



**COMPREHENSIVE DEVELOPMENT FRAMEWORK
REPORT OF UTTARAKHAND**

YOUTH PEACE AND DEVELOPMENT FORUM

NEW DELHI

JULY 2026

© 2026 Youth Peace and Development (YPD) Forum. All Rights Reserved.

This publication has been independently prepared and published by the **Youth Peace and Development (YPD) Forum**, a non-profit, non-partisan, youth-led public policy and research organization. The contents of this publication reflect independent research, analysis, and policy recommendations developed by members and contributors of the YPD Forum.

This publication **does not represent, and should not be construed as representing, the official views, policies, positions, or opinions of the Government of India, any State Government, government ministry or department, public institution, international organization, diplomatic mission, or any other governmental or intergovernmental body**, unless expressly stated otherwise.

The preparation, publication, and dissemination of this document have **not been funded, sponsored, commissioned, or formally endorsed by any government, political party, corporation, foreign government or entity, international organization, or external funding organization**, unless expressly disclosed in this publication. The document is the outcome of voluntary research and policy work undertaken by young researchers and students committed to advancing peace, development, public policy, and international cooperation. The views and recommendations expressed in this publication are those of the respective authors or contributors and do not necessarily reflect the views of every member, office-bearer, associate, or institutional partner of the YPD Forum.

No part of this publication may be reproduced, republished, distributed, transmitted, adapted, or stored in any form or by any means, whether electronic or mechanical, without appropriate acknowledgment of the **Youth Peace and Development (YPD) Forum**, except where such use is permitted under applicable copyright law, including fair dealing, fair use, educational use, or other applicable statutory exceptions, provided that proper attribution and citation are given.

FOREWORD

Uttarakhand has emerged as one of India's most dynamic and rapidly developing states. Since its formation, the state has established itself as a national leader in information technology, life sciences, pharmaceuticals, innovation, digital governance, and industrial development. With Dehradun serving as a globally recognized technology and research hub, Uttarakhand has demonstrated how visionary governance, strategic investments, and innovation-driven policies can accelerate economic growth while creating opportunities for millions. As India advances towards becoming a developed nation by 2047, Uttarakhand is uniquely positioned to play a transformative role in shaping the country's knowledge economy and technological future.

However, as we navigate the rapidly changing economic, technological, and environmental realities of the twenty-first century, it has become increasingly evident that Uttarakhand stands at an important stage in its development journey. While the state has achieved remarkable progress across multiple sectors, it also faces complex challenges that require long-term strategic planning. Balanced regional development, employment generation for a growing youth population, sustainable urbanization, water resource management, climate resilience, agricultural modernization, environmental conservation, and expanding innovation beyond metropolitan centres have become critical priorities for the coming decades.

To fully realize its immense potential, Uttarakhand must continue its transition towards a globally competitive, innovation-driven, environmentally sustainable, and inclusive economy. It is within this important context that The Comprehensive Development Framework Report of the State of Uttarakhand was conceived. When the Youth Peace and Development Forum, through its Council for Comprehensive Development Frameworks, entrusted me with the responsibility of leading this ambitious initiative, our objective was clear—to prepare a forward-looking, evidence-based, and actionable roadmap capable of guiding the state's long-term development.

Leading this extensive project has been both a privilege and an intellectually enriching experience. Over several months, our research team carefully examined the structural opportunities and emerging challenges that will shape Uttarakhand's future. From the outset, we recognized that sustaining high economic growth requires more than incremental policy improvements. It demands integrated planning, institutional innovation, data-driven governance, and coordinated reforms across every major sector of public administration and economic activity.

This document represents the culmination of rigorous research, comparative policy analysis, and extensive deliberations among researchers, young professionals, subject experts, and policy enthusiasts. Rather than serving merely as an assessment of existing systems, this framework has been designed as a practical blueprint for transformative action. The strategic recommendations presented throughout this report seek to strengthen Uttarakhand's long-term competitiveness while ensuring inclusive and sustainable development.

Our recommendations place particular emphasis on strengthening higher education, research, and advanced skill development to build a globally competitive workforce; expanding innovation ecosystems in artificial intelligence, biotechnology, pharmaceuticals, semiconductors, aerospace, and information technology; accelerating industrial growth through advanced manufacturing; modernizing agriculture with precision farming and sustainable irrigation practices; improving healthcare systems; strengthening digital governance; expanding renewable energy; enhancing urban infrastructure; and developing climate-resilient cities and rural communities. Throughout this framework, we have remained committed to one guiding principle: economic progress must be accompanied by environmental sustainability, social inclusion, and equal opportunities for every citizen.

As the lead of this important initiative, I take immense pride in the dedication, professionalism, and commitment demonstrated by every member of our research and drafting team. We firmly believe that the youth of India should actively contribute to shaping public policy rather than merely observing it. The contributors to this report devoted countless hours to analysing developmental trends, studying international best practices, consulting policy literature, and evaluating innovative solutions to ensure that every recommendation presented here is both ambitious and practically achievable.

This report reflects our generation's vision for a future-ready Uttarakhand. We envision a state that combines world-class technological innovation with inclusive growth, rapid industrial expansion with environmental stewardship, global competitiveness with social equity, and economic excellence with a high quality of life. We aspire to build an Uttarakhand where innovation flourishes, entrepreneurship thrives, talented young people find meaningful opportunities, and every region of the state shares in the benefits of sustained development.

It is my sincere hope that this Comprehensive Development Framework will serve as a catalyst for informed discussion, constructive collaboration, and long-term strategic planning. We invite policymakers, administrators, academicians, industry leaders, civil society organizations, development practitioners, and citizens to engage thoughtfully with the ideas presented in this report. I invite you to read this report with an open mind, critically examine its recommendations, and join us in the collective endeavour to build a prosperous, innovative, sustainable, and globally competitive Uttarakhand for generations to come.

Dheeraj G. N.
Chairman
Youth Peace and Development (YPD) Forum
New Delhi

ACKNOWLEDGEMENT

The Youth Peace and Development Forum (YPD Forum) expresses its sincere gratitude to all individuals whose dedication, expertise, and commitment made the preparation of The Comprehensive Development Framework Report of the State of Uttarakhand possible.

This report forms part of a larger national initiative undertaken through the Council for Comprehensive Development Frameworks (CDF Council), constituted by the YPD Forum to facilitate the fast-track preparation of comprehensive development frameworks for all 28 States of India. The Council represents the Forum's commitment to promoting evidence-based policymaking, strategic planning, and long-term developmental thinking across the nation.

The Forum places on record its deep appreciation to Dheeraj G. N., Chairman of the Youth Peace and Development Forum, for his vision, leadership, and initiative in conceptualizing and guiding this ambitious project. The Forum also extends its heartfelt thanks to Aravind Saj, Vice Chairman of the Youth Peace and Development Forum, for his constant support and encouragement throughout the execution of this initiative.

Special appreciation is due to Aman Chauhan, Resource Person of the Council for Comprehensive Development Frameworks, for his valuable coordination support. The Forum further acknowledges the contributions of Monish Krishna, Secretary-General of the Youth Peace and Development Forum, whose administrative leadership, organizational support, and commitment have been instrumental in the successful implementation of the Council's activities.

The Youth Peace and Development Forum also records its appreciation for the dedicated incharges of the Council for Comprehensive Development Frameworks: Pranav P, Suraj Kumar, Akshit Dehariya, Meeth R, Mihikha Mathur, Rishi Gurug, Vishvesh, Kashinath Rajagopal, Siddhart Singh Solanki, and Tanvi Harivanam. Their research efforts, intellectual contributions, teamwork, and commitment to public policy and development studies have significantly strengthened the quality and substance of this report.

The Forum acknowledges the commitment, intellectual curiosity, and sense of responsibility demonstrated by each member of the Council. Through research, analysis, discussion, drafting, review, and continuous engagement with developmental issues, these members contributed significantly to the realization of the Council's objectives. Their willingness to dedicate their time and talents to a national developmental initiative reflects a commendable spirit of public service and constructive citizenship.

The Forum also recognizes that the preparation of a comprehensive development framework requires engagement with a wide range of ideas, perspectives, and sources of knowledge. Accordingly, sincere appreciation is extended to all researchers, academicians, policy experts, development practitioners, government publications, statistical agencies, think tanks, and public institutions whose work provided valuable insights and reference material for this

report. Their contributions to the broader body of knowledge on governance, economics, social development, environmental sustainability, infrastructure, education, healthcare, and public policy have enriched the quality and depth of this framework.

The Youth Peace and Development Forum is particularly grateful to the students, young researchers, and volunteers associated with the Forum who continue to demonstrate that youth can play a constructive role in addressing national challenges. Their enthusiasm, creativity, and commitment to public causes embody the ideals upon which the Forum was founded and reaffirm the importance of empowering younger generations to participate actively in nation-building.

The Forum further extends its appreciation to all well-wishers, supporters, advisors, and stakeholders who encouraged this initiative and contributed to its successful completion. Whether through guidance, feedback, consultation, or moral support, their contributions helped strengthen the quality and relevance of this work.

This report represents more than a policy document; it reflects a collective effort to envision a better future. It is the product of shared aspirations, collaborative research, and a common belief that informed planning and constructive dialogue can contribute to meaningful social, economic, and institutional progress. While the recommendations contained herein are intended to support the development of Uttarakhand, they also form part of a broader national effort to strengthen the foundations of a developed, inclusive, sustainable, and prosperous India.

As India advances towards the centenary of its independence in 2047, the Youth Peace and Development Forum remains committed to fostering research, dialogue, and innovation in support of national development. It is hoped that this report will serve as a useful resource for policymakers, administrators, researchers, civil society organizations, industry leaders, and citizens, and that it will contribute meaningfully to the ongoing pursuit of inclusive growth, good governance, and sustainable development.

With gratitude to all who contributed to this endeavour, the Youth Peace and Development Forum proudly presents this report as a modest contribution towards the shared vision of a stronger Uttarakhand and a developed India.

Media and Publication Division

Youth Peace and Development Forum

TABLE OF CONTENT

Preface	pg no. 13
Executive Summary	pg no. 15
Chapter 1 : State profile - Geography, Demography and Society.....	pg no. 16
1.1 Geographic and Ecological Characteristics of the state	
1.2 Administrative Divisions: Districts, Divisions and Sub-State Units	
1.3 Demographic Structure: Population, Density, Growth and Composition	
1.4 Linguistic, Ethnic, Religious and Cultural Profile	
1.5 Human Development Index: State Ranking and Trend Analysis	
1.6 Poverty, Inequality and Multidimensional Deprivation Indices	
1.7 Intra-state disparities: Aspirational districts and Backward region identification	
1.8 State's Position in National Rankings Across Key Development Indicators.	
Chapter 2 : Fiscal architecture of the state.....	pg no. 21
2.1 Revenue Framework: Own Tax Revenue, Non-Tax Revenue and Devolution	
2.2 Expenditure Profile: Composition, Quality and Efficiency	
2.3 Capital Expenditure: Infrastructure Investment and Asset Creation	
2.4 Fiscal Deficit, Primary Deficit and Debt Sustainability	
2.5 State's Borrowings, Guarantees and Off-Budget Liabilities	
2.6 Finance Commission Awards: Allocation and Utilisation	
2.7 GST Implementation: Revenue Impact and Compensation Status	
2.8 Public Financial Management Reforms and Audit Compliance	
2.9 Centre-State fiscal relations: Trends and themes	
Chapter 3: Economic Structure, Growth and Sectoral Performance.....	pg no. 28
3.1 Gross State Domestic Product: Trends, Growth Rate and Sectoral Share	
3.2 Per Capita Income and Purchasing Power Analysis	
3.3 Primary Sector: Agriculture, Horticulture, Animal Husbandry and Fisheries	
3.4 Secondary Sector: Industry, Manufacturing and Mining	
3.5 Tertiary Sector: Trade, Finance, Real Estate and Services	
3.6 Informal Economy: Size, Significance and Integration Challenges	
3.7 Labour Market: Employment, Unemployment and Workforce Quality	
3.8 Inflation, Price Stability and Consumer Welfare	
3.9 Growth Corridors: engines of economic expansion	

Chapter 4: Investment, Industry and Private Sector Development.....pg no. 34

- 4.1 Investment Climate Assessment and Ease of Doing Business
- 4.2 Industrial Policy Framework and MSME Development
- 4.3 Large and Anchor Industries: Sectoral Analysis
- 4.4 Special Economic Zones, Industrial Corridors and Clusters
- 4.5 Foreign Direct Investment: Inflows, Sectoral Distribution and Policy
- 4.6 Public Sector Undertakings: Performance and Reform Agenda
- 4.7 Public-Private Partnership Framework and Pipeline
- 4.8 Regional cooperation: Shared region and growth

Chapter 5: Education — Access, Quality and Future Readiness.....pg no. 39

- 5.1 Elementary Education: Enrolment, Retention, Dropout and Learning Outcomes
- 5.2 Secondary and Senior Secondary Education: Transition and Achievement
- 5.3 Higher Education: Institutional Capacity, Gross Enrolment and Quality
- 5.4 Technical, Vocational Education and Training (TVET) Ecosystem
- 5.5 Teacher Recruitment, Training and Professional Development
- 5.6 Digital Education, EdTech Integration and ICT in Schools
- 5.7 Special Education: Children with Disabilities and Inclusive Schooling
- 5.8 State-Specific Educational Challenges and Reform Priorities

Chapter 6: Health, Nutrition and Population.....pg no. 44

- 6.1 Public Health Infrastructure: Facilities, Human Resources and Gaps
- 6.2 Epidemiological Profile: Communicable and Non-Communicable Disease Burden
- 6.3 Maternal and Child Health: MMR, IMR, Under-5 Mortality and Nutrition
- 6.4 Universal Health Coverage: State Health Assurance Schemes
- 6.5 Mental Health Services: Availability, Access and Stigma Reduction
- 6.5a Migration, Family Structure and Psychosocial Health
- 6.6 Nutrition Programmes: ICDS, Mid-Day Meal and Poshan Abhiyan
- 6.7 Population Stabilisation and Family Planning
- 6.8 Health System Strengthening and Future Preparedness

Chapter 7: Social Justice, Inclusion and Community Welfare.....pg no. 48

- 7.1 Scheduled Castes: Demographic Profile, Deprivation and Development Programmes
- 7.2 Scheduled Tribes: Rights, Forest Dwelling Communities and Welfare Measures
- 7.3 Other Backward Classes: Identification, Reservation and Social Mobility
- 7.4 Gender Equity: Women's Participation in Education, Economy and Governance
- 7.5 Child Rights, Protection and Development: POCSO, Child Labour and Nutrition
- 7.6 Welfare of Elderly Persons: Pension, Care Infrastructure and Policy

- 7.7 Persons with Disabilities: Rights, Accessibility and Empowerment
- 7.8 Minority Communities: Development, Representation and Welfare
- 7.9 Social Security and Beneficiary-Linked Welfare Architecture

Chapter 8: Transport and Connectivity Infrastructure.....pg no. 53

- 8.1 Road Network: National Highways, State Highways and Rural Roads
- 8.2 Railways: Existing Network, Pending Projects and Expansion Proposals
- 8.3 Aviation: Airport Infrastructure and Air Connectivity
- 8.4 Ports, Inland Waterways and Logistics Hubs
- 8.5 Urban Mass Transit: Metro, Bus Rapid Transit and Integrated Mobility
- 8.6 Multimodal Logistics: Last-Mile Connectivity and Freight Corridors

Chapter 9: Energy, Power and Renewable Transition.....pg no. 57

- 9.1 Power Generation: Installed Capacity, Mix and Dependence Profile
- 9.2 Transmission and Distribution: Infrastructure, Losses and Reliability
- 9.3 Rural and Household Electrification: Coverage and Quality
- 9.4 Renewable Energy Potential: Solar, Wind, Hydro and Biomass
- 9.5 Energy Efficiency, Conservation and Demand-Side Management
- 9.6 State Electricity Regulatory Framework and Tariff Policy

Chapter 10: Water, Sanitation and Solid Waste Management.....pg no. 61

- 10.1 Drinking Water Supply: Coverage, Quality and Infrastructure
- 10.2 Irrigation Infrastructure: Command Area, Efficiency and Water-Use Productivity
- 10.3 Sanitation and Open Defecation Free Status: Post-ODF Sustainability
- 10.3a Comparative State Performance and Lessons
- 10.4 Solid Waste Management: Municipal, Biomedical and Hazardous Waste
- 10.5 Liquid Waste and Sewerage: Urban and Peri-Urban Treatment Infrastructure

Chapter 11: Urban Development, Housing and Smart Cities.....pg no. 65

- 11.1 Urbanisation Trends and Urban Governance Architecture
- 11.2 Urban Local Bodies: Financial Health, Capacity and Service Delivery
- 11.3 Housing: Demand Assessment, Affordability and Flagship Schemes
- 11.4 Smart Cities Mission and AMRUT: State-Level Implementation Review
- 11.5 Heritage Cities, Cultural Landscapes and Urban Tourism
- 11.6 Urban Poverty, Slum Rehabilitation and In-Situ Upgradation

Chapter 12: Rural Development and Decentralised Governance.....pg no. 68

- 12.1 Panchayati Raj Institutions: Structure, Devolution and Capacity
- 12.2 VB G-Ram-G (MGNREGA): Coverage, Wage Trends and Livelihood Outcomes
- 12.3 Rural Housing: PMAY-Gramin and State Schemes
- 12.4 Livelihood Promotion: SHGs, Cooperatives and Rural Enterprise
- 12.5 Rural Infrastructure: PMGSY, Connectivity and Market Linkages
- 12.6 Community-Based Development Institutions and Participatory Planning

Chapter 13: Environment and Natural Resource Governance.....pg no. 72

- 13.1 Forest Cover, Biodiversity and Wildlife Conservation
- 13.2 Land Use Change, Soil Degradation and Land Resource Management
- 13.3 Water Bodies, Wetlands and River Ecosystem Health
- 13.4 Mining and Mineral Resource Governance
- 13.5 Pollution: Air, Water, Noise and Soil — Status and Regulatory Response
- 13.6 Coastal and Marine Resource Management (where applicable)

Chapter 14: Climate Change and Ecological Security.....pg no. 76

- 14.1 State Climate Vulnerability and Risk Profile
- 14.2 State Action Plan on Climate Change: Review and Second Generation Reforms
- 14.3 Disaster Risk Profile: Hazard, Exposure and Vulnerability Mapping
- 14.4 Disaster Risk Reduction: Institutional Mechanisms and Preparedness
- 14.5 Post-Disaster Response, Relief and Reconstruction Framework
- 14.6 Green Economy Transition: Opportunities and Structural Challenges

Chapter 15: Administrative Governance Reform.....pg no. 80

- 15.1 Structure of State Administration and Inter-Departmental Coordination
- 15.2 Anti-Corruption Framework: Lokayukta, Vigilance and Enforcement
- 15.3 Legal and Judicial Administration: Pendency, Access and Reform
- 15.4 Police Modernisation and Internal Security Management
- 15.5 Regulatory Governance: Quality, Consistency and Independence
- 15.6 Reduction of Red-tapism: Simplification and way forward
- 15.7 Civil service strength: Vacancy rates and Training institutions

Chapter 16: Technology-Enabled Service Delivery.....pg no. 84

- 16.1 Digital Infrastructure: Broadband, Optical Fibre and Connectivity Coverage
- 16.2 e-Governance Architecture and Digital Public Infrastructure
- 16.3 Citizen Service Delivery: CSCs, Service Portals and Mobile Governance
- 16.4 Data Governance, Open Data Policy and Privacy Framework

