - **Tripura:** Enacted municipal by-laws and formed a state-level task force to combat single-use plastics, but results are limited.

Way Forward

- **Local Adaptation of EPR Rules:** Modify the **Extended Producer Responsibility Rules (2022)** to suit the unique challenges of waste management in mountainous regions.
 - Engage local bodies in the development and enforcement of EPR regulations to ensure they are practical and effective. Provide **incentives for manufacturers to adopt sustainable practices** and take responsibility for their packaging and waste.
- **Implement Zoning Regulations:** Similar to the [National Green Tribunal's \(NGT\)](#) classification of [Nainital into prohibited, regulated, and development zones](#), the Himalayan region should establish designated areas that dictate the extent of **permissible activities to mitigate environmental impact** and promote responsible development.
- **Empowering Mountain Communities:** To tackle the waste crisis in the Himalayas, **encouraging local agriculture** is vital for reducing reliance on packaged goods that generate plastic waste. **Community-supported agriculture (CSA)** can foster partnerships between consumers and local farmers, enhancing access to fresh produce.
 - Furthermore, **educational initiatives will inform communities about the benefits of local foods** over processed options, supporting effective waste management and overall well-being.
- **Phased Implementation:** A systematic, **multi-tiered approach is needed**, with the government and partners managing institutional capacity, policymaking, enforcement,

and **technological advancements** in solid waste management.

- **Improved Data Collection:** More data on **waste generation and management in mountain areas** is essential to address bottlenecks and design effective solutions.
- **International Best Practices:** Case studies such as **South Korea's transformation of the Nanjido Island dump into an eco-park** can inspire strategies for eco-restoration and improved SWM practices in the Himalayas.

Drishti Mains Question:

Discuss the impact of plastic waste management practices on biodiversity and public health in the Himalayan region. How does this reflect the broader challenges faced by fragile ecosystems?

UPSC Civil Services Examination, Previous Year Questions (PYQ)

Prelims

Q1. Why is there a great concern about the 'microbeads' that are released into environment? (2019)

- (a) They are considered harmful to marine ecosystems.
- (b) They are considered to cause skin cancer in children.
- (c) They are small enough to be absorbed by crop plants in irrigated fields.
- (d) They are often found to be used as food adulterants.

Ans: (a)

Q2. In India, 'extend producer responsibility' was introduced as an important feature in which of the following? (2019)

- (a) The Bio-medical Waste (Management and Handling) Rules, 1998
- (b) The Recycled Plastic (Manufacturing and Usage) Rules, 1999
- (c) The E-Waste (Management and Handling) Rules, 2011
- (d) The Food Safety and Standard Regulations, 2011

Ans: (c)