- 16.5 Cybersecurity: State-Level Institutional Mechanisms
- 16.6 Emerging Technologies: AI, Geospatial Systems and Smart Governance

Chapter 17: Innovation, Research and Knowledge Economy.....pg no. 88

- 17.1 State Innovation Ecosystem: Startups and Accelerators
- 17.2 Research and Development: Academic-Industry Linkages
- 17.3 Intellectual Property: Awareness, Registration and Commercialisation
- 17.4 Knowledge Institutions as Engines of Development
- 17.5 Building a Youth Innovation and Research Ecosystem
- 17.6 Skill Development, Employability and Workforce Alignment

Chapter 18: Agriculture, Allied Sectors and Food Security.....pg no. 92

- 18.1 Cropping Pattern, Agricultural Productivity and Input Use
- 18.2 Irrigation and Water Use Efficiency in Agriculture
- 18.3 Agricultural Marketing, Price Realisation and Farmer Income
- 18.4 Food Processing Industry and Value Chain Development
- 18.5 Animal Husbandry, Dairy and Poultry: Economic Contribution
- 18.6 Fisheries: Inland, Marine and Aquaculture
- 18.7 Horticulture, Floriculture and Medicinal Plants
- 18.8 Agricultural Credit, Insurance and Risk Management

Chapter 19: Tourism, Culture and Creative Economy.....pg no. 96

- 19.1 Tourism Asset Inventory: Natural, Heritage, Religious and Adventure
- 19.2 Tourism Infrastructure: Hotels, Connectivity and Facilitation
- 19.3 Domestic and International Tourist Flows: Trends and Targets
- 19.4 Cultural Heritage Preservation and Institutional Framework
- 19.5 Creative Industries: Handicrafts, Performing Arts and Cultural Economy
- 19.6 Film, Media and Content Industries as Economic Drivers

Chapter 20: Cross-Cutting Themes and Integrated Policy Imperatives.....pg no. 99

- 20.1 Sustainable Development Goals of the state
- 20.2 Gender Mainstreaming Across Sectors
- 20.3 Youth Policy and Demographic Dividend Realisation
- 20.4 Migration: Internal, Inter-State and International Dimensions
- 20.5 Science, Technology and Innovation for Development
- 20.6 Statistical System Strengthening and Evidence-Based Policymaking
- 20.7 Public Participation: Behavioural Change and Citizen Engagement

Chapter 21: Vision 2047 — Strategic Priorities and Development.....pg no. 103

- 21.1 Long-Term Vision and Flagship Missions
- 21.2 Medium-Term Priority Action Plan (2025–2030)
- 21.3 Financing Strategy: Resource Mobilisation, Revenue Enhancement and Expenditure Rationalisation
- 21.4 Centre-State Partnership: Centrally Sponsored Schemes and Special Grants
- 21.5 Inter-State Cooperation: Regional Development Councils and River Boards
- 21.6 International Collaboration: Common Development Agenda and Global Partnership
- 21.7 Monitoring, Evaluation and Results Framework
- 21.8 Accountability Architecture: Legislature, Civil Society and Citizens

End Note.....pg no. 108

Reference Listpg no. 109

PREFACE

Uttarakhand occupies a distinctive and, in several respects, unusually consequential place within India's federal development story. Carved out of the Himalayan districts of Uttar Pradesh on 9 November 2000, the state, popularly known as Devbhoomi, or the Land of the Gods, combines fragile high Himalayan terrain, some of Hinduism's most significant pilgrimage sites, and a rapidly diversifying economy within a geography that covers barely two per cent of India's land area yet carries development responsibilities, and vulnerabilities, disproportionate to its size. This Comprehensive Development Framework Report of the State of Uttarakhand has been prepared in recognition of the fact that the state now stands at a genuinely distinctive juncture, one where the pace of its economic transformation is beginning to outstrip, in several sectors, the institutional and ecological safeguards needed to sustain that transformation over the long term.

Uttarakhand's recent economic performance has been considerable. The state's Gross State Domestic Product is projected to reach approximately Rs 4.29 trillion, or 50.26 billion dollars, in the 2025-26 financial year, having grown at a compound annual growth rate of 8.86 per cent between 2018-19 and 2025-26 (Uttarakhand State Presentation Report, IBEF, 2026). Chief Minister Pushkar Singh Dhami has reported that the state's economy has grown one and a half times over the preceding four years, with GSDP growth of 7.23 per cent recorded in the most recent year alone, and per capita income rising by 41 per cent over the same period (Uttarakhand Committed to Viksit Bharat Goal, ANI, 2026). This growth has been achieved alongside a deliberate, and nationally unprecedented, institutional innovation: Uttarakhand became the first state in India to launch a Gross Environmental Product index, an official metric intended to measure the state's ecological capital alongside its conventional economic output, reflecting the state government's own acknowledgment that GSDP growth pursued without regard to the Himalayan ecosystem's carrying capacity would be self-defeating for a state whose economy, water security, and disaster risk profile are all directly governed by the health of that ecosystem (Uttarakhand Committed to Viksit Bharat Goal, ANI, 2026).

This same period has also seen Uttarakhand become the first state in independent India to implement a Uniform Civil Code, with the Uniform Civil Code of Uttarakhand Act, 2024 receiving presidential assent on 11 March 2024 and coming into force on 27 January 2025, establishing a single set of laws governing marriage, divorce, inheritance, and live-in relationships for the state's residents, with the specific exception of its Scheduled Tribe population (An Overview of the Uttarakhand Uniform Civil Code, Lawctopus, 2025). This legislative milestone, alongside the state's Gross Environmental Product index, illustrates a government willing to pursue genuinely novel policy instruments rather than confining itself to conventional development levers alone, a disposition this framework has sought to reflect throughout its sectoral analysis.

Uttarakhand's challenges remain, however, substantial and in some respects unique among Indian states. Its mountainous, seismically active terrain, spanning the Garhwal and Kumaon

divisions, has produced a recurring pattern of disaster events, from the 2013 Kedarnath flash floods to the 2021 Chamoli glacial lake outburst disaster, the 2023 Joshimath land subsidence crisis, and the November 2023 Silkyara tunnel collapse, each of which has tested the state's disaster preparedness and underscored the tension between rapid infrastructure expansion and geological fragility that runs throughout this report. The state's Char Dham Yatra pilgrimage circuit alone drew more than 3.3 million pilgrims in the early phase of its 2025 season, generating over Rs 306 crore in just 48 days and contributing to annual statewide pilgrimage tourism revenue exceeding Rs 7,500 crore (Uttarkashi, Grokipedia, 2026), a scale of visitor pressure on high altitude ecosystems that carries direct implications for the sustainable tourism, disaster risk, and environmental governance chapters that follow.

This report has been prepared following the same evidence based, APA seventh edition cited methodology established in the companion Kerala and Rajasthan frameworks, drawing on the state's own economic surveys, central government data, and contemporaneous policy documentation current as of mid-2026. Every statistic presented is dated to its original source, and where 2026 data was not yet available at the time of writing, the most recent verified figures have been used and clearly attributed. This report is offered as an independent, research driven contribution to the ongoing conversation among Uttarakhand's policymakers, researchers, and citizens who share an interest in charting a development pathway equal to both the state's economic ambition and its ecological responsibility.

Mihika Mathur

**In-charge, Uttarakhand Development Framework Project
Council for Comprehensive Development Frameworks
Youth Peace and Development Forum**

EXECUTIVE SUMMARY

Uttarakhand's development trajectory over the past five years has been defined by an unusual combination of rapid economic growth, landmark legal and environmental policy innovation, and recurring exposure to Himalayan disaster risk. The state's Gross State Domestic Product, projected at Rs 4.29 trillion for 2025-26, has grown at a compound annual growth rate of 8.86 per cent since 2018-19, with the most recent year alone recording 7.23 per cent growth and a 41 per cent rise in per capita income (Uttarakhand State Presentation Report, IBEF, 2026; Uttarakhand Committed to Viksit Bharat Goal, ANI, 2026). This Comprehensive Development Framework Report examines the state's progress and remaining gaps across twenty one sectoral chapters, situated within the state government's own stated ambition of contributing meaningfully to the national Viksit Bharat at 2047 vision while safeguarding the fragile Himalayan ecology on which its economy, water security, and disaster resilience all depend.

The state's population, estimated at 1.203 crore in 2026, remains modest by Indian standards, ranking Uttarakhand nineteenth among Indian states, but is distributed with striking unevenness across its thirteen districts (StatisticsTimes.com, 2026). Haridwar, Dehradun, and Udham Singh Nagar, the state's three plains districts, together account for a substantial share of the state's total population, while Uttarakhand's mountainous Garhwal and Kumaon districts, comprising the large majority of the state's land area, continue to experience persistent out-migration, a demographic imbalance that recurs throughout this framework's chapters on rural development, urban governance, and social justice.

Core Strategic Pillars

- **Sustaining the Viksit Uttarakhand at 2047 Trajectory:** Building on the state's 8.86 per cent compound annual GSDP growth rate, the government's stated ambition is to continue accelerating growth while diversifying the economy beyond its current concentration in tourism, hydropower, and pharmaceutical manufacturing, discussed in Chapters 3 and 4.
- **Institutionalising the Gross Environmental Product Framework:** As the first Indian state to formally measure ecological capital alongside conventional GSDP, Uttarakhand has an opportunity to embed environmental sustainability directly into fiscal and planning decisions rather than treating it as a parallel or secondary consideration, discussed in Chapters 13 and 14.
- **Consolidating the Uniform Civil Code's Implementation:** As the first state in independent India to implement a Uniform Civil Code, Uttarakhand's experience, including the litigation currently pending before the Uttarakhand High Court and Supreme Court, will shape both the state's own social governance and the broader national conversation on personal law reform, discussed in Chapter 15.
- **Himalayan Disaster Resilience:** Given the state's recurring exposure to flash floods, glacial lake outburst floods, land subsidence, and tunnel and infrastructure collapse, discussed in the specific context of Kedarnath, Chamoli, Joshimath, and Silkyara,

disaster risk reduction must be treated as a precondition for, rather than a constraint upon, the state's continued infrastructure and tourism expansion, discussed in Chapter 14.

- Sustainable Pilgrimage and Tourism Management: With the Char Dham Yatra alone drawing over 3.3 million pilgrims in the early phase of its 2025 season and statewide tourist arrivals reaching approximately 5.96 crore visitors, carrying capacity management has become an urgent priority rather than a theoretical planning concern, discussed in Chapter 19.

Uttarakhand's formation in 2000 reflected a long-standing regional movement for statehood rooted in the perception that the hill districts of undivided Uttar Pradesh had been persistently under-served relative to the plains. In the quarter century since, the state has achieved real convergence on several fronts, recording per capita income growth substantially above the national average in recent years, and recognition in the Achievers category for Ease of Doing Business and the Leaders category for Startup Rankings under the Department for Promotion of Industry and Internal Trade's state assessment frameworks (Uttarakhand CM Dharam Singh Celebrates Youth Empowerment, ANI, 2026). At the same time, the very geography that gives Uttarakhand its pilgrimage economy, its hydropower potential, and its ecological significance as the source of the Ganga and Yamuna river systems also makes it disproportionately exposed to climate driven disaster risk, a tension this framework treats not as a footnote but as a central organising theme running through its chapters on transport, energy, environment, and climate security.

This Comprehensive Development Framework has been developed to translate Uttarakhand's distinctive combination of economic ambition, policy innovation, and ecological responsibility into a sector by sector assessment grounded in the most current available data. The chapters that follow examine the state's geography and demography, its fiscal architecture, its economic structure, and each of the sectoral domains, from education and health to energy, environment, and administrative governance, that together will determine whether Uttarakhand's ambitious growth trajectory can be sustained in a manner consistent with the fragile Himalayan environment that gives the state both its name and its enduring significance.

CHAPTER 1: STATE PROFILE, GEOGRAPHY, DEMOGRAPHY AND SOCIETY

1.1 Geographic and Ecological Characteristics of the State

Uttarakhand covers a total area of 53,483 square kilometres, equivalent to 1.63 per cent of India's geographical area, positioning it among the smaller Indian states by land area yet one of the most topographically complex, given that the overwhelming majority of this territory consists of mountainous Himalayan terrain rather than plains (Uttarakhand, Forest Survey of India, 2019). The state lies between 28 degrees 43 minutes and 31 degrees 28 minutes north latitude and 77 degrees 34 minutes and 81 degrees 3 minutes east longitude, bordered by Himachal Pradesh to the northwest, Uttar Pradesh to the south, the Tibet Autonomous Region of China to the north, and Nepal to the east, giving the state a genuinely international frontier alongside its domestic borders (Uttarakhand, Forest Survey of India, 2019). This frontier position, discussed further in the administrative and security context of Chapters 8 and 15, carries strategic significance disproportionate to the state's modest size.

Uttarakhand's terrain divides broadly into five distinct physiographic zones running roughly parallel to one another from south to north: the Terai and Bhabar belt of the southern plains, the Shiwalik or outer Himalayan foothills, the lesser or lower Himalayan range, the greater Himalayan range containing the state's highest peaks and glaciers, and the trans-Himalayan zone along the Tibetan frontier. This vertical stratification, with elevation ranging from around 300 metres in the Terai plains to over 7,800 metres at Nanda Devi, the state's highest peak, produces an extraordinary range of climatic and ecological conditions within a comparatively compact land area, from subtropical forest in the foothills to alpine meadows and permanent snowfields at the highest elevations, discussed further in the biodiversity context of Chapter 13.

The state is popularly divided into two administrative and cultural regions, Garhwal in the west and Kumaon in the east, a distinction rooted in the historical princely states of Garhwal and Kumaon that predates the modern state's formation and continues to shape regional identity, political representation, and development planning discussed throughout this framework. Uttarakhand's population density stood at 189 persons per square kilometre as recorded in the 2011 Census, below the national average, though this aggregate figure conceals an extreme distributional imbalance between the state's densely populated plains districts and its sparsely populated high mountain districts, discussed further in section 1.3 (Uttarakhand, Forest Survey of India, 2019).

Uttarakhand's hydrological significance extends well beyond its own borders, since the state contains the source glaciers and headwaters of both the Ganga, originating at Gangotri, and the Yamuna, originating at Yamunotri, two of the river systems on which several hundred million people across the Indo-Gangetic plain depend for water security, discussed further in Chapter 10. This upstream position gives Uttarakhand's environmental governance, forest management, and glacial monitoring decisions, discussed in Chapters 13 and 14,

consequences that extend across much of northern India, a responsibility the state's recent Gross Environmental Product index, discussed in the Preface, was specifically designed to formalise within the state's own planning and fiscal architecture.

Seismically, Uttarakhand lies within Zone IV and Zone V of India's earthquake hazard classification, among the most seismically active regions of the country, a consequence of its position along the Main Central Thrust and Main Boundary Thrust fault systems where the Indian tectonic plate continues to collide with the Eurasian plate. This seismic vulnerability, combined with the state's steep slopes, high rainfall variability, and extensive glacial systems, produces a compound natural hazard profile, spanning earthquakes, landslides, flash floods, and glacial lake outburst floods, that recurs as a central theme throughout this framework's transport, energy, and disaster risk chapters.

Climatically, Uttarakhand experiences the full range of conditions typical of a Himalayan state with such extreme elevation variation, from a humid subtropical climate in the Terai and Bhabar belt, through a temperate climate across the middle Himalayan zone where most of the state's hill towns and agricultural terraces are situated, to an alpine and eventually tundra like climate at the highest elevations bordering Tibet. The south-west monsoon delivers the great majority of the state's annual precipitation between June and September, with rainfall intensity and distribution varying considerably across the state's physiographic zones, generally decreasing from south to north and from the outer to the inner Himalayan ranges, a pattern with direct implications for the agricultural cropping calendars and disaster risk profiles discussed in Chapters 14 and 18. Winter precipitation, occurring substantially as snowfall above approximately 2,000 metres elevation, sustains the glacial systems that feed the state's river network through the dry pre-monsoon months, making the timing and volume of winter snowfall an increasingly closely monitored indicator of the state's medium-term water security, discussed further in Chapter 10.

1.2 Administrative Divisions: Districts, Divisions and Sub-State Units

Uttarakhand comprises thirteen districts organised into two administrative divisions, Garhwal and Kumaon, broadly corresponding to the historical and cultural regions discussed in section 1.1 (Districts of Uttarakhand, PW Live, 2025). The Garhwal division comprises seven districts, Dehradun, Haridwar, Pauri Garhwal, Tehri Garhwal, Uttarkashi, Chamoli, and Rudrapur, while the Kumaon division comprises six districts, Nainital, Almora, Bageshwar, Champawat, Pithoragarh, and Udham Singh Nagar (Districts of Uttarakhand, PW Live, 2025). This thirteen district structure has remained comparatively stable since the state's formation in 2000, in notable contrast to the more frequent district level reorganisation seen in several other Indian states, reflecting both the state's smaller overall population base and the practical administrative challenges that further district subdivision would pose across such difficult mountainous terrain.

Each district is administered by a District Magistrate, with a Deputy Conservator of Forests from the Indian Forest Service responsible for forest administration within the district, and a Superintendent of Police responsible for law and order, a structure that assigns unusually

significant administrative weight to forest governance relative to most Indian states, reflecting the fact that a substantial majority of Uttarakhand's land area falls under some form of forest classification, discussed further in Chapter 13 (Districts of Uttarakhand, PW Live, 2025). Chamoli district is the largest by area at 8,030 square kilometres, followed closely by Uttarkashi at 8,016 square kilometres and Pithoragarh at 7,100 square kilometres, together illustrating that the state's largest districts by land area are also among its most sparsely populated and most difficult to administer given their extreme high altitude terrain (Uttarakhand Population 2025/2026, PopulationU, 2026).

Below the district level, Uttarakhand's rural governance operates through the standard three tier Panchayati Raj structure of Zila Panchayats, Kshetra Panchayats, and Gram Panchayats, discussed further in the rural governance context of Chapter 12, while urban governance is delivered through 11 municipal corporations, 43 municipal councils, and 47 nagar panchayats, with elections to these bodies held most recently in January 2025 across the majority of the state's urban local bodies (2025 Uttarakhand Local Elections, Wikipedia, 2026). The particular administrative complexity created by Uttarakhand's Char Dham pilgrimage towns, including Badrinath, Kedarnath, and Gangotri, which operate under distinct municipal governance timelines and requirements given their highly seasonal population and the overriding religious and heritage considerations attached to their development, discussed further in Chapter 19, represents a genuinely distinctive feature of the state's sub-state administrative architecture not replicated elsewhere in India at comparable scale.

Sub-state administrative units below the district level also include a number of cantonment boards, given the substantial presence of the Indian Army across Uttarakhand's border facing districts and its established hill station cantonments including Almora, Lansdowne, and Ranikhet, which operate under separate cantonment governance legislation rather than the standard municipal framework applicable elsewhere in the state. This layering of civil district administration, forest administration, pilgrimage town governance, and cantonment board jurisdiction within a comparatively small overall land area illustrates the genuinely distinctive administrative complexity Uttarakhand's state and district functionaries must navigate relative to most other Indian states of comparable population size.

1.3 Demographic Structure: Population, Density, Growth and Composition

Uttarakhand's population is estimated at approximately 1.203 crore, or 12.03 million, in 2026, having grown from 85 lakh recorded in the 2001 Census to 1.01 crore in the 2011 Census, a decadal growth rate of 18.81 per cent between 2001 and 2011 that itself represented a moderation of 1.6 percentage points from the growth rate recorded in the preceding decade (Uttarakhand Population 2026, StatisticsTimes.com, 2026). This places Uttarakhand as the nineteenth most populous Indian state, a ranking that has remained stable over the past century even as the state's absolute population has grown roughly sixfold from approximately 4.18 million at the turn of the twentieth century (Uttarakhand Population 2026, StatisticsTimes.com, 2026).

The state's population distribution across its thirteen districts is markedly uneven, with Haridwar the most populous district at approximately 2 million residents, followed by Dehradun at 1.7 million and Udham Singh Nagar at 1.65 million, meaning that the state's three plains and foothill districts alone account for a substantial share of Uttarakhand's total population despite constituting a comparatively small fraction of its total land area (Uttarakhand Population 2025/2026, PopulationU, 2026). This concentration stands in sharp contrast to the state's mountainous Garhwal and Kumaon districts, several of which, including Rudrapur, Bageshwar, and Champawat, record comparatively small populations spread across difficult, dispersed mountain terrain, a demographic imbalance driven substantially by sustained out-migration from the hill districts toward the plains districts and beyond the state entirely, a pattern examined in detail in the migration context of Chapter 20.

The state's sex ratio, recorded in the 2011 Census at 963 females per 1,000 males, itself reflects the consequences of this outmigration pattern, since working age men from the hill districts have historically migrated toward urban and plains employment in disproportionately greater numbers than women, leaving hill villages with a residual population skewed toward women, children, and the elderly, a phenomenon local researchers and policymakers have termed the feminisation of the hills. Uttarakhand's Total Fertility Rate stood at 1.9 children per woman as per the National Family Health Survey covering 2019-21, below the replacement level of 2.1 and a meaningful decline from 2.1 recorded in the 2015-16 round of the same survey, positioning Uttarakhand among the smaller number of Indian states that have already completed their fertility transition to below replacement levels (Uttarakhand Population 2025/2026, PopulationU, 2026).

Household composition data from the National Family Health Survey's fifth round found that more than two-thirds, or 67 per cent, of Uttarakhand's households are located in rural areas, with an average household size of 4.4 members, and that 21 per cent of households are headed by women, with 17 per cent of the state's total population living in female-headed households, a proportion notably higher than the national average and directly connected to the hill outmigration pattern discussed above (National Family Health Survey, DHS Program, 2021). This combination of below replacement fertility, sustained hill to plains internal migration, and a rising incidence of female-headed rural households together define the core demographic challenges that recur throughout this framework's chapters on rural development, gender equity, and social welfare.

Urbanisation in Uttarakhand remains comparatively modest in aggregate terms relative to the national trend, yet is proceeding rapidly within specific corridors, particularly the Dehradun-Haridwar-Rishikesh belt and the Haldwani-Kathgodam area of the Kumaon foothills, both of which have absorbed a disproportionate share of the state's internal hill to plains migration alongside migration from neighbouring Uttar Pradesh. The state's age structure remains comparatively youthful, though less markedly so than several of India's larger northern states, reflecting Uttarakhand's earlier fertility transition discussed above, meaning that the demographic dividend available to the state's economic planners is somewhat narrower in scope, and correspondingly more urgent to capture through the

employment and skilling priorities discussed in Chapters 3 and 5, than in states where fertility remains further above replacement level. The elderly dependency ratio in several of Uttarakhand's hill districts already exceeds the state average considerably, a direct consequence of the selective outmigration of the working age population discussed above, and carries specific implications for the elderly welfare and healthcare access priorities examined in Chapters 6 and 7.

1.4 Linguistic, Ethnic, Religious and Cultural Profile

Hindi serves as Uttarakhand's official language, alongside Sanskrit, which the state formally adopted as a second official language in 2010, a distinction Uttarakhand shares with only Himachal Pradesh among Indian states and one that reflects the state's status as home to some of Hinduism's most significant pilgrimage sites, discussed further in Chapter 19. Beyond these official languages, the state's population speaks a range of regional languages and dialects, principally Garhwali in the western Garhwal region and Kumaoni in the eastern Kumaon region, both Indo-Aryan languages with substantial oral and written literary traditions, alongside smaller populations speaking Jaunsari in the Jaunsar-Bawar region of Dehradun district and various Bhotia dialects among the state's high altitude trans-Himalayan communities near the Tibetan frontier.

Religiously, Uttarakhand's population is predominantly Hindu, comprising approximately 83 per cent of the state total, followed by Muslims at approximately 14 per cent, Sikhs at 2.34 per cent, and smaller populations of Jains, Christians, and Buddhists (Uttarakhand Population 2025/2026, PopulationU, 2026). Household level data from the National Family Health Survey's fifth round found that 85 per cent of Uttarakhand households have Hindu household heads, broadly consistent with this population level religious composition (National Family Health Survey, DHS Program, 2021). The state's Sikh population is concentrated substantially in the Udham Singh Nagar and Nainital districts of the Terai plains, reflecting historical post-partition agricultural settlement patterns, while the state's Muslim population is distributed across both the plains districts and several of the state's urban centres.

Ethnically, Uttarakhand's population reflects its historical division between the Garhwali and Kumaoni communities of the hill regions, each possessing distinct customary practices, folk traditions, and regional identities that continue to shape political representation and development priorities across the state, and the more recent, substantially plains-origin population of districts such as Udham Singh Nagar and Haridwar, whose demographic composition reflects twentieth century agricultural migration from Punjab and elsewhere in northern India following independence and partition. The state's Scheduled Tribe population, comprising communities including the Bhotia, Jaunsari, Tharu, Buksa, and Raji, is concentrated substantially in the state's border districts adjacent to Tibet and Nepal and in pockets of the Terai region, with distinct linguistic, customary, and livelihood traditions connected to their historically trans-Himalayan trade, pastoral, and forest dependent economies, discussed further in the social justice context of Chapter 7.

Uttarakhand's cultural profile is inseparable from its status as Devbhoomi, the Land of the Gods, anchored by the Char Dham pilgrimage circuit of Badrinath, Kedarnath, Gangotri, and Yamunotri, alongside numerous other sites of pan-Indian religious significance including Haridwar and Rishikesh on the banks of the Ganga, discussed extensively in Chapter 19. This religious and cultural inheritance, combined with the state's distinct Garhwali and Kumaoni folk music, dance, and craft traditions, forms a cultural asset base of considerable economic as well as spiritual significance, one that this framework treats as directly relevant to the state's tourism, creative economy, and heritage preservation strategies discussed in later chapters.

The state is additionally home to several semi-nomadic pastoral communities, most notably the Van Gujjars, who traditionally practise seasonal transhumance, moving buffalo herds between winter grazing grounds in the Terai forests and summer high altitude pastures known locally as bughals, a livelihood pattern increasingly constrained by forest protection regulations and shrinking grazing corridors, discussed further in Chapter 13. Uttarakhand's festival calendar, including the Kumaoni Holi's distinctive musical tradition, the Garhwali Harela festival marking the onset of the agricultural season, and numerous highly localised deity festivals specific to individual hill villages, reflects a cultural landscape that remains genuinely rooted in local agrarian and pastoral rhythms even as the state's broader economy diversifies into tourism, manufacturing, and services, a continuity this framework's creative economy chapter treats as an asset to be preserved deliberately rather than allowed to erode through unmanaged commercialisation.

1.5 Human Development Index: State Ranking and Trend Analysis

Uttarakhand's human development indicators reflect a state that has historically performed above the national average on several key metrics, a pattern consistent with its comparatively higher per capita income relative to many other Indian states. The state's literacy rate stood at 78.82 per cent as per the 2011 Census, meaningfully above the national average of 73 per cent, with male literacy recorded at 87.40 per cent and female literacy at 70.01 per cent, indicating a persistent but not unusually large gender gap in literacy relative to other Indian states (Education in Uttarakhand, Wikipedia, 2026). This comparatively strong literacy base, discussed further in the education context of Chapter 5, reflects the state's long tradition of educational institution building, particularly in the Garhwal and Kumaon hill regions, which historically produced disproportionate numbers of civil servants, teachers, and military personnel relative to the hill population's modest size.

On composite development tracking, Uttarakhand has recorded genuinely notable recent progress. NITI Aayog's SDG India Index 2023-24, the fourth edition of the country's principal sub-national Sustainable Development Goals tracking tool, identified Uttarakhand as the third fastest moving state nationally between the 2018 baseline and 2023-24, with the state's composite score rising by 19 points, trailing only Uttar Pradesh, which improved by 25 points, and Jammu and Kashmir, which improved by 21 points (Release of SDG India Index 2023-24, Press Information Bureau, 2026). This places Uttarakhand's rate of composite development improvement among the fastest of any Indian state over this six year period, a

finding that merits particular attention given that most of the other fastest improving states began this period from a considerably lower development baseline than Uttarakhand itself.

This aggregate progress, however, continues to mask significant intra-state variation between Uttarakhand's plains districts and its mountainous hill districts, a pattern this framework documents repeatedly across its education, health, and economic chapters. Human development outcomes in Dehradun, Haridwar, and Udham Singh Nagar, the state's three most populous and most economically diversified districts, generally exceed those recorded in the more remote hill districts of Uttarkashi, Chamoli, Bageshwar, and Pithoragarh, where difficult terrain continues to constrain access to quality healthcare, higher education, and formal sector employment, discussed further in the intra-state disparity context of section 1.7.

The state government's Gross Environmental Product index, discussed in the Preface, represents a deliberate effort to expand this human development tracking beyond conventional economic and social indicators to encompass ecological capital, an innovation that recognises, correctly in this framework's assessment, that human development in a state whose economy and disaster resilience are both directly dependent on Himalayan ecosystem health cannot be meaningfully assessed through economic and social indicators alone, without reference to the environmental foundation on which both ultimately depend.

1.6 Poverty, Inequality and Multidimensional Deprivation Indices

Uttarakhand has recorded a substantial and sustained decline in multidimensional poverty over the period covered by successive rounds of the National Family Health Survey. According to NITI Aayog's National Multidimensional Poverty Index, based on National Family Health Survey data, the share of Uttarakhand's population classified as multidimensionally poor fell from 17.67 per cent in 2015-16 to 9.67 per cent in 2019-21, an eight percentage point decline over roughly five years (On the Basis of NFHS 2019-21 Survey, Uttarakhand PCS Notes, 2025). This decline was considerably sharper in the state's rural areas, where multidimensional poverty fell from 21.87 per cent to 10.84 per cent, an 11.03 percentage point reduction, compared to a more modest decline from 9.89 per cent to 7 per cent in urban areas over the same period (On the Basis of NFHS 2019-21 Survey, Uttarakhand PCS Notes, 2025).

This considerably sharper rural poverty decline relative to the urban decline suggests that the national programmes driving multidimensional poverty reduction nationally, including improvements in nutrition, sanitation, access to clean cooking fuel, electricity, and housing, discussed in the broader national context in Chapter 6, have had particularly significant impact in Uttarakhand's rural and hill areas, where baseline deprivation levels were considerably higher at the start of this measurement period. Even so, the persistence of a meaningful gap between the state's rural and urban multidimensional poverty rates as of 2019-21, with rural poverty still exceeding urban poverty by more than three percentage points, indicates that Uttarakhand's rural, and particularly its hill district, population continues to experience disproportionate deprivation relative to the state's plains and urban centres.

Nationally, multidimensional poverty continued to decline sharply beyond the 2019-21 measurement window, with NITI Aayog's most recent estimates suggesting a further decline to approximately 11.28 per cent nationally by 2022-23, and with Uttarakhand's own SDG India Index Goal 1 performance, discussed in section 1.5, contributing to the state's broader composite score improvement over this period (Release of SDG India Index 2023-24, Press Information Bureau, 2026). Given the strong association documented nationally between multidimensional poverty reduction and improvements in nutrition, sanitation, and cooking fuel access, discussed further in Chapter 6, continued monitoring of whether Uttarakhand's hill districts are keeping pace with this national trajectory, rather than falling further behind the state's rapidly developing plains districts, represents an important priority for the state's poverty reduction strategy going forward.

Income inequality within Uttarakhand mirrors this rural-hill versus urban-plains poverty disparity, with the state's rapid recent GSDP growth, discussed in Chapter 3, concentrated substantially in Dehradun, Haridwar, and Udham Singh Nagar's industrial and services economies, while the hill districts' economies remain more heavily dependent on subsistence agriculture, remittances from out-migrant family members, and increasingly, pilgrimage and adventure tourism, discussed in Chapter 19. Addressing this persistent hill-plains development gap, rather than allowing the state's aggregate economic growth figures to obscure it, represents a central and recurring theme throughout this Comprehensive Development Framework.

This dependence on remittance income across much of hill Uttarakhand carries a further, less frequently examined inequality dimension, since households with at least one member successfully employed in the plains, in the Indian armed forces, a source of employment historically significant to Garhwali and Kumaoni households given the region's strong military recruitment tradition, or overseas, typically experience materially better living standards than households lacking such a remittance connection, even when both are nominally located within the same hill village and share broadly comparable access to local public services. This remittance driven, rather than purely locally generated, income disparity complicates conventional poverty measurement approaches, discussed further in the statistical strengthening context of Chapter 20, since a hill household's recorded consumption or asset ownership may reflect income earned hundreds of kilometres away rather than any genuine improvement in the local hill economy's productive capacity.

1.7 Intra-State Disparities: Aspirational Districts and Backward Region Identification

Uttarakhand's intra-state development disparities, discussed throughout this chapter, are most starkly illustrated by the persistent gap between the state's three plains and foothill districts, Dehradun, Haridwar, and Udham Singh Nagar, and its ten predominantly hill districts spanning the Garhwal and Kumaon divisions. This gap manifests not merely in income and poverty indicators, discussed in section 1.6, but in the sustained pattern of hill to plains and hill to out-of-state migration that has left several hill districts with declining or stagnant

populations even as the state's overall population continues to grow, a phenomenon that has given rise to the term ghost villages, referring to hill settlements substantially or entirely abandoned by their working age population, a subject explored further in the rural development context of Chapter 12.

Within this broader hill-plains disparity, certain districts and specific blocks warrant particular attention. Uttarakhand's border districts of Uttarkashi, Chamoli, and Pithoragarh, which share international frontiers with China and Nepal respectively, combine the general development challenges facing the state's hill districts with the additional strategic and logistical complexity of border area development, a consideration the central government's Vibrant Villages Programme has specifically sought to address by prioritising infrastructure, connectivity, and livelihood investment in villages along the international border with China, discussed further in the rural infrastructure context of Chapter 12 (Testbook, 2026). This programme's design, focused specifically on villages along the China border rather than extending uniformly across all of the state's border districts, reflects the particular strategic priority the central government attaches to sustaining population presence in these frontier settlements, both for development and for national security reasons.

Rudrapur, Bageshwar, and Champawat, the state's three smallest districts by population, illustrate a related but distinct dimension of intra-state disparity, combining small population bases with difficult terrain that raises the per capita cost of infrastructure and service delivery considerably above what comparable investment would achieve in the state's plains districts. This cost disparity, discussed further in the fiscal context of Chapter 2, means that achieving service delivery parity between Uttarakhand's hill and plains districts requires not merely proportionate but disproportionately higher per capita public investment in the state's most remote hill districts, a fiscal reality that the state's development planning has not always adequately reflected in practice.

Uttarakhand's own backward region identification efforts have historically centred on this hill-plains distinction more than on any formal, nationally designated Aspirational Districts Programme classification, since the state's districts have not featured prominently among NITI Aayog's national Aspirational Districts list in the manner seen in larger, more populous states. This does not mean intra-state backwardness is absent from Uttarakhand, however; rather, it indicates that the specific policy instrument of aspirational district designation, calibrated substantially to national poverty and deprivation thresholds, may be a less well suited diagnostic tool for capturing the particular combination of terrain driven service delivery cost, chronic outmigration, and border area strategic vulnerability that defines backwardness in Uttarakhand's hill districts specifically, a methodological consideration relevant to the statistical system strengthening priorities discussed in Chapter 20.

It is worth recalling that the hill-plains disparity documented throughout this chapter is not a recent phenomenon but rather the original grievance underlying the decades long popular movement for a separate hill state, which culminated in Uttarakhand's creation in November 2000 following sustained agitation rooted in the perception that the hill districts of undivided Uttar Pradesh had been systematically under-represented in development spending relative to

the plains. A quarter century after statehood, this framework's own analysis suggests that while the state's aggregate development indicators have improved substantially, discussed in section 1.5, the specific hill-plains imbalance that motivated the original statehood movement has not been fully resolved, and in some respects, given the concentration of the state's recent industrial and services growth in Dehradun, Haridwar, and Udham Singh Nagar discussed in Chapter 3, may have taken on a new form even as its underlying geographic contours remain broadly familiar to those who campaigned for the state's creation.

1.8 State's Position in National Rankings Across Key Development Indicators

Uttarakhand's position across various national ranking exercises reflects a state performing above the median on several economic and governance metrics while continuing to face the structural hill-plains disparities documented throughout this chapter. On the Department for Promotion of Industry and Internal Trade's state assessment frameworks, Uttarakhand has been recognised in the Achievers category for Ease of Doing Business and in the Leaders category for Startup Rankings, placing the state among the better performing Indian states on both business environment and entrepreneurship ecosystem metrics, discussed further in Chapters 4 and 17 (Uttarakhand CM Dhami Celebrates Youth Empowerment, ANI, 2026).

On composite Sustainable Development Goals tracking, Uttarakhand's position as the third fastest improving state nationally on the SDG India Index 2023-24, discussed in section 1.5, represents a particularly strong recent national ranking performance, indicating that whatever the state's continuing hill-plains disparities, its aggregate trajectory of improvement across the SDG framework's seventeen goal areas compares favourably with nearly every other Indian state over the 2018 to 2023-24 period (Release of SDG India Index 2023-24, Press Information Bureau, 2026). On per capita income, Uttarakhand's reported 41 per cent increase over the four years preceding 2026, discussed in the Preface, and its GSDP growth of 8.86 per cent compound annually since 2018-19, position the state among India's more rapidly growing state economies in relative terms, notwithstanding its comparatively modest absolute economic scale of approximately 4.29 trillion rupees (Uttarakhand State Presentation Report, IBEF, 2026).

On environmental and forest governance metrics, Uttarakhand's position is more complex. While the state's recorded forest area of 34,651 square kilometres, as of the 2011 State of Forest Report, constitutes a substantial majority of the state's total land area, considerably above the national average forest cover share, the India State of Forest Report 2023 specifically identified Uttarakhand as one of the states recording a net decrease in forest cover, losing approximately 54 square kilometres between the 2021 and 2023 assessments, attributed to urbanisation and road construction in the state's hilly terrain (Forest Cover by State in India, Grokipedia, 2026). This finding carries particular significance given the state's pioneering Gross Environmental Product index, discussed throughout this chapter, since it suggests that even as the state has moved to formally measure ecological capital, the underlying trend in one of that capital's most fundamental components, forest cover, has moved in the wrong direction during the most recent assessment period, a tension this framework examines further in the environmental governance chapters that follow.

On education and literacy specifically, Uttarakhand's 78.82 per cent literacy rate as of the 2011 Census, discussed in section 1.5, continues to place the state comfortably above the national average, a ranking position the state has generally sustained across subsequent education access indicators tracked through the Unified District Information System for Education and related national school education monitoring frameworks, discussed further in Chapter 5. On health infrastructure metrics, however, Uttarakhand's ranking position is considerably less favourable relative to its income and literacy standing, since the same mountainous terrain that constrains road and connectivity infrastructure, discussed in Chapter 8, also raises the effective cost and complexity of extending primary and secondary healthcare facilities to the state's dispersed hill population, a gap examined in detail in Chapter 6.

Taken together, these national ranking positions describe a state with genuine and, in several respects, distinctive strengths, in business environment, startup ecosystem development, composite SDG progress, and per capita income growth, operating alongside persistent structural vulnerabilities rooted in its mountainous geography, its chronic hill outmigration, and increasingly, direct evidence of environmental strain from the very infrastructure and urbanisation that has driven its economic growth. This combination of genuine achievement and unresolved structural tension forms the analytical throughline connecting this opening chapter to the fiscal, economic, and sectoral chapters that follow.

CHAPTER 2: FISCAL ARCHITECTURE OF THE STATE

2.1 Revenue Framework: Own Tax Revenue, Non-Tax Revenue and Devolution

Uttarakhand's revenue base for 2025-26 comprises total receipts, excluding borrowings, of Rs 62,565 crore, an increase of 6 per cent over the revised estimate for 2024-25 (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026). Of this, the state's own resources, own tax and non-tax revenue combined, account for approximately 45 per cent, or Rs 28,410 crore, while devolution and grants from the Centre account for the remaining 55 per cent, or Rs 34,130 crore, a composition that reflects Uttarakhand's continued substantial dependence on central transfers relative to larger and more industrialised Indian states, a dependence the same budget documents attribute explicitly to the state's limited industrial base and difficult geographical constraints (Uttarakhand Budget 2025-26 Overview, Scribd, 2026). This near even split between own resources and central transfers positions Uttarakhand among the more centrally dependent Indian states, notwithstanding its comparatively strong per capita income relative to many larger states.

Own tax revenue for 2025-26 is estimated at Rs 24,015 crore, an 8 per cent increase over the revised estimate for the previous year, with State Goods and Services Tax constituting the largest single component at 47 per cent of own tax revenue, itself projected to grow by 10 per cent over the 2024-25 revised estimate (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026). State excise revenue is projected to grow by 12 per cent over the same period, while revenue from taxes on vehicles is expected to grow by 11 per cent, having actually declined by 6 per cent at the revised estimate stage of 2024-25, illustrating a degree of year on year volatility in this particular revenue stream that the state's fiscal planners must continue to account for (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026). Own non-tax revenue, by contrast, is estimated at a comparatively modest Rs 4,395 crore for 2025-26, a decline of 4 per cent from the previous year's revised estimate, reflecting the more limited scope Uttarakhand's mountainous, forest dominated geography affords for the kind of mining royalty and industrial licensing revenue that larger, resource rich states are able to generate.

Own tax revenue as a share of GSDP has remained comparatively stable at approximately 6 per cent, recorded at 6 per cent in the actual figures for 2024-25 and projected at a marginally higher 6.1 per cent for 2026-27, a share considerably below what larger industrialised states typically achieve, underscoring the structural revenue constraint a small, mountainous, and comparatively less industrialised state economy imposes on Uttarakhand's own resource mobilisation capacity (Uttarakhand Budget Analysis 2026-27, PRS Legislative Research, 2026). Central transfers for 2025-26 comprise Rs 15,903 crore in the state's share of central taxes, an 11 per cent increase over the previous year, and Rs 18,227 crore in grants from the Centre, a more modest 0.5 per cent increase, together illustrating that tax devolution has grown considerably faster than grant based transfers in the most recent budget cycle (Uttarakhand Budget 2025-26 Overview, Scribd, 2026).

This comparatively low own tax to GSDP ratio must be understood against the specific structural features of Uttarakhand's economy discussed further in Chapter 3, particularly the state's substantial reliance on tourism and pilgrimage related consumption, agriculture, and a manufacturing sector concentrated in a small number of industrial belts around Haridwar and Udham Singh Nagar, none of which generate the kind of broad based, geographically distributed tax base that larger, more diversified state economies typically achieve. The state's revenue mobilisation strategy has consequently placed particular emphasis on strengthening compliance and collection efficiency within its existing tax handles, discussed further in the GST context of section 2.7, rather than pursuing significant new tax instruments, a pragmatic approach given the political and administrative difficulty of introducing genuinely new revenue sources within a state economy of Uttarakhand's comparatively modest scale.

2.2 Expenditure Profile: Composition, Quality and Efficiency

Total expenditure for Uttarakhand in 2025-26, excluding debt repayment, is budgeted at Rs 75,170 crore, a 9 per cent increase over the revised estimate for 2024-25, with the state's total budget outlay, inclusive of debt servicing and all other heads, reaching approximately Rs 1,01,175.33 crore for the year (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026; Uttarakhand Budget 2025-26, Drishti IAS, 2026). This expenditure envelope grew further in the subsequent budget cycle, with total expenditure excluding debt repayment for 2026-27 targeted at Rs 83,543 crore, a further 10 per cent increase, and the state's overall budget outlay reaching approximately Rs 1,11,703 crore, one of the largest single year budgets in the state's twenty five year history (Uttarakhand Budget Analysis 2026-27, PRS Legislative Research, 2026).

Within this expenditure envelope, committed expenditure continues to represent a substantial recurring cost, with pension payments alone reaching Rs 9,917 crore in 2025-26, equivalent to approximately 16 per cent of total expenditure excluding debt repayment, and interest payments on the state's existing debt stock reaching Rs 6,990 crore, or approximately 11 per cent of the same expenditure base (Uttarakhand Budget 2025-26 Overview, Scribd, 2026). Together, these two committed expenditure categories alone account for more than a quarter of the state's total non-debt expenditure, a structural constraint on fiscal flexibility common across most Indian states but felt with particular intensity in Uttarakhand given the comparatively modest scale of the state's overall revenue base discussed in section 2.1.

Sectoral expenditure allocation for 2025-26 shows education receiving the largest single sectoral share at 16.7 per cent of total expenditure, above the 15 per cent average allocation recorded across 31 Indian states in 2024-25, while health receives 6.4 per cent, marginally above the 6.2 per cent state average, and rural development receives 5.8 per cent, above the 5.1 per cent state average (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026). By contrast, allocation to roads and bridges fell to 3.0 per cent from 4.3 per cent the previous year, and energy sector allocation fell sharply to 1.9 per cent from 5.0 per cent, while water and sanitation allocation rose from 2.5 per cent to 4.2 per cent, a set of sectoral reallocations that reflects the state government's explicit prioritisation, discussed further in

section 2.3, of water security and social sector spending within a constrained overall fiscal envelope even as certain infrastructure categories saw their relative budget share decline.

This above average allocation to education, health, and rural development, set against below average allocation to roads, bridges, and energy relative to the 31 state average, reflects a deliberate policy choice by the state government to prioritise human capital and basic service delivery spending within a fiscal envelope that, as discussed in section 2.1, remains considerably more constrained on the revenue side than that of India's larger and more industrialised states. Whether this sectoral allocation pattern represents the appropriate long-term balance for a state whose connectivity infrastructure deficit, discussed in Chapter 8, continues to constrain both economic growth and disaster resilience, discussed in Chapter 14, is a question this framework returns to across its infrastructure focused chapters, since underinvestment in roads and energy infrastructure in the near term could plausibly generate offsetting costs in reduced growth and elevated disaster vulnerability over the medium to long term that are not fully captured within a single year's budget allocation analysis.

2.3 Capital Expenditure: Infrastructure Investment and Asset Creation

Capital outlay for Uttarakhand in 2025-26 is budgeted at Rs 14,763 crore, a substantial 25 per cent increase over the previous year's revised estimate, reflecting the state government's stated priority of accelerating long-term asset creation even within a comparatively constrained overall revenue base (Uttarakhand Budget 2025-26 Overview, Scribd, 2026). This capital expenditure programme is directed substantially toward road infrastructure, with the 2025-26 budget specifically allocating funds for 220 kilometres of new road construction, 1,500 kilometres of road renovation, and 1,000 kilometres of road reconstruction, an infrastructure investment scale that reflects both the state's continuing connectivity deficit in its hill districts, discussed in Chapter 8, and the accelerated wear that Uttarakhand's mountainous terrain and heavy monsoon rainfall impose on existing road infrastructure (Uttarakhand Budget 2025-26 Overview, Scribd, 2026).

Major discrete capital projects reflected within this capital expenditure programme include continued construction of the Rishikesh-Karnaprayag Rail Project, discussed further in Chapter 8, and expansion of heliport infrastructure under the central government's UDAN regional connectivity scheme, both explicitly highlighted within the state's 2025-26 budget as flagship infrastructure priorities marking the milestone twenty fifth anniversary of Uttarakhand's statehood (The Uttarakhand Budget 2025-2026 Focuses on the GYAN Formula, Testbook, 2026). The Manaskhand Mandir Mala Mission, a dedicated capital programme to develop temple infrastructure across the Kumaon region with the explicit objective of replicating the tourism success of the Garhwal region's Char Dham circuit, represents a further significant capital allocation with direct relevance to the tourism infrastructure priorities discussed in Chapter 19 (The Uttarakhand Budget 2025-2026 Focuses on the GYAN Formula, Testbook, 2026).

Capital expenditure quality within Uttarakhand's fiscal history has not always matched this recent growth in ambition. Comptroller and Auditor General reporting on the state's finances

during the Fourteenth Finance Commission period found that the average return on the state government's investment in statutory corporations, rural banks, joint stock companies, and cooperatives ranged from just 0.004 to 0.71 per cent across successive five year assessment periods, while the government paid an average interest rate of between 7.96 and 8.18 per cent on the borrowed funds used to finance these investments, a differential that represents a substantial and sustained fiscal drain (Audit Reports, Comptroller and Auditor General of India, various years). Ensuring that the current, considerably larger capital expenditure programme avoids repeating this historical pattern of poor return on public investment represents an important governance priority connected to the public sector undertaking reform discussed in Chapter 4.

2.4 Fiscal Deficit, Primary Deficit and Debt Sustainability

Uttarakhand's fiscal deficit trajectory has shown a pattern of successive upward revision in recent budget cycles. The fiscal deficit for 2025-26 was originally targeted at 2.9 per cent of GSDP, or Rs 12,605 crore, but the revised estimate for the year came in considerably higher at 3.4 per cent of GSDP, itself exceeding the 2024-25 revised estimate of 2.5 per cent of GSDP, which had already exceeded the original budgeted target of 2.4 per cent for that year (Uttarakhand Budget Analysis 2026-27, PRS Legislative Research, 2026). This pattern continued into the 2026-27 budget cycle, with the fiscal deficit targeted at 3.7 per cent of GSDP, or Rs 15,989 crore, a figure higher than even the revised 3.4 per cent recorded for 2025-26, indicating that the state's actual borrowing requirement has consistently outpaced its own initial budgetary projections across at least three consecutive fiscal years (Uttarakhand Budget Analysis 2026-27, PRS Legislative Research, 2026).

This upward fiscal deficit trajectory sits in some tension with the Uttarakhand Fiscal Responsibility and Budget Management Act of 2005, which establishes annual targets for the progressive reduction of the state's outstanding debt, revenue deficit, and fiscal deficit, and which conventionally caps the fiscal deficit at 3 per cent of GSDP under the standard Finance Commission glide path (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026). The state's revenue account, by contrast, has remained in comparatively healthier territory, recording a revenue surplus of 0.6 per cent of GSDP, or Rs 2,586 crore, in 2025-26, a modest decline from the 0.8 per cent of GSDP revenue surplus recorded at the revised estimate stage of 2024-25, but nonetheless indicating that the state's day to day revenue and expenditure balance remains positive even as its overall, capital expenditure inclusive fiscal deficit has widened (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026).

Uttarakhand's outstanding debt stood at approximately 25 per cent of GSDP as of the 2025-26 budget, a level that historical Comptroller and Auditor General assessments during the Fourteenth Finance Commission period found had, in certain years, exceeded the Commission's own normative debt-GSDP target of approximately 22.6 to 22.7 per cent (Audit Reports, Comptroller and Auditor General of India, various years; Uttarakhand Budget 2025-26 Overview, Scribd, 2026). Given that the state continues to record fiscal deficits above the 3 per cent FRBM ceiling in its most recent budget cycles, discussed above,

sustaining debt sustainability over the medium term will require either accelerated own revenue growth, discussed in section 2.1, or a deliberate moderation of the state's currently expansionary capital expenditure trajectory, discussed in section 2.3, a genuine policy tension this framework returns to in the state's long-term financing strategy discussed in Chapter 21.

The primary deficit, which excludes interest payments from the overall fiscal deficit calculation and thereby offers a clearer picture of the state's current period borrowing requirement independent of the debt service burden inherited from past borrowing decisions, has similarly widened alongside the headline fiscal deficit discussed above, given that interest payments of Rs 6,990 crore in 2025-26, discussed in section 2.2, constitute a comparatively modest share of the overall Rs 12,605 crore fiscal deficit for the same year. This suggests that the majority of Uttarakhand's current fiscal deficit reflects genuinely new borrowing to finance current period capital expenditure and revenue commitments, discussed in sections 2.2 and 2.3, rather than being driven predominantly by the accumulated interest burden of historical debt, a distinction that carries some reassurance for the state's medium term debt sustainability outlook provided the capital expenditure being financed generates commensurate future economic returns.

2.5 State's Borrowings, Guarantees and Off-Budget Liabilities

Uttarakhand finances its fiscal deficit substantially through market borrowings, with net borrowings for 2025-26 estimated at Rs 12,464 crore, rising to Rs 14,429 crore in the 2026-27 budget, alongside continued debt repayment obligations of Rs 26,006 crore in 2025-26 alone, illustrating the scale of debt servicing the state must manage even as it continues to add new borrowing to finance its expanding capital expenditure programme discussed in section 2.3 (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026; Uttarakhand Budget Analysis 2026-27, PRS Legislative Research, 2026). Government guarantees extended by the state, typically used to support borrowing by state public sector undertakings and other state controlled entities without that borrowing appearing directly on the state's own balance sheet, stood at a comparatively modest Rs 106 crore, or 0.02 per cent of GSDP, as of the 2025-26 budget, a considerably smaller contingent liability exposure than several other Indian states carry through their guarantee portfolios (Uttarakhand Budget 2025-26 Overview, Scribd, 2026).

Notwithstanding this comparatively modest formal guarantee exposure, the poor historical return on the state's investments in statutory corporations and joint stock companies, discussed in section 2.3, represents a form of embedded fiscal risk that does not always register clearly within conventional fiscal deficit and guarantee reporting, since capital that has been invested in chronically underperforming public entities effectively constitutes a sunk fiscal cost even where no formal guarantee has been triggered. The Comptroller and Auditor General's continued scrutiny of specific public sector undertakings, including the Power Transmission Corporation of Uttarakhand Limited's project management practices, examined in the Comptroller and Auditor General's Report No. 3 of 2025, reflects sustained institutional attention to this dimension of the state's off-budget and quasi-fiscal risk exposure

(Government of Uttarakhand, Report No. 3 of 2025, Comptroller and Auditor General of India, 2025).

Given the state's comparatively modest own revenue base discussed in section 2.1, and its rapidly growing capital expenditure programme discussed in section 2.3, maintaining transparent and comprehensive reporting of all forms of contingent and off-budget liability, extending beyond formal government guarantees to encompass the effective fiscal exposure created by underperforming public sector investments, represents an important public financial management priority for the state's Finance Department, discussed further in the audit compliance context of section 2.8.

Uttarakhand's comparatively low formal guarantee exposure relative to the debt sustainability concerns documented in section 2.4 suggests that the state's most pressing borrowing risk lies less in contingent liabilities crystallising unexpectedly and more in the direct, on-balance-sheet debt accumulation associated with its widening fiscal deficit, a distinction with practical implications for how the state's Finance Department should prioritise its risk monitoring resources. Rather than investing disproportionate monitoring capacity in guarantee exposure tracking, a genuine but comparatively contained risk given the modest Rs 106 crore figure discussed above, the state's fiscal risk management framework would likely generate greater value by focusing on the direct debt sustainability analysis discussed in section 2.4 and on strengthening the return generated by the state's existing portfolio of public sector investments discussed in section 2.3.

2.6 Finance Commission Awards: Allocation and Utilisation

Uttarakhand's Finance Commission grant receipts for 2025-26 include a substantial grants-in-aid component of Rs 16,219 crore, as documented in the Comptroller and Auditor General's Report No. 3 of 2025, spanning a range of Finance Commission recommended sectoral grants alongside centrally sponsored scheme transfers (Government of Uttarakhand, Report No. 3 of 2025, Comptroller and Auditor General of India, 2025). As a state that continues to receive Post Devolution Revenue Deficit Grants under the Finance Commission framework, Uttarakhand's continued eligibility for this category of grant reflects the Finance Commission's ongoing assessment that the state's revenue capacity remains insufficient to meet its expenditure needs even after standard tax devolution, a finding consistent with the state's comparatively modest own tax revenue to GSDP ratio discussed in section 2.1.

The Fourteenth Finance Commission's normative fiscal deficit target of 3.25 per cent of GSDP for Uttarakhand, referenced in historical Comptroller and Auditor General assessments, was itself somewhat more permissive than the 3 per cent ceiling that has typically applied to other states under the same Commission's framework, an allowance that reflected the Commission's recognition of the particular fiscal challenges facing a small, mountainous, and infrastructure deficient state (Audit Reports, Comptroller and Auditor General of India, various years). Whether the subsequent Fifteenth and Sixteenth Finance Commissions have extended comparable special category consideration to Uttarakhand's fiscal deficit ceiling represents an important, and from the perspective of this framework's

fiscal sustainability analysis in section 2.4, consequential question for the state's continued debt management strategy, one that the state's Finance Department should treat as a priority advocacy issue in its ongoing engagement with successive Finance Commissions.

Local body devolution under successive Finance Commission awards has extended to Uttarakhand's Panchayati Raj Institutions and Urban Local Bodies, discussed further in the rural and urban governance contexts of Chapters 11 and 12, with the state's comparatively small number of urban local bodies, eleven municipal corporations, forty three municipal councils, and forty seven nagar panchayats discussed in Chapter 1, receiving devolution calibrated to the Finance Commission's national formula alongside state specific top-up allocations reflecting the elevated per capita cost of extending municipal services across the state's dispersed hill town geography. Ensuring that this local body devolution genuinely reaches the state's smallest and most remote nagar panchayats, rather than concentrating disproportionately in the state's larger municipal corporations, represents an important equity consideration within the broader Finance Commission utilisation strategy.

Utilisation of Finance Commission and centrally sponsored scheme grants within Uttarakhand also carries particular administrative complexity given the state's mountainous terrain, discussed in Chapter 1, since grant utilisation timelines calibrated to plains conditions frequently prove impractical for infrastructure and service delivery projects in the state's remote hill districts, where seasonal weather conditions, limited construction seasons, and difficult material transport logistics can extend project implementation well beyond the standard grant utilisation periods that Finance Commission and central ministry guidelines typically prescribe. Advocating for terrain adjusted grant utilisation timelines, rather than requiring Uttarakhand's hill district implementing agencies to meet identical deadlines to those applicable in plains states, represents a specific and actionable Finance Commission engagement priority that would meaningfully improve the state's grant utilisation efficiency without requiring any change to the underlying grant allocation formula itself.

2.7 GST Implementation: Revenue Impact and Compensation Status

Uttarakhand's Goods and Services Tax regime operates under the Uttarakhand Goods and Services Tax Act of 2017, passed by the state legislature in May 2017 and effective from 1 July 2017, aligned with the national rollout of the GST framework across all Indian states (Government of Uttarakhand, Comptroller and Auditor General of India, 2021). State GST collections have shown strong sustained growth in recent years, rising from Rs 5,973.36 crore in 2021-22 to Rs 7,340.64 crore in 2022-23, an increase of Rs 1,367.28 crore, or 22.89 per cent, reflecting both underlying economic growth discussed in Chapter 3 and improving tax compliance within the state's Commercial Tax Department (CAG Points at Errors in Budget Documents, Hindustan Times, 2024). This growth trajectory has continued into the most recent budget cycles, with State GST projected to grow by a further 10 per cent in 2025-26 over the revised estimate for 2024-25, and State GST now constituting the single largest component of the state's own tax revenue at 47 per cent, discussed in section 2.1 (Uttarakhand Budget Analysis 2025-26, PRS Legislative Research, 2026).

The compensation mechanism established under the GST (Compensation to States) Act of 2017, which guaranteed states protection against revenue shortfalls relative to a protected growth trajectory during the scheme's initial transition period, applied to Uttarakhand alongside other states during the early years of GST implementation, with the state's protected revenue and actual collection tracked and reconciled through the compensation fund mechanism (Government of Uttarakhand, Comptroller and Auditor General of India, 2021). Since the national lapse of this compensation mechanism in 2022, Uttarakhand, like other Indian states, has borne full exposure to actual GST collection performance without the previous revenue growth guarantee, placing renewed importance on the kind of sustained compliance improvement reflected in the state's recent GST collection growth figures discussed above.

The Comptroller and Auditor General's continued audit attention to the state's GST administration, including a specific compliance audit paragraph on the Department's oversight of GST payments and return filing included within Report No. 3 of 2025, indicates that implementation gaps, including potential underreporting, delayed filing, or inadequate departmental monitoring of taxpayer compliance, remain an active area of institutional scrutiny notwithstanding the state's genuinely strong recent GST revenue growth trajectory (Government of Uttarakhand, Report No. 3 of 2025, Comptroller and Auditor General of India, 2025). Given the tourism and pilgrimage driven consumption patterns discussed in Chapter 19, GST collection in Uttarakhand also carries a distinctive seasonal profile relative to more industrially diversified states, with hospitality, transport, and retail related GST collection typically peaking during the Char Dham Yatra season, a pattern that adds a further dimension of forecasting complexity to the state's revenue planning discussed throughout this chapter.

2.8 Public Financial Management Reforms and Audit Compliance

The Comptroller and Auditor General's Accountant General office in Dehradun conducts regular compliance and performance audits across Uttarakhand's civil administration, public sector enterprises, and centrally sponsored scheme implementation. Report No. 3 of 2025, tabled before the state legislature in September 2025, examined a wide range of subjects including the Uttarakhand Disaster Recovery Project's additional financing, implementation of the Pradhan Mantri Kaushal Vikas Yojana 2.0 skill development scheme, infrastructure development under the central PRASHAD and Swadesh Darshan pilgrimage and heritage tourism schemes, management and execution of Kumbh Mela works, short levy of stamp duty and registration fee due to document misclassification, establishment and utilisation of Modern Record Rooms under the Digital India Land Records Modernization Programme, the department's oversight of GST payments and return filing discussed in section 2.7, and project management by the Power Transmission Corporation of Uttarakhand Limited, alongside fifteen further compliance audit paragraphs spanning eleven departments and two public sector undertakings (Government of Uttarakhand, Report No. 3 of 2025, Comptroller and Auditor General of India, 2025).

This breadth of audit coverage, spanning disaster recovery financing, skill development, pilgrimage tourism infrastructure, land record digitisation, and public sector enterprise project management, reflects both the genuine diversity of Uttarakhand's public expenditure footprint and the Comptroller and Auditor General's institutional mandate to examine value for money across the full range of government activity. Earlier Comptroller and Auditor General reporting has also identified more basic public financial management weaknesses, including a 2023 finding of discrepancies in the depiction of budget provisions within the state's own 2022-23 budget documents, specifically the misclassification of interest for the New Pension Scheme and the transfer of the interest CAMPA fund under incorrect account heads, alongside broader findings of unauthorised sub-major and minor budget heads and misclassification between revenue and capital expenditure sections (CAG Points at Errors in Budget Documents, Hindustan Times, 2024).

These findings, while individually modest in fiscal magnitude, point to a recurring pattern of budget documentation and classification weakness that, if left unaddressed, could complicate the kind of rigorous fiscal deficit and debt sustainability monitoring discussed in section 2.4, since accurate policy analysis and Finance Commission assessment depend fundamentally on budget documents that correctly classify revenue against capital expenditure and accurately depict the fiscal provisions the state legislature has actually approved. Strengthening budget documentation quality control within the state's Finance Department, informed directly by these Comptroller and Auditor General findings, represents a comparatively low cost but consequential public financial management reform priority, one that could be addressed through improved staff training and stronger internal review procedures without requiring significant new fiscal outlay.

Comparing the Comptroller and Auditor General's more recent audit findings, discussed above, against the historical audit record from the Fourteenth Finance Commission period discussed in sections 2.3 and 2.4, suggests a pattern of persistent, rather than episodic, public financial management weakness across successive state governments and Finance Commission cycles, spanning both the earlier era's poor public sector enterprise investment returns and the more recent era's budget documentation misclassification findings. This persistence indicates that isolated corrective responses to individual Comptroller and Auditor General findings, while necessary, are unlikely on their own to resolve the underlying institutional capacity constraints within the state's Finance Department that appear to generate these recurring findings across different subject areas and different time periods, pointing instead toward the need for a more systemic public financial management capacity building programme, potentially delivered in partnership with the state's Administrative Training Institute discussed in Chapter 15.

2.9 Centre-State Fiscal Relations: Trends and Themes

Uttarakhand's fiscal relationship with the Union government reflects the state's position as a comparatively small, revenue constrained, but strategically significant Himalayan border state, discussed throughout Chapter 1, whose continued development depends substantially on sustained central government support extending well beyond standard Finance

Commission devolution alone. The state's near even split between own resources and central transfers, discussed in section 2.1, at approximately 45 per cent own resources against 55 per cent central transfers, illustrates a degree of central fiscal dependence that positions Uttarakhand's Centre-state fiscal relationship as considerably more central government dependent than that of India's larger, more industrialised states.

This central dependence has coincided with substantial and continuing central government investment in flagship infrastructure and connectivity projects within the state, including the Rishikesh-Karnaprayag Rail Project and UDAN heliport expansion discussed in section 2.3, alongside continued central funding support for disaster recovery, skill development, and pilgrimage tourism infrastructure documented in the Comptroller and Auditor General's Report No. 3 of 2025 discussed in section 2.8. The state government's explicit framing of its 2025-26 budget, marking the milestone twenty fifth anniversary of Uttarakhand's statehood, around the GYAN formula of Garib, Yuva, Annadata, and Nari Shakti, and its stated alignment with the national Viksit Bharat at 2047 mission, discussed in the Preface, together illustrate a state government actively positioning its own development priorities as complementary to, rather than independent of, the Union government's broader national development agenda (The Uttarakhand Budget 2025-2026 Focuses on the GYAN Formula, Testbook, 2026).

Sustaining this productive Centre-state fiscal relationship over the coming Finance Commission cycle, while simultaneously working to narrow the fiscal deficit trajectory documented in section 2.4 and strengthen the own revenue base discussed in section 2.1, represents the central fiscal policy challenge facing Uttarakhand's government over the medium term. Given the state's continuing dependence on central transfers, any future recalibration of Finance Commission devolution criteria toward metrics that disadvantage smaller, less industrialised states, a dynamic already observed in other Indian states' recent Finance Commission experience, would carry particular significance for Uttarakhand's fiscal sustainability, underscoring the importance of the state's continued active engagement with national planning platforms and its consistent, demonstrated capacity to translate central investment into visible infrastructure and service delivery outcomes, a theme this framework returns to in the discussion of the state's long-term financing strategy in Chapter 21. The disaster recovery financing relationship documented throughout this chapter, in particular, illustrates a further distinctive dimension of Uttarakhand's Centre-state fiscal relations not experienced at comparable scale by most other Indian states, since the state's recurring exposure to major disaster events, discussed in Chapter 14, means that central disaster relief and reconstruction financing constitutes a structurally recurring, rather than occasional, feature of the state's fiscal relationship with the Union government.

This chapter's fiscal analysis, taken as a whole, describes a state government pursuing a genuinely expansionary capital investment agenda, reflected in the 25 per cent growth in capital outlay discussed in section 2.3 and the flagship infrastructure projects marking the state's twenty fifth anniversary of statehood, financed against a comparatively narrow own revenue base and a fiscal deficit trajectory that has consistently exceeded its own initial

budgetary targets across successive years, discussed in section 2.4. Whether this combination proves fiscally sustainable over the coming Finance Commission cycle will depend substantially on the state's success in the specific reform priorities identified throughout this chapter: strengthening own tax buoyancy beyond its currently modest GSDP share, discussed in section 2.1, improving the historically poor return on public sector investment, discussed in section 2.3, and resolving the recurring budget documentation weaknesses that Comptroller and Auditor General audits have repeatedly identified, discussed in section 2.8. These fiscal foundations, examined in full throughout this chapter, underpin the sector specific financing considerations discussed across the remainder of this framework, and are returned to directly in the state's long-term financing strategy discussion in Chapter 21.

CHAPTER 3: ECONOMIC STRUCTURE, GROWTH AND SECTORAL PERFORMANCE

3.1 Gross State Domestic Product: Trends, Growth Rate and Sectoral Share

Uttarakhand's Gross State Domestic Product at current prices is projected to reach Rs 4.29 trillion, or approximately 50.26 billion dollars, in 2025-26, having grown at a compound annual growth rate of 8.86 per cent between 2018-19 and 2025-26 (Uttarakhand State Presentation and Economy Growth Report, IBEF, 2026). This nominal growth trajectory has been considerably more rapid than the state's long-run real growth performance, since real GSDP grew at an average rate of just 5.4 per cent between 2012-13 and 2021-22, marginally below the national average real growth rate of 5.6 per cent over the same period, indicating that a meaningful share of the state's recent headline GSDP growth reflects price effects and post-pandemic recovery rather than a sustained acceleration in underlying real economic capacity (Macro and Fiscal Landscape of the State of Uttarakhand, NCAER-NITI Aayog, 2025). At constant prices, real GSDP growth reached 7.6 per cent in 2023-24, before moderating to an estimated 6.6 per cent in 2024-25, below the previous year's pace, suggesting some deceleration in the state's real growth momentum even as nominal GSDP continues to expand rapidly (Economy of Uttarakhand, Grokipedia, 2026).

The sectoral composition of Uttarakhand's economy shows manufacturing contributing 47 per cent of GSDP and services contributing 43 per cent in 2023-24, with agriculture accounting for the remaining 10 per cent, a composition that reflects the state's comparatively industrialised economic structure relative to many other Indian states, driven substantially by the SIDCUL industrial estates discussed in section 3.4 (Economy of Uttarakhand, Grokipedia, 2026). This manufacturing led sectoral composition distinguishes Uttarakhand from most other Himalayan and hill states, whose economies typically remain more heavily weighted toward services and agriculture, and reflects the deliberate industrial policy choices the state has pursued since its formation in 2000, discussed further in Chapter 4.

Uttarakhand's GSDP has grown more than thirteen fold at constant prices since the state's formation, from Rs 24,786 crore in the 2004-05 financial year to Rs 3.33 lakh crore by 2023-24, with real GSDP growing at a compound annual growth rate of 13.7 per cent during the state's earliest years between 2005 and 2012, a period of exceptionally rapid, low base industrial expansion following the extension of central excise and income tax exemptions to new industrial units established in the state (Economy of Uttarakhand, Wikipedia, 2026). While this initial post-formation growth surge has since moderated considerably, as reflected in the more recent 5.4 to 7.6 per cent real growth figures discussed above, the state's overall economic scale has nonetheless expanded dramatically over its twenty five year history. The state's share of India's overall GDP remains modest, at approximately 1.2 per cent as of 2021-22, reflecting Uttarakhand's comparatively small population and land area relative to the country's larger states, even as its per capita economic performance, discussed in section

3.2, compares considerably more favourably (Macro and Fiscal Landscape of the State of Uttarakhand, NCAER-NITI Aayog, 2025).

This trajectory of an initial tax incentive driven industrial boom followed by a more moderate, broadly diversified growth phase carries important lessons for how the state's economic planners should interpret its current growth ambitions, discussed throughout this framework. The 2005 to 2012 period's exceptional 13.7 per cent compound annual growth rate was substantially a function of the central excise duty exemption scheme specific to newly established industrial units in hill states, a fiscal incentive structure that inevitably produced a front-loaded surge in industrial investment as firms sought to establish operations before more favourable early scheme provisions were revised, rather than reflecting a sustainable underlying growth rate the state could expect to maintain indefinitely. The subsequent moderation to a still respectable but considerably lower 5.4 to 8.86 per cent range across various measurement periods discussed above likely represents a more accurate baseline for assessing the state's genuine, incentive independent growth capacity, a distinction with direct relevance for the state's own long-term Vision 2047 planning discussed in Chapter 21.

3.2 Per Capita Income and Purchasing Power Analysis

Uttarakhand's per capita income has grown substantially in recent years and now exceeds the national average by a meaningful margin. Per capita income in the state stood at Rs 2,61,173 in the 2022-23 financial year, compared to a national average of approximately Rs 2.12 lakh for the same year, positioning Uttarakhand's per capita income roughly 23 per cent above the national figure (Economy of Uttarakhand, Wikipedia, 2026). More recent NITI Aayog assessment places Uttarakhand's nominal per capita income at approximately 40 per cent above the national average, while Chief Minister Pushkar Singh Dhami has reported a 41 per cent increase in per capita income over the four years preceding 2026, discussed in the Preface, indicating that the gap between Uttarakhand's per capita income and the national average has continued to widen in the state's favour over the most recent budget cycles (Macro and Fiscal Landscape of the State of Uttarakhand, NCAER-NITI Aayog, 2025; Uttarakhand Committed to Viksit Bharat Goal, ANI, 2026).

Per capita GSDP, a related but distinct measure calculated directly from the state's Gross State Domestic Product rather than net income, stood at Rs 2,95,751 in 2023-24, an increase of 13 per cent over the previous year, broadly consistent with the state's overall nominal GSDP growth trajectory discussed in section 3.1 (Economy of Uttarakhand, Grokipedia, 2026). This above national average per capita income position, achieved despite the state's comparatively modest overall GSDP scale and its persistent hill-plains disparities discussed throughout Chapter 1, reflects Uttarakhand's relatively small population base relative to its economic output, and should not be interpreted as evidence that income is evenly distributed across the state's population.

Purchasing power within Uttarakhand varies considerably between the state's industrialised plains districts, where per capita income and consumption levels closely track the state

average or exceed it, and its more remote hill districts, where the remittance dependent economy discussed in Chapter 1 means that recorded local income figures frequently understate genuine household purchasing power, since a meaningful share of hill household consumption is financed by income earned elsewhere and transferred back to the household of origin. This distinction between locally generated income and total household purchasing power, discussed further in the informal economy context of section 3.6, complicates straightforward interpretation of the state's otherwise favourable aggregate per capita income position, and underscores the importance of the district and household level economic analysis this framework has emphasised throughout its opening chapters.

This favourable aggregate per capita income position also warrants a note of methodological caution given Uttarakhand's comparatively small population base, discussed in Chapter 1, since per capita measures are mechanically more sensitive to the influence of a relatively small number of high income households or districts than the equivalent measure would be in a larger, more populous state. The concentration of the state's most economically dynamic activity within Dehradun, Haridwar, and Udham Singh Nagar, discussed throughout this chapter, means that the state average per capita income figure, while a useful headline indicator, should be read alongside the district level and hill-plains disparity analysis presented in Chapter 1 rather than treated as representative of typical household economic circumstances across the state's full geography.

3.3 Primary Sector: Agriculture, Horticulture, Animal Husbandry and Fisheries

Agriculture, while contributing only 10 per cent of Uttarakhand's GSDP, discussed in section 3.1, remains a foundational livelihood sector for a substantial share of the state's population, particularly within its hill districts where subsistence and small-holder cultivation continues to anchor rural household economies alongside the remittance income discussed in section 3.2. Within this agricultural sector, horticulture has emerged as an increasingly significant sub-sector, contributing approximately 35 per cent of the state's agricultural GDP and 14 per cent of overall state GSDP, despite occupying only around 20 per cent of the state's total cultivated area, reflecting the considerably higher per hectare value generated by high value horticultural crops relative to conventional foodgrain cultivation (Agriculture in Uttarakhand, Uttarakhand PCS Notes, 2024).

Uttarakhand's horticultural output spans the state's full elevation gradient, discussed in Chapter 1, from rice, wheat, and sugarcane cultivation in the Terai plains, through apple, pear, peach, and plum orchards in the mid-altitude Himalayan zone, to medicinal plants and small scale horticulture at the highest elevations. Apple production, the state's signature high altitude horticultural crop, reached 43,752 tonnes in 2025, a modest increase from 42,973 tonnes in 2024, though both figures remain considerably below the all-time high of 123,228 tonnes recorded in 2013, with recent output constrained by erratic weather, pest pressure, and ageing orchards across the state's traditional apple growing districts (Production: Horticulture Crops: Fruits: Apple: Uttarakhand, CEIC, 2025; Economy of Uttarakhand, Grokipedia, 2026). Only 7.5 per cent of the state's horticultural produce is currently processed, with the state's Horticulture Mission targeting a doubling of this processing share by 2030 through

expanded cold chain infrastructure and varietal improvement programmes, discussed further in the food processing context of Chapter 18 (Economy of Uttarakhand, Grokipedia, 2026).

The state government announced a dedicated push for floriculture in March 2025, seeking to scale up high value flower farming, including tulip cultivation, and position Uttarakhand's Himalayan climate as a competitive advantage for establishing the state as a major floriculture hub, complemented by technical support and market linkage assistance for growers (Uttarakhand Tourism, Economy, Agriculture, and Industries Insights, IBEF, 2026). The Government of India's GST 2.0 reforms have further supported the state's traditional agricultural produce, reducing the GST rate on Pahari Toor Dal, Uttarakhand Red Rice, and Lakhori Mirchi from 12 to 5 per cent, a change expected to benefit nearly 9,000 farmers and promote sustainable organic farming practices rooted in the traditional Barahnaja multi-crop cultivation system practised across much of hill Uttarakhand (Uttarakhand Tourism, Economy, Agriculture, and Industries Insights, IBEF, 2026).

Animal husbandry in Uttarakhand retains particular cultural and livelihood significance in the state's higher altitude districts, where transhumant pastoral communities including the Van Gujjars discussed in Chapter 1 continue to practise seasonal migration of buffalo and other livestock between winter and summer grazing grounds, a livelihood pattern increasingly constrained by forest protection regulations even as it continues to supply a meaningful share of the state's dairy output. Poultry and small ruminant rearing, typically integrated within mixed hill farming systems alongside the horticultural and foodgrain cultivation discussed above, provide a further important, if statistically under-captured, contribution to rural household income and nutrition security, discussed further in Chapter 6. The state's dairy cooperative infrastructure, while less extensive than in larger agricultural states, has continued to expand its procurement network into the state's more accessible hill districts, offering farmers a more reliable and organised market channel than the informal sale arrangements that have historically characterised much of hill Uttarakhand's dairy economy, discussed further in the agricultural marketing context of Chapter 18.

3.4 Secondary Sector: Industry, Manufacturing and Mining

Uttarakhand's industrial sector has developed substantially around the State Infrastructure and Industrial Development Corporation of Uttarakhand Limited, commonly known as SIDCUL, established in 2002 to promote industrial development and infrastructure across the state, with integrated industrial estates now operating at Haridwar, Pantnagar, Kotdwar, Kashipur, and Sitarganj (State Infrastructure and Industrial Development Corporation of Uttarakhand Limited, Wikipedia, 2025). These industrial estates have attracted more than a thousand expressions of interest entailing investment of approximately Rs 20,000 crore, with manufacturing units concentrated in automotive components, electronics, engineering, pharmaceuticals, and fast moving consumer goods, drawing on the state's proximity to the National Capital Region and the tax incentives available under the state's Himalayan Industrial Policy (State Infrastructure and Industrial Development Corporation of Uttarakhand Limited, Wikipedia, 2025).

Pharmaceutical manufacturing has emerged as a particularly significant industrial specialisation, with the Selaqui industrial area in Dehradun district developing into a major pharmaceutical production cluster, positioning Uttarakhand among India's leading pharmaceutical manufacturing hubs (Expert TM Registration in Uttarakhand, IPR Karo, 2026). Major exported items from the state include engineering goods, drugs and pharmaceuticals, and electronic goods, with foreign direct investment inflows between October 2019 and June 2025 reaching Rs 28,965 crore, or approximately 3.26 billion dollars, according to Department for Promotion of Industry and Internal Trade data (Uttarakhand State Presentation and Economy Growth Report, IBEF, 2026).

The state government's Mega Industrial and Investment Policy of 2025, alongside its dedicated MSME Policy, has set a target of establishing 25,000 new micro, small, and medium enterprises over a five year roadmap, with an associated investment target of Rs 7,500 crore and an employment target of one lakh new jobs, developed in partnership with international consultancy support and explicitly framed around promoting ease of doing business, district level investment infrastructure, and support for investors, particularly in the state's remote and flood affected hill areas (25 Thousand MSME Industries to be Set Up in Uttarakhand, Drishti IAS, 2025). Mining within Uttarakhand remains comparatively limited relative to the state's manufacturing and horticultural sectors, constrained both by the ecological sensitivity of Himalayan terrain, discussed in Chapter 13, and by regulatory restrictions on riverbed and hill mining introduced following recurring landslide and flash flood disasters, discussed in Chapter 14, though limited magnesite, limestone, and soapstone extraction continues in specific districts under regulated conditions.

The state's earlier MSME Policy, notified prior to the current Mega Industrial and Investment Policy, offered incentives including capital investment subsidy, interest subsidy, and value added tax reimbursement, with an explicit objective of ending outward migration from the state's remote and flood hit hill areas by inspiring approximately 1,000 youths annually to become entrepreneurs, an objective directly connected to the hill outmigration challenge documented throughout Chapter 1 (U'khand's First MSME Policy, Business Standard, 2025). This policy also established dedicated mini textile parks in Munsyari in Pithoragarh district and in the Kumaon region, illustrating a deliberate, if modestly scaled, effort to extend industrial policy benefits beyond the SIDCUL corridor's plains focused industrial estates into the state's hill districts specifically. The persistent concentration of Uttarakhand's largest scale manufacturing investment within the Haridwar-Udham Singh Nagar plains belt, notwithstanding these hill focused MSME initiatives, illustrates the continuing structural challenge of translating the state's overall industrial policy success into genuinely distributed economic opportunity across its hill and plains districts alike, a theme this framework returns to throughout its regional development chapters.

3.5 Tertiary Sector: Trade, Finance, Real Estate and Services

Services constitute 43 per cent of Uttarakhand's GSDP, discussed in section 3.1, encompassing tourism, transport, retail trade, financial services, and public administration, with tourism representing the single most economically significant component of this tertiary

sector given the state's status as Devbhoomi, discussed throughout Chapter 1 and examined in full in Chapter 19. The Char Dham Yatra alone generated over Rs 306 crore in revenue within just 48 days of the early phase of its 2025 season, drawing more than 3.3 million pilgrims, while annual statewide pilgrimage tourism revenue is estimated to exceed Rs 7,500 crore, illustrating the substantial scale of the tertiary sector's dependence on religious and heritage tourism (Uttarkashi, Grokipedia, 2026).

Significant recent tertiary sector infrastructure investment includes the Rs 18,520 crore Sharda Corridor Project launched in October 2025, intended to boost tourism, connectivity, and local economic growth in the state's eastern Kumaon region, alongside major ropeway investments including the Rs 985 crore, 13 kilometre Sonprayag-Gaurikund-Kedarnath ropeway and a further Rs 700 crore invested by Empyrean Skyview Projects in ropeway infrastructure serving Mussoorie and Yamunotri (Uttarakhand Tourism, Economy, Agriculture, and Industries Insights, IBEF, 2026). The launch of uttarastays.com, a state sponsored homestay booking portal featuring approximately 5,000 listings, has further extended the tertiary sector's reach into community based tourism, supporting an estimated 80,000 livelihoods and strengthening the linkage between formal tourism infrastructure investment and household level income generation in the state's smaller hill towns and villages (Uttarakhand Tourism, Economy, Agriculture, and Industries Insights, IBEF, 2026).

Financial services and retail trade have expanded alongside this tourism driven growth, particularly within the Dehradun-Haridwar-Rishikesh corridor and the SIDCUL adjacent towns of Haridwar and Rudrapur, discussed in section 3.4, where the concentration of manufacturing employment has generated corresponding demand for banking, insurance, and consumer retail services. Real estate activity has similarly intensified in these same corridors, driven by a combination of industrial employment growth, tourism related hospitality investment, and demand from retirees and second home buyers drawn to Uttarakhand's climate and proximity to Delhi, a dynamic examined further in the urban development context of Chapter 11.

3.6 Informal Economy: Size, Significance and Integration Challenges

The informal economy in Uttarakhand carries a distinctive character shaped by the state's specific combination of hill outmigration, tourism seasonality, and remittance dependence, discussed throughout this chapter and in Chapter 1. A substantial share of the state's rural hill economy operates through informal, subsistence, and semi-commercial arrangements, including small scale horticultural production, informal dairy and livestock rearing, and seasonal tourism related employment in guesthouses, trekking support, and pilgrimage services, none of which are consistently captured within the formal GSDP accounting discussed in section 3.1. Given that agriculture, forestry, and fishing together account for 47.4 per cent of the state's working population despite contributing only 10 per cent of GSDP, discussed in sections 3.1 and 3.3, a very substantial share of Uttarakhand's actual workforce is engaged in activity that generates comparatively low measured value added, a pattern strongly suggestive of extensive informal and underemployed labour within the state's rural economy (Summary Report for the State of Uttarakhand, NITI Aayog, 2025).

Tourism related informal employment carries particular significance in Uttarakhand given the sector's pronounced seasonality, discussed further in Chapter 19, since pilgrimage and trekking season employment in guesthouses, transport, and portering services often does not translate into stable, year round formal employment, leaving a substantial share of the tourism dependent workforce reliant on several months of intensive seasonal income supplemented by informal off-season activity or continued reliance on remittances from family members working elsewhere, discussed in Chapter 1. The state government's uttarastays.com homestay portal, discussed in section 3.5, represents one deliberate policy effort to formalise and extend market access for a segment of this informal tourism economy, though its reach into the state's more remote hill districts, where the majority of genuinely informal tourism activity is likely concentrated, remains a work in progress.

Extending formal social security coverage, discussed in Chapter 7, and access to institutional credit, discussed in Chapter 18, to Uttarakhand's substantial informal workforce, particularly its seasonal tourism workers and small hill farmers, represents an important priority for the state's broader labour market policy, discussed further in section 3.7, since a workforce operating predominantly outside the formal economy remains correspondingly excluded from the employment protections, retirement security, and credit access that formal sector integration would otherwise provide.

The scale of Uttarakhand's informal economy also carries direct implications for the state's own tax revenue base, discussed in the fiscal context of Chapter 2, since income generated through informal, cash based transactions in tourism services, small scale horticulture, and remittance dependent household economies typically falls outside the GST and income tax net that formal sector activity generates, helping to explain the state's comparatively modest own tax revenue to GSDP ratio documented in Chapter 2. Formalisation of even a modest share of this informal economic activity, through continued expansion of digital payment infrastructure, formal tourism registration incentives, and simplified compliance pathways specifically designed for small, seasonal hill enterprises, would generate benefits extending well beyond the direct welfare gains to informal workers themselves, strengthening the state's own revenue base and reducing its continued dependence on central transfers discussed throughout Chapter 2.

3.7 Labour Market: Employment, Unemployment and Workforce Quality

Uttarakhand's labour market presents a genuinely mixed and, in the most recent data, increasingly concerning picture. The state's annual unemployment rate decelerated to 4.5 per cent as of 2022-23, though this figure has remained above the national estimate consistently since 2017-18, indicating a persistent, structural rather than cyclical unemployment gap relative to the rest of India (Summary Report for the State of Uttarakhand, NITI Aayog, 2025). The Periodic Labour Force Survey for 2023-24 recorded genuine improvement, with overall unemployment declining further from 4.5 to 4.3 per cent, and youth unemployment in the 15 to 29 age group falling sharply from 14.2 to 9.8 per cent, alongside a rising worker population ratio across all age groups, with the ratio for the 15 to 29 cohort rising from 27.5 to 44.2 per cent (Uttarakhand Leads in Employment Growth, Drishti IAS, 2026).

This encouraging trajectory has not, however, been sustained into the most recent available data. Periodic Labour Force Survey figures for 2025 place Uttarakhand, alongside Arunachal Pradesh and Punjab, among the Indian states recording unemployment rates above 6 per cent, a marked reversal from the improving trend documented in the 2023-24 survey round, with the underlying analysis attributing this pattern to tourism dependence, skill mismatches, and uneven industrial growth across the state's labour market (India's Unemployment Rate in 2026, India Macro Indicators, 2026). This apparent reversal, occurring against the backdrop of the state's continued strong nominal GSDP growth discussed in section 3.1, suggests that Uttarakhand's recent economic expansion has not been generating employment at a pace commensurate with its output growth, a disconnect that merits close monitoring by the state's Employment and Skilling Department.

The Female Labour Force Participation Rate in Uttarakhand improved to a level close to the national average as of 2022-23, a genuinely positive development given the historical gender gaps in workforce participation documented across much of hill India, though the working population's continued heavy concentration in agriculture, forestry, and fishing at 47.4 per cent, services at 31.4 per cent, and construction and manufacturing combined at 20.3 per cent, discussed in section 3.6, indicates that a considerable share of this female labour force participation likely occurs within the state's lower productivity agricultural sector rather than in higher value formal employment (Summary Report for the State of Uttarakhand, NITI Aayog, 2025). The state's newly established Chief Minister's Hub and Single Point of Contact model for employability, announced in the 2026-27 budget and discussed in Chapter 2, represents a direct policy response to these labour market quality concerns, though its effectiveness in reversing the recent unemployment uptick and improving the qualitative composition of the state's workforce remains to be demonstrated.

The specific finding that Uttarakhand's rising unemployment coincides with tourism dependence and skill mismatches, discussed above, points toward a structural rather than purely cyclical explanation for the state's labour market challenges. A workforce trained substantially for conventional agricultural, tourism service, and government employment may be poorly matched to the skill requirements of the SIDCUL corridor's expanding pharmaceutical, electronics, and automotive manufacturing base, discussed in section 3.4, creating a paradoxical situation in which industrial employers report difficulty filling specialised technical positions even as the state's overall unemployment rate rises. Addressing this mismatch requires closer alignment between the state's technical and vocational education infrastructure, discussed in Chapter 5, and the specific skill demands of its growth corridors, discussed in section 3.9, rather than continued reliance on generic employment guarantee or placement programmes that do not address the underlying qualification gap. The seasonal nature of the state's substantial tourism employment, discussed in section 3.6, further complicates conventional unemployment measurement, since workers employed intensively during the peak Char Dham Yatra season may register as unemployed during the winter off-season despite deriving the majority of their annual income from tourism related work, a measurement nuance the state's labour statistics infrastructure, discussed further in Chapter 20, would benefit from capturing more precisely.

3.8 Inflation, Price Stability and Consumer Welfare

Price stability in Uttarakhand is shaped by the state's distinctive combination of tourism driven seasonal demand surges, discussed in section 3.5, and its dependence on plains sourced food and consumer goods for much of its hill population, given the limited agricultural surplus generated within the state's own mountainous terrain relative to its total consumption needs. This combination creates a price environment in which consumer costs in the state's hill towns, particularly during peak pilgrimage and tourist seasons, can rise considerably above both the state's own off-season baseline and comparable price levels in the state's plains districts, a seasonal price volatility pattern not experienced at comparable intensity by most non-tourism dependent Indian states.

The Government of India's GST 2.0 reforms, discussed in section 3.3, which reduced the tax rate on key hill agricultural produce including Pahari Toor Dal, Uttarakhand Red Rice, and Lakhori Mirchi from 12 to 5 per cent, carry direct relevance for consumer welfare within the state, both by reducing the effective cost of these staple hill food items for consumers and by improving farmgate price realisation for the nearly 9,000 farmers the reform is expected to benefit, discussed in section 3.3 (Uttarakhand Tourism, Economy, Agriculture, and Industries Insights, IBEF, 2026). Given the horticultural sector's comparatively low processing rate of just 7.5 per cent, discussed in section 3.3, and the resulting post-harvest wastage this implies, expanding cold chain and food processing infrastructure represents an additional, indirect but meaningful lever for improving consumer price stability for fruit and vegetable products within the state, since reduced post-harvest loss typically translates into more stable and moderate consumer pricing over the agricultural season.

Household purchasing power and consumer welfare across Uttarakhand's hill districts, discussed in the context of remittance dependence in sections 3.2 and 3.6, remain particularly sensitive to price fluctuations in essential goods given the comparatively modest and, in many households, seasonally variable cash income these districts generate locally. Continued expansion of the state's Public Distribution System and targeted food subsidy programmes, examined further in the social welfare context of Chapter 7, remains an important complement to the broader price stability measures discussed throughout this section, particularly for hill households whose local agricultural production alone is insufficient to meet household food needs across the full calendar year.

3.9 Growth Corridors: Engines of Economic Expansion

The SIDCUL industrial belt spanning Haridwar, Pantnagar, Kashipur, Sitarganj, and Kotdwar, discussed in section 3.4, constitutes Uttarakhand's principal industrial growth corridor, benefiting from proximity to the National Capital Region and integrated infrastructure specifically designed to attract automotive, pharmaceutical, electronics, and fast moving consumer goods manufacturing (State Infrastructure and Industrial Development Corporation of Uttarakhand Limited, Wikipedia, 2025). This corridor's continued expansion, reflected in the more than Rs 20,000 crore in cumulative investment interest discussed in section 3.4, positions the Haridwar-Udham Singh Nagar plains belt as the clear anchor of the

state's manufacturing led economic growth, a concentration that reinforces the hill-plains disparity themes discussed throughout Chapter 1.

A second, increasingly significant growth corridor is emerging around the state's pilgrimage and tourism infrastructure investment, anchored by the Rs 18,520 crore Sharda Corridor Project in the Kumaon region, discussed in section 3.5, and the network of ropeway projects connecting Sonprayag-Gaurikund-Kedarnath, Mussoorie, and Yamunotri, together representing a deliberate state strategy to extend the economic benefits of religious and heritage tourism beyond the traditionally dominant Char Dham circuit of Garhwal into a more geographically distributed tourism growth corridor spanning both of the state's administrative divisions, discussed in Chapter 1 (Uttarakhand Tourism, Economy, Agriculture, and Industries Insights, IBEF, 2026). The Manaskhand Mandir Mala Mission, discussed in Chapter 2, forms an integral part of this second growth corridor strategy, explicitly designed to replicate the Char Dham circuit's tourism success within the Kumaon region's own network of temple sites.

A third, more nascent growth corridor is beginning to emerge around the state's wellness and Ayush sector, anchored by Rishikesh's established global reputation as a yoga and meditation destination and formalised through the state's dedicated Uttarakhand Yoga Policy of 2025, which seeks to position the state as a global capital for wellness tourism, encompassing yoga centres, meditation retreats, and Ayurvedic practice (Expert TM Registration in Uttarakhand, IPR Karo, 2026). This wellness corridor overlaps geographically and thematically with the state's horticultural emphasis on medicinal and aromatic plants, discussed in section 3.3 and promoted through the central government's AYUSH ministry, suggesting a potentially valuable opportunity for the state to develop an integrated wellness value chain spanning medicinal plant cultivation, Ayurvedic product manufacturing, and wellness tourism services, rather than treating these as separate, unconnected sectoral initiatives. Realising this integration would require closer coordination between the state's Horticulture, Ayush, and Tourism departments than has historically characterised Uttarakhand's sectoral policy architecture, a coordination challenge this framework returns to in the discussion of administrative governance reform in Chapter 15.

Connectivity infrastructure, discussed in detail in Chapter 8, increasingly functions as the connective tissue linking these growth corridors, with the Rishikesh-Karnaprayag Rail Project, the Tanakpur-Dehradun weekly express train service inaugurated to improve connectivity for devotees visiting Maa Purnagiri, and continued heliport expansion under the UDAN scheme, discussed in Chapter 2, together intended to reduce the substantial travel time and accessibility barriers that Uttarakhand's mountainous terrain has historically imposed on both industrial logistics and pilgrimage tourism (Uttarakhand State Presentation and Economy Growth Report, IBEF, 2026). Taken together, these growth corridors, the established SIDCUL manufacturing belt, the expanding dual circuit pilgrimage and heritage tourism network spanning Garhwal and Kumaon, and the emerging wellness and Ayush value chain centred on Rishikesh, describe an economy in genuine, multi-directional transition rather than one dependent on any single dominant growth engine, forming an important

structural backdrop to the investment climate and industrial policy analysis that follows in Chapter 4.

Chapter 4: Investment, Industry and Private Sector Development

Uttarakhand enters its third development decade as a small, hill-majority state that has staked much of its economic identity on becoming a manufacturing and investment destination within striking distance of the National Capital Region. The state's industrial story since its 2000 formation has been shaped by two forces working in tension: a central excise and tax incentive package that pulled large FMCG and pharmaceutical manufacturers into its plains districts in the 2000s, and a persistent structural gap between the industrially dense Terai belt of Udham Singh Nagar and Haridwar and the thinly industrialised hill districts that make up most of the state's geographical area. This chapter examines the state's investment climate, its industrial and MSME policy architecture, its anchor industries, its approach to zones and corridors, its record on foreign direct investment, the performance of its public sector undertakings, its public-private partnership pipeline, and the cross-border and inter-state cooperation that increasingly shapes its development choices.

4.1 Investment Climate Assessment and Ease of Doing Business

Uttarakhand's investment climate is best understood through two lenses that do not always agree: the state's own promotional narrative of accelerating investor confidence, and the more cautious picture that emerges from independent verification of what that investment actually consists of.

On formal reform metrics, Uttarakhand has performed respectably. Under the Department for Promotion of Industry and Internal Trade's Business Reform Action Plan (BRAP) 2020 assessment, states were grouped into four categories, and Uttarakhand was placed in the "Achievers" category alongside Himachal Pradesh, Madhya Pradesh, Maharashtra, Odisha and Uttar Pradesh, one tier below the "Top Achievers" group led by Andhra Pradesh, Gujarat, Haryana, Karnataka, Punjab, Tamil Nadu and Telangana (Department for Promotion of Industry and Internal Trade, 2020). The state has also highlighted that, in NITI Aayog's Export Preparedness Index, it ranked first among the Himalayan states and ninth nationally, alongside noting that it sits in the Achievers category on Ease of Doing Business (Tribune News Service, 2023).

The centrepiece of the state's investment promotion effort was the Uttarakhand Global Investors Summit, held on 8 and 9 December 2023 in Dehradun under the theme "Peace to Prosperity" and inaugurated by Prime Minister Narendra Modi, who described the state as a new investment hub built on the "double engine" model of state and central government cooperation (India TV News, 2023). By the close of the summit, the government reported 1,779 memoranda of understanding worth approximately Rs 3.56 lakh crore, achieved through an extensive roadshow campaign across London, Dubai, and several Indian metros that an RTI response later put at a cost of roughly Rs 100 crore to the state exchequer (Kumar, 2026). Roughly eighteen months later, at the Uttarakhand Nivesh Utsav held in Rudrapur in July 2025, Union Home Minister Amit Shah announced that investments worth over Rs 1 lakh crore from those MoUs had materialised, creating over 81,000 jobs, with

indirect employment projected to reach 2.5 lakh within two years (Square Foot Investor, 2025).

This headline figure, however, has been subject to significant independent scrutiny. An investigative report published in July 2026 examined the Directorate of Industries' list of roughly 3,300 "grounded" entities behind the Rs 1 lakh crore figure and found that a notification issued on 1 December 2023, days before the summit, had relaxed the definition of "grounded investment" so that a project needed only two of several loosely defined criteria, such as land allotment or licence approval, rather than verified capital deployment, to qualify (Kumar, 2026). The same investigation found that the list included more than three dozen small flour mills and hundreds of fertiliser, seed and small clinic outlets, several of whose owners said they had no knowledge their businesses had been counted as summit investors, and that a special-needs school built entirely from corporate social responsibility funds and donations had been recorded as a Rs 24.49 crore investor. Of the top ten grounded investments by value, eight were tied to state-owned or joint-venture power utilities, one listed investor with a claimed Rs 1,200 crore commitment showed zero revenue and no employees on record for the preceding four financial years, and another inspected site was found shuttered with only security guards present. A senior Directorate of Industries official defended the inclusion of small businesses and public sector projects on the grounds that they still represent employment generation and capital deployment within the state, even where the capital did not originate from an external investor in the ordinary sense of the term (Kumar, 2026).

Taken together, these two strands suggest a more textured reading of Uttarakhand's investment climate than either the summit press releases or the critical reporting alone would offer. The state's underlying reform record on measurable regulatory dimensions, single window clearance, labour peace, and a crime rate the government describes as 22 percent below the national average, appears genuinely comparatively strong for a small hill state (Tribune News Service, 2022). At the same time, the scale and composition of its flagship investment claims warrant caution, and future editions of this framework should track a verified, PSU-adjusted investment figure separately from the headline MoU-to-grounding pipeline the state currently publicises.

Two structural factors continue to shape investor decision-making beneath the level of headline policy announcements. The first is terrain-driven cost: land assembly in hill districts is slower and costlier per usable hectare than in the Terai plains, since buildable land is fragmented across terraced slopes and subject to stricter forest and environmental clearance requirements, a reality that explains much of the plains-hill investment gap discussed further in section 4.3. The second is labour market thinness in the hill districts themselves, where a smaller resident working-age population and continuing outward migration mean that even investors willing to locate in Category A or B districts under the MSME Policy 2023 must budget for higher recruitment and retention costs than in Udham Singh Nagar or Haridwar. Addressing these two constraints directly, rather than through subsidy rates alone, is likely to

matter more for future investment climate outcomes than further additions to the incentive schedule.

4.2 Industrial Policy Framework and MSME Development

Uttarakhand's industrial policy architecture has evolved into a layered system of a base MSME policy, a large-enterprise mega policy, and a set of sector-specific overlays, all administered through a common single window portal under the Directorate of Industries and the State Infrastructure and Industrial Development Corporation of Uttarakhand Limited (SIIDCUL).

The Uttarakhand MSME Policy 2023 forms the foundation of this architecture. It reorganised the state's earlier five-category district classification into four categories, with A and B covering hill districts and C and D covering most plains areas, and set capital subsidy at up to 50 percent for investment up to Rs 1 crore in Category A, with tapering additional subsidy on larger tranches, while Category B, C and D districts received progressively lower subsidy rates of 40, 30 and 20 percent respectively for comparable investment (Drishti IAS, 2023). The policy's stated objectives include fostering entrepreneurship among youth and women, improving access to finance and skilled labour, encouraging environmentally sustainable industrial development, and attracting investment to underdeveloped and hilly districts (Cretum Advisory, n.d.).

For large-scale manufacturing, the state cabinet under Chief Minister Pushkar Singh Dhami approved the Uttarakhand Mega Industrial and Investment Policy 2025 in May 2025, consolidating and superseding the capital-input provisions of the earlier 2021 mega policy. The policy is designed to establish Uttarakhand as a competitive destination for capital investment at the national and international level, and it took effect immediately, remaining in force for five years (Drishti IAS, 2025). Eligible large enterprises are classified into four categories based on fixed capital investment and minimum employment thresholds, and applicants apply through a Common Application Form on the Single Window Portal, with a window of three to seven years to complete the investment. Financial incentives include a capital subsidy of up to 20 percent, a stamp duty reimbursement, and a separate "Hill Incentive" for units in classified hill areas (TaxGuru, 2025). The stamp duty reimbursement is set at 50 percent up to a ceiling of Rs 50 lakh on land purchase or lease deeds (PR Wire India, 2025). To guard against incentive arbitrage, the policy requires that fixed capital investment be in new plant and machinery, excluding units built around machinery transferred from another unit or displaced from elsewhere, and conditions eligibility on at least 70 percent permanent employment for state residents.

This general architecture is supplemented by several sector-specific policies. The Uttarakhand Aerospace and Defence Industrial Policy offers a full electricity duty exemption for the first five years of commercial production and a stamp duty concession, along with a 30 percent concession or reimbursement on SIIDCUL land cost, for notified aerospace and defence parks and clusters (Invest India, 2020). A predecessor MSME policy already supported two mini textile parks, at Munsiyari in Pithoragarh district and Bhimtal in Chamoli

district, an approach continued under the Mega Textile Park Policy framework (India Mart, 2015). The Industries Department's broader policy catalogue also includes a Private Industrial Park Policy 2023, a Startup Policy 2023, and an Uttarakhand Logistics Policy 2023 (SIIDCUL, n.d.).

The state's Startup Policy, revised in 2023 around a "Startup Uttarakhand Vision 2025," tightened eligibility for startups relocating from outside the state, raising the required share of Uttarakhand-domiciled full-time employees from 50 to 70 percent, while retaining a broad incentive basket of monthly and marketing allowances, patent reimbursement, and stamp duty and state GST reimbursement (PwC, 2023). The policy appears to be delivering measurable results: Uttarakhand was recognised as a "Leader" in the fifth edition of DPIIT's States' Startup Ecosystem Ranking, and the number of DPIIT-recognised startups originating in the state rose from 87 in 2019 to 271 in 2023, according to figures the Ministry of Commerce and Industry placed before the Rajya Sabha in February 2024 (Outlook India, 2026; Ministry of Commerce and Industry, 2024). Taken as a whole, the policy framework is comprehensive on paper, but its very layering, MSME policy, mega policy, aerospace policy, textile policy, logistics policy, and startup policy all running in parallel, places a premium on the coordinating capacity of the Directorate of Industries and its single window system to prevent overlapping claims and administrative delay. An investor whose project spans, for instance, an aerospace component unit located in a notified hill cluster would in principle need to reconcile eligibility under the Aerospace and Defence Industrial Policy, the hill incentive under the Mega Policy 2025, and the skill development provisions of the MSME Policy 2023 simultaneously, a task that depends heavily on the Common Application Form processing capacity of the Single Window Portal rather than on any single policy document read in isolation. Strengthening that back-end processing capacity, including staffing and digitisation of the portal itself, is therefore as material to effective policy delivery as the design of the incentive slabs.

4.3 Large and Anchor Industries: Sectoral Analysis

Uttarakhand's large-industry base is concentrated overwhelmingly in two plains districts, Udham Singh Nagar and Haridwar, a pattern that reflects both historical fiscal incentives and the practical logistics of serving the National Capital Region market.

The Pantnagar-Rudrapur cluster in Udham Singh Nagar, developed as an Integrated Industrial Estate under the state's industrial development corporation, has become the state's automotive and heavy engineering anchor. Tata Motors operates an integrated plant there producing Ace and Intra mini-trucks, comprising weld shops, paint shops, an engine and gearbox shop, assembly lines and an integrated vendor park occupying 361 acres with over 60 vendors, on a site spread across 591 acres, employing around 4,000 direct staff plus over 2,000 contractual workers and over 8,000 through the vendor park (Cardekho Trucks, 2020). Bajaj Auto and Ashok Leyland also maintain a significant presence in the same estate, together making Pantnagar one of northern India's denser automotive manufacturing clusters outside the traditional National Capital Region and Chennai belts (Hendo Industries, 2026).

The Haridwar SIDCUL estate anchors the state's fast-moving consumer goods and pharmaceutical manufacturing base, hosting Hindustan Unilever, Patanjali Ayurved, Dabur, Emami and Herbal Life among dozens of other FMCG and pharmaceutical manufacturers (Hendo Industries, 2026), a concentration that traces back substantially to a central fiscal incentive package for newly formed Himalayan states introduced in the early 2000s, which offered excise and income tax holidays that made Uttarakhand and Himachal Pradesh attractive low-cost manufacturing bases for branded consumer goods. Company directories for the estate additionally list Nestle India, Parle Biscuits, Reckitt Benckiser and Britannia Industries among resident manufacturers (SIDCUL Industries, n.d.). Adjoining this base, the Selaqui "Pharma City" near Dehradun, together with the Haridwar and Roorkee pharmaceutical belt, hosts over 300 pharmaceutical manufacturing units, including Bajaj Formulations, Axa Parenterals, Akums Drugs and Pharma, and Windlas Biotech (Pharma Choices, 2026), positioning the state as one of India's notable formulation manufacturing hubs alongside Himachal Pradesh.

Beyond these two anchors, SIIDCUL's remaining integrated industrial estates at Sitarganj, Kotdwar and Kashipur, along with Bhimtal and the IT Park in Dehradun, host a lighter mix of engineering, food processing, and a still-nascent information technology presence. Sitarganj in particular has attracted food and consumer product units, extending the Haridwar FMCG cluster's supply chain eastward along the Terai belt, while the Dehradun IT Park has drawn a small but growing set of software and cybersecurity employers, reflecting Dehradun's appeal as a liveable, mid-sized city rather than a purpose-built technology hub on the scale of Bengaluru or Hyderabad. The concentration of large industry in just two of thirteen districts means that despite more than two decades of hill-specific subsidy design under successive MSME and mega policies, the industrial base of the hill districts, which together account for the majority of the state's land area and a substantial share of its population, remains comparatively thin, a structural imbalance that the Mega Policy 2025's hill incentive and the MSME policy's Category A and B subsidy slabs are explicitly designed to address but have not yet visibly reversed.

4.4 Special Economic Zones, Industrial Corridors and Clusters

Uttarakhand occupies an unusual position among Indian states in that it does not appear among the states with approved, notified or operational Special Economic Zones under the central SEZ Act, 2005, in the most recent published state-wise SEZ tables, in contrast to a neighbouring state such as Uttar Pradesh, which had 24 approved and 14 operational zones by the same reckoning (Wikipedia, n.d.). This is less a policy oversight than a reflection of the mismatch between the SEZ model, built around export-oriented, customs-bonded enclaves best suited to coastal or metro-adjacent locations, and Uttarakhand's landlocked, hill-heavy geography.

In practice, the state's industrial clustering has been delivered instead through SIIDCUL's seven integrated industrial estates at Pantnagar, Haridwar, Dehradun, Selaqui, Kotdwar, Sitarganj and Kashipur, which function as the state's de facto industrial corridors. These

estates provide plotted, serviced industrial land and shared utilities rather than the duty-free enclave status of an SEZ, and they remain the primary vehicle through which the Mega Policy 2025 and MSME Policy 2023 incentives are physically delivered to investors.

Physical connectivity is being reinforced through several corridor investments. The Delhi-Dehradun Expressway is shortening travel time between the state's western industrial belt and the National Capital Region, improving the logistics case for locating consumer goods and light engineering units in Haridwar and Dehradun district. The Char Dham All-Weather Road project, while primarily a pilgrimage and tourism connectivity investment, is improving year-round access to hill towns that host smaller industrial estates, and the Rishikesh-Karnaprayag rail line is extending broad-gauge rail into the hill region for the first time, a development with longer-term implications for hill-district logistics costs that current industrial policy documents have only begun to address explicitly.

A further development bears watching. As part of a shift away from the SEZ Act toward a new industrial-cities approach, industrial cities are planned for development in Telangana, Andhra Pradesh, Bihar, Uttar Pradesh, Punjab, Uttarakhand and Kerala, modelled on precedents such as the integrated industrial township at Greater Noida (Policy Circle, 2024). Should this materialise, it would represent Uttarakhand's first meaningful participation in a national zone-style industrial infrastructure programme, and its planning should be closely coordinated with the state's existing SIIDCUL estates and the Mega Policy 2025 incentive structure to avoid duplicative or competing land banks.

Freight and logistics costs remain a persistent constraint across all of these corridors. The absence of a coastal port or major inland waterway, discussed further in Chapter 8.4, means that export-oriented units in Uttarakhand typically route containerised cargo through dry ports and inland container depots in the National Capital Region, adding a layer of road-transport cost and time that coastal-state competitors do not bear. The state's 2023 Logistics Policy is intended to partly offset this through freight subsidy and warehousing support, but its impact will depend on complementary progress in last-mile road quality between the SIIDCUL estates and the nearest rail and dry-port linkages, an issue examined further in Chapter 8.6.

4.5 Foreign Direct Investment: Inflows, Sectoral Distribution and Policy

Uttarakhand's standalone share of India's recorded foreign direct investment remains modest, and the state does not typically appear among the top state destinations in DPIIT's periodic FDI factsheets, which continue to be dominated by Maharashtra, Karnataka, Delhi and Gujarat. In the most recent full-year data available, Karnataka overtook Maharashtra as the leading state destination, attracting roughly Rs 50,107 crore in FY 2024-25, with Maharashtra and Karnataka together accounting for 51 percent of India's total FDI inflows that year (Athrady, 2025), illustrating how concentrated India's FDI remains in a small number of metro-anchored or coastal states. Historical compilations citing Reserve Bank of India data put Uttarakhand's cumulative FDI inflow between April 2000 and October 2009 at approximately USD 46.7 million (Wikipedia, n.d.), a figure that, while dated, is indicative of

the state's comparatively limited independent track record in attracting recorded foreign equity relative to the scale of its industrial base.

Much of the state's recent foreign investment engagement has instead taken the form of memoranda of understanding rather than realised equity inflows. At the December 2023 Global Investors Summit, a Netherlands business delegation led by the India-Dutch Financial Corridor signed ten MoUs with the state government spanning aviation maintenance, repair and overhaul, smart mobility, infrastructure, water, food and agriculture, and sports and tourism (ETV Bharat, 2024). These followed roadshows Chief Minister Dharami conducted in London and Dubai, and in several Indian metros, in the run-up to the summit (Kumar, 2026).

On policy design, the state does not operate a dedicated foreign investment desk separate from its domestic investment promotion machinery. The Mega Industrial and Investment Policy 2025's incentive basket, capital subsidy, stamp duty reimbursement, and the hill incentive, applies on an origin-neutral basis to domestic and foreign-invested large manufacturing units alike, and both routes are processed through the same Single Window Portal. Qualitatively, the sectors most frequently referenced in the state's investment promotion material, and in its MoU portfolio, are pharmaceutical and active pharmaceutical ingredient manufacturing, automotive components, renewable energy including small hydropower and solar, and tourism-linked hospitality infrastructure, though the extent to which these MoUs have converted into DPIIT-recorded equity FDI could not be independently verified in state-wise FDI factsheet data available at the time of writing. Strengthening the disaggregation of Uttarakhand-specific FDI equity data within DPIIT's periodic factsheets, so that future editions of this development framework can track realised inflows rather than MoU value alone, is flagged here as a priority item for the statistical strengthening agenda taken up in Chapter 20.6.

4.6 Public Sector Undertakings: Performance and Reform Agenda

Uttarakhand inherited a portion of undivided Uttar Pradesh's public enterprise structure at its formation in 2000 and has since built out a state PSU landscape. The state has 40 state public sector undertakings, 7 directorates, and 8 commissions (Wikipedia, n.d.), spanning power, tourism development, water supply, forestry, transport and industrial infrastructure. The sector's financial performance, however, has drawn sustained comment from the Comptroller and Auditor General. The CAG's audit found that the total turnover of 14 State Public Sector Enterprises decreased by 4.17 percent during 2021-22 as compared to 2019-20, and that the contribution of these enterprises to GSDP remained marginal; none of the statutory corporations audited by the CAG had prepared and submitted their accounts for 2021-22 by 30 September 2022, with twelve of these accounts in arrears for between one and six years (Comptroller and Auditor General of India, 2025).

The power sector accounts for the bulk of PSU asset value and public attention. Uttarakhand Power Corporation Limited is the sole distributor of power in the state and manages its roughly 2,600 megawatts of daily demand (Wikipedia, n.d.), while the Power Transmission Corporation of Uttarakhand Limited was created in 2004 to handle the transmission business

separated from UPCL following the Electricity Act 2003 (PTCUL, n.d.). Uttarakhand Jal Vidyut Nigam Limited is the state's principal hydropower generation company, frequently operating in joint venture with the centrally owned THDC India Limited on run-of-river hydropower schemes. Beyond power, Garhwal Mandal Vikas Nigam and Kumaon Mandal Vikas Nigam manage tourism infrastructure and hospitality assets across the state's two administrative divisions, and SIIDCUL manages industrial estate development.

A particularly consequential finding concerns the role of PSUs in the state's post-summit investment accounting discussed in section 4.1. Of the ten largest entries on the Directorate of Industries' "grounded investment" list following the 2023 summit, eight were tied to public sector projects, three linked to UJVNL alone and four more to a UJVNL-THDCIL joint venture, together accounting for roughly Rs 35,279 crore, or about 35 percent, of the state's headline Rs 1 lakh crore grounded investment figure (Kumar, 2026). A UJVNL official explained that such projects are typically assigned by the state government itself, part-funded by government contribution of up to 30 percent of project cost, with the resulting power then purchased back by the state, a structure a former Union finance secretary characterised as fundamentally different from the external private capital an investor summit is ordinarily meant to attract (Kumar, 2026). The Directorate of Industries has defended the practice on the grounds that PSU-linked projects still generate genuine employment and bring capital into the state, whatever their funding origin.

Looking ahead, the reform agenda for Uttarakhand's PSU sector should prioritise three things: clearing the chronic backlog in statutory corporation accounts flagged by successive CAG reports, a precondition for any credible assessment of PSU financial health; a more transparent separation, in the state's own investment reporting, between government capital expenditure routed through PSUs and externally sourced private or foreign investment; and a selective review of the smaller, loss-making or dormant companies within the roughly 40-entity PSU portfolio for possible restructuring, merger or closure, an exercise several other states have undertaken as part of broader public expenditure reform. A fourth, less discussed priority is capacity-building within the finance and accounts cadres of the smaller statutory corporations themselves, since much of the accounts backlog identified by the CAG appears to stem as much from staffing and systems gaps as from any deliberate withholding of information.

4.7 Public-Private Partnership Framework and Pipeline

Uttarakhand's public-private partnership experience is concentrated overwhelmingly in tourism and pilgrimage connectivity rather than industrial estate development, and its single largest current PPP commitment is the Parvatmala ropeway programme. In March 2025, the Union Cabinet Committee on Economic Affairs approved two ropeway projects connecting Govindghat to Hemkund Sahib Ji and Sonprayag to Kedarnath, to be built under the Design, Build, Finance, Operate and Transfer mode of public-private partnership, with the

Govindghat-Hemkund Sahib project costed at Rs 2,730.13 crore (Utkarsh, 2025). The two ropeways together are valued at Rs 68.11 billion, or about Rs 6,811 crore, and foundation stones for both were laid by the Prime Minister in October 2022 ahead of formal Cabinet approval (Gulf News, 2025). Adani Enterprises subsequently received the Letter of Award for the Kedarnath ropeway concession (Adani Enterprises, n.d.). Once operational, these ropeways are expected to replace a gruelling multi-day trek with a journey of a few hours, substantially increasing safe pilgrim-carrying capacity to two of the state's most visited Himalayan shrines.

Beyond ropeways, most of the state's other large physical infrastructure has proceeded through conventional engineering-procurement-construction or fully public-funded routes rather than PPP concessions. The Char Dham All-Weather Road project and the Rishikesh-Karnaprayag broad-gauge rail line, both discussed further in Chapter 8, have been delivered largely outside the PPP framework, reflecting the practical difficulty of structuring bankable, user-fee-based concessions across low-traffic, geologically unstable hill corridors where private concessionaires would otherwise bear disproportionate construction and demand risk. Some infrastructure the state government has publicly associated with its investment narrative, such as SIIDCUL's own roughly Rs 2,000 crore Golf City project in Haridwar, is in fact state-enterprise-led development rather than a concession let to an external private partner, a distinction that matters for accurately classifying the state's PPP pipeline as opposed to its direct public investment (Kumar, 2026).

Institutionally, Uttarakhand does not operate a distinct state PPP policy or dedicated PPP cell comparable to those found in larger states; ropeway and highway PPPs proceed under central government model concession agreements administered through the Ministry of Road Transport and Highways' Parvatmala programme, while smaller municipal-level operation and maintenance contracts with private operators are negotiated on an ad hoc basis by individual departments. Looking forward, the state's PPP pipeline is likely to expand along two lines: further ropeway proposals for other high-footfall pilgrimage circuits under Parvatmala, and, more speculatively, PPP structuring for urban mass transit proposals under consideration for Dehradun and Haridwar, discussed further in Chapter 8.5.

4.8 Regional cooperation: Shared region and growth

Uttarakhand's investment and industrial strategy cannot be planned without reference to two forms of regional interdependence that sit outside the state's unilateral control: its international border with Nepal, and its position as an upstream, headwater state for river systems on which several downstream Indian states depend.

Uttarakhand's international border with Nepal runs approximately 275 kilometres, the shortest among the four Indian states bordering Nepal, and is defined substantially by the Mahakali river, known within India as the Sharda (Springer Nature, 2026). This stretch is governed by the 1996 Mahakali Treaty, which incorporates the 1920 agreement on the Sharda Barrage and envisages the jointly proposed Pancheshwar multipurpose hydropower project on the Mahakali river, alongside earlier Kosi and Gandak agreements covering other stretches

of the India-Nepal border (Bagale, 2019, as cited in Jvs-nwp.org.np, n.d.). Implementation of the Pancheshwar project has been repeatedly delayed by unresolved differences between the two governments over cost-sharing, power allocation and design. A further scheme discussed under India's interlinking-of-rivers programme envisages a link between the Yamuna and Sharda rivers, bringing surplus water from the Indo-Nepal border basin into the Yamuna via Uttarakhand and Uttar Pradesh, intended to benefit the Upper Yamuna basin states of Himachal Pradesh, Uttarakhand, Delhi, Haryana, Rajasthan and Uttar Pradesh (Sharma, n.d.).

Beyond river diplomacy, Uttarakhand has been an active participant in the informal coalition of Himalayan states pressing the Union government for differentiated fiscal treatment. In July 2019, the state hosted a one-day conclave of ten Himalayan states in Mussoorie, at which representatives unanimously called for a dedicated central ministry for Himalayan affairs and for a "green bonus" to be granted for the ecological services these states provide (Swarajya, 2019). Uttarakhand has continued to press this case in subsequent NITI Aayog Governing Council meetings. At the 2023 meeting, the state's chief minister cited an IIFM Bhopal study valuing the minimum monetary worth of Uttarakhand's forest-based ecosystem services at roughly Rs 95,000 crore per year, and noted that pilgrims and tourists visiting during the Char Dham and Kanwar Yatra seasons swell the state's effective service population to five to six times its resident population (Hindustan Times, 2023). A further memorandum making the green bonus case for Himalayan states including Uttarakhand, Sikkim and Jammu and Kashmir was submitted to the Sixteenth Finance Commission in November 2025 (Outlook India, 2026).

More broadly, NITI Aayog's Indian Himalayan Region programme, spanning thirteen mountain states and union territories, has engaged Uttarakhand in cross-state technical cooperation on themes such as spring-shed revival and sustainable mountain development (NITI Aayog, n.d.), work that connects directly to the state's climate vulnerability and disaster risk agenda addressed in Chapter 14. Taken together, these river-basin and Himalayan-coalition dimensions mean that Uttarakhand's industrial and investment planning operates within boundary conditions, water-sharing obligations, cross-border hydropower cooperation with Nepal, and a collective fiscal case advanced jointly with other Himalayan states, that the Vision 2047 roadmap in Chapter 21 will need to treat as structural constraints and opportunities rather than peripheral concerns.

CHAPTER 5: EDUCATION, ACCESS, QUALITY AND FUTURE READINESS

5.1 Elementary Education: Enrolment, Retention, Dropout and Learning Outcomes

Uttarakhand's elementary education system operates within a national context of steadily declining, though still meaningful, dropout rates, with the Economic Survey 2024-25 recording national primary level dropout at 1.9 per cent, upper primary at 5.2 per cent, and secondary at 14.1 per cent (Economic Survey 2024-25, Careers360, 2025). Within this broader national trajectory, the Ministry of Education's Unified District Information System for Education Plus 2025-26 and Performance Grading Index 2.0 reports, released in mid-2026, identified Uttarakhand as one of only four states or union territories, alongside Madhya Pradesh, Manipur, and Odisha, to record a decline in its Performance Grading Index score compared to the previous year, a finding that stands in some tension with the state's otherwise strong composite development trajectory documented in the SDG India Index discussed in Chapter 1 (School Dropout Rate: UDISE+ 2025-26 and Performance Grading Index 2.0, Ensure IAS, 2026).

This Performance Grading Index decline carries particular significance because the Index is specifically designed to track school access, student retention, teacher availability, and infrastructure quality, precisely the foundational elementary education indicators that determine whether children remain enrolled and progress through the schooling system at all, discussed further in the reform priorities identified in section 5.8. The broader national UDISE+ findings for 2025-26 indicate steady improvement in Pupil-Teacher Ratios, digital infrastructure, and school accessibility nationally, supporting the objectives of the National Education Policy 2020, yet Uttarakhand's specific decline relative to this generally improving national picture suggests that the state's elementary education system faces distinctive, state specific pressures not fully captured by the national aggregate trend (School Dropout Rate: UDISE+ 2025-26 and Performance Grading Index 2.0, Ensure IAS, 2026).

Uttarakhand's elementary education challenges are compounded by the demographic patterns discussed in Chapter 1, particularly the sustained hill to plains outmigration that has left several hill district schools with declining enrolment and, in the most extreme cases, functionally unviable student numbers as entire families relocate away from remote mountain villages. This demographic pressure on rural hill schools operates independently of, and in addition to, the more conventional elementary education quality challenges facing schools nationally, meaning that Uttarakhand's elementary education policy must address not only teaching quality and infrastructure, discussed in sections 5.5 and 5.6, but also the more fundamental question of how to sustain viable school operations in villages experiencing genuine demographic decline, a tension this framework examines further in the rural development context of Chapter 12.

The specific mechanics of this school viability challenge deserve elaboration, since it differs meaningfully from the more familiar elementary education access problems documented in India's larger, plains dominant states. In a typical plains state, elementary education policy challenges centre substantially on quality, teacher accountability, and learning outcomes within schools that reliably retain a stable or growing student population. In Uttarakhand's hill districts, by contrast, individual primary schools can see their enrolled student base fall from several dozen to a handful of children within the span of a few years as working age families relocate toward Dehradun, Haridwar, or destinations entirely outside the state, a pattern that forces difficult policy choices between maintaining genuinely under-enrolled schools at high per-student cost, consolidating multiple small hill schools into fewer, larger institutions that may require longer and more difficult student commutes across mountain terrain, or accepting some degree of educational access reduction in the state's most demographically declining villages. None of these options is straightforwardly satisfactory, and this framework does not attempt to resolve this genuine policy dilemma here, but rather flags it as a structural feature of Uttarakhand's elementary education planning that has no direct analogue in most other Indian states' education policy discourse.

5.2 Secondary and Senior Secondary Education: Transition and Achievement

National Gross Enrolment Ratios at the secondary and higher secondary levels stood at 77.4 per cent and 56.2 per cent respectively as reported in the Economic Survey 2024-25, with the government's stated ambition of achieving a 100 per cent Gross Enrolment Ratio in education by 2030 requiring accelerated progress at precisely these transition points, where enrolment typically declines most sharply relative to the near universal 93 per cent Gross Enrolment Ratio recorded at the primary level nationally (Economic Survey 2024-25, Careers360, 2025). Uttarakhand's own secondary and senior secondary transition rates must be understood against this national benchmark, with the state's comparatively strong literacy base discussed in Chapter 1 providing a reasonable foundation for secondary level participation even as the hill outmigration and school viability pressures discussed in section 5.1 continue to complicate secondary school access specifically within the state's more remote mountain districts.

The state government's flagship Atal Utkrisht Vidyalaya initiative, launched to elevate government secondary schools into model centres of academic excellence, represents the most significant recent state level policy response to strengthening secondary education quality. Implemented over a planned five year period from 2022-23 to 2026-27, the scheme provides upgraded physical infrastructure, digital classrooms, better trained teachers, and a curriculum explicitly designed to integrate academic instruction with co-curricular and life skills education, aligned with the National Education Policy 2020's broader vision of holistic student development (About Atal Utkrisht, Atal Utkrisht GIC Gairdikh, 2026). The scheme's design, targeting existing government secondary schools for elevation rather than constructing new institutions, reflects a resource efficient strategy appropriate to the fiscal constraints documented in Chapter 2, concentrating the state's limited discretionary education capital expenditure on strengthening a defined cohort of schools to genuine excellence rather

than spreading more limited improvement thinly across the state's entire secondary school network.

Complementing this school upgradation strategy, the state has also established Atal Awasiya Vidyalaya residential schools, which recruit experienced, retired education personnel on a contract basis for Principal, Administrative Officer, and Teacher positions, offering competitive fixed monthly remuneration intended to attract genuinely qualified personnel to these residential institutions, which serve students, including many from the state's more remote hill districts, who would otherwise face substantial daily commuting distances to access quality secondary education (Atal Awasiya Vidyalaya Recruitment 2025, Scribd, 2026). This residential school model offers a particularly well suited response to Uttarakhand's specific geographic challenge, discussed throughout this framework, of providing quality secondary education access to a population dispersed across genuinely difficult mountain terrain where daily commuting to a central school facility is often simply not feasible.

The decision to staff these residential schools substantially through retired, experienced educators rather than newly recruited early career teachers reflects a deliberate design choice with both advantages and limitations worth noting. On the positive side, this approach allows the state to draw on a pool of proven, experienced pedagogical talent without the multi-year training and probationary period that fresh recruits would require, a genuine advantage given the urgency of the learning outcome and Performance Grading Index concerns discussed in section 5.1. On the other hand, a recruitment model built around one year renewable contracts for retired personnel does not by itself build the kind of long-term, sustainable career pipeline of younger teachers that the state's broader school system will eventually require as this retired cohort ages further, suggesting that the Atal Awasiya Vidyalaya model should be understood as a valuable but likely time-limited bridging strategy rather than a permanent substitute for the more conventional teacher recruitment and career development pathway discussed in section 5.5.

5.3 Higher Education: Institutional Capacity, Gross Enrolment and Quality

Uttarakhand's higher education sector experienced a genuinely concerning enrolment decline in the period covered by the All India Survey on Higher Education for 2021-22, with the state recording an 8.4 per cent drop in total higher education enrolment compared to 2020-21, falling from 1,21,507 students to 1,12,557 students, placing Uttarakhand among only three states or union territories nationally, alongside Lakshadweep and Manipur, to record enrolment declines exceeding 5 per cent during this period, even as national higher education enrolment grew by 4.3 per cent over the same period, from 4.14 crore to 4.33 crore students (AISHE Report, Careers360, 2024). This decline was reported to be particularly concentrated at the doctoral level, in contrast to states such as Manipur and Kerala where comparable declines were concentrated at the undergraduate level instead, suggesting that Uttarakhand's higher education contraction during this period reflected challenges specific to the state's research and doctoral training ecosystem rather than a broader collapse in undergraduate access.

Nationally, the Gross Enrolment Ratio at the higher education level for the 18 to 23 age cohort reached 32.5 per cent in 2025, an increase from 28.4 per cent in 2021-22, attributed substantially to the National Education Policy 2020's emphasis on expanding college establishment and online learning opportunities (State-wise Analysis of Higher Education Enrollment in India, IndiaDataMap, 2026). Whether Uttarakhand's own Gross Enrolment Ratio has recovered to track this improving national trend following its 2021-22 decline represents an important open question for the state's higher education planners, one that underscores the importance of the statistical monitoring priorities discussed in Chapter 20 for tracking state specific higher education trajectories with the granularity the national aggregate figures alone cannot provide.

Uttarakhand's higher education institutional base includes several institutions of genuine national significance, most prominently the Indian Institute of Technology Roorkee, one of India's oldest and most prestigious technical institutions, and the Govind Ballabh Pant University of Agriculture and Technology at Pantnagar, established in 1960 as India's first agricultural university and a pioneering institution in the country's Green Revolution era agricultural research and extension system. This concentration of nationally significant research institutions provides Uttarakhand with a research and innovation foundation considerably stronger than its comparatively modest population and economic scale, discussed in Chapters 1 and 3, would otherwise suggest, a foundation this framework treats as an underutilised asset for the state's broader knowledge economy ambitions discussed in Chapter 17.

Beyond these flagship national institutions, Uttarakhand's higher education landscape includes a substantial number of state universities, private universities, and affiliated colleges distributed across both its plains and hill districts, though institutional density and quality vary considerably between the two, mirroring the broader hill-plains disparity documented throughout Chapter 1. The state's Doon University and Kumaon University, alongside HNB Garhwal University headquartered in Srinagar, Uttarakhand, represent the principal state university presence anchoring higher education access within the Garhwal and Kumaon regions specifically, though these state universities generally command less national visibility and resource capacity than the Indian Institute of Technology Roorkee and Pantnagar's agricultural university, a gap that has direct implications for whether students from the state's hill districts can access genuinely high quality higher education without relocating to Dehradun or beyond the state entirely. Strengthening the research capacity and infrastructure of these regional state universities, rather than allowing higher education excellence to remain concentrated almost exclusively within the state's two nationally prominent institutions, represents an important priority for ensuring that the benefits of higher education access are distributed more evenly across Uttarakhand's hill and plains geography.

The private higher education sector within Uttarakhand has expanded considerably over the past two decades, particularly in and around Dehradun, which has developed a genuine reputation as a preferred destination for private university and residential school establishment, drawing students from across northern India rather than serving the state's own

resident population exclusively. While this private sector growth has strengthened Dehradun's position as an education hub with associated economic benefits discussed in Chapter 3, it has not necessarily translated into improved higher education access for students from Uttarakhand's own hill districts, who frequently find private institution fee structures considerably less accessible than the public university and college system discussed above, a distinction with direct relevance to the equity considerations this chapter has emphasised throughout.

5.4 Technical, Vocational Education and Training Ecosystem

Uttarakhand's technical and vocational education ecosystem operates within the broader national skill development architecture, with the Comptroller and Auditor General's Report No. 3 of 2025, discussed in Chapter 2, specifically examining implementation of the Pradhan Mantri Kaushal Vikas Yojana 2.0 within the state, indicating sustained institutional audit attention to whether this flagship national skill development scheme is delivering genuine employment relevant training outcomes for Uttarakhand's youth population (Government of Uttarakhand, Report No. 3 of 2025, Comptroller and Auditor General of India, 2025). Given the state's comparatively narrower demographic dividend window discussed in Chapter 1, reflecting Uttarakhand's earlier than average fertility transition, ensuring that the state's vocational training infrastructure translates efficiently into formal sector employment carries particular urgency relative to states where a larger, more slowly maturing youth cohort affords somewhat greater policy runway.

The state's polytechnic institution network, coordinated through mechanisms including the state's polytechnic entrance examination process, provides a further important technical education pathway complementing the university level higher education discussed in section 5.3, particularly for students seeking direct entry into skilled technical employment without pursuing a full undergraduate degree programme. Given Uttarakhand's substantial pharmaceutical manufacturing and industrial base concentrated in the Haridwar and Udham Singh Nagar industrial belts, discussed in Chapter 4, closer integration between the state's polytechnic and vocational training curriculum and the specific skill demands of these manufacturing clusters represents an important opportunity to improve the employment relevance of technical education outcomes.

Tourism and hospitality vocational training carries particular strategic relevance for Uttarakhand given the state's substantial pilgrimage and adventure tourism economy discussed in Chapter 19, since the seasonal, service intensive nature of Char Dham Yatra and broader hill tourism employment requires a workforce equipped with hospitality, guiding, and visitor safety skills that conventional academic education does not typically provide. Expanding dedicated tourism and hospitality vocational training capacity within the state's hill districts specifically, rather than concentrating such training exclusively in Dehradun and the plains districts, would allow local hill communities to capture a greater share of the economic value generated by the tourism activity occurring in their own home districts, a theme connected to the intra-state disparity discussion in Chapter 1.

A further, increasingly significant frontier for Uttarakhand's vocational training ecosystem concerns adventure tourism and mountaineering guide certification, given the state's status as a leading national destination for trekking, mountaineering, river rafting, and related high risk outdoor recreation activities discussed in Chapter 19. The Nehru Institute of Mountaineering at Uttarkashi, one of India's premier mountaineering training institutions, provides a nationally recognised certification pathway for mountaineering and high altitude trekking guides, representing a genuinely distinctive vocational training asset not replicated in most other Indian states. Expanding the throughput and accessibility of this specialised training pathway, and ensuring certified graduates find sustained local employment within the state's adventure tourism sector rather than migrating to other Himalayan destinations or overseas expedition companies, represents a meaningful opportunity to convert Uttarakhand's genuine mountaineering training excellence into durable local economic benefit, connecting directly to both the tourism development priorities discussed in Chapter 19 and the disaster preparedness value that a larger pool of professionally trained high altitude guides provides for search and rescue operations following events such as the 2013 Kedarnath floods and 2021 Chamoli disaster discussed in Chapter 14.

5.5 Teacher Recruitment, Training and Professional Development

Teacher recruitment within Uttarakhand's government school system has faced persistent vacancy challenges, with the state's School Education Department reporting approximately 2,100 vacant Assistant Teacher posts in primary schools as of late 2025, of which recruitment was proceeding for 1,649 posts across the state's thirteen districts, while a further 451 posts remained subject to pending High Court litigation (Uttarakhand Primary Teacher Basic Recruitment 1649 Posts, DyaRakoti, 2026). This recruitment drive, opened for applications from 8 November 2025, was explicitly directed to proceed in accordance with both Right to Education Act norms and National Education Policy student-teacher ratio guidelines, and included provision allowing serving private school teachers who had completed the National Institute of Open Schooling's Diploma in Elementary Education to apply under a special recruitment window, following a Supreme Court directive on this specific qualification pathway (Uttarakhand Primary Teacher Basic Recruitment 1649 Posts, DyaRakoti, 2026).

This scale of primary teacher vacancy, exceeding two thousand positions in a state of Uttarakhand's comparatively modest population, connects directly to the Performance Grading Index decline discussed in section 5.1, since teacher availability constitutes one of the Index's core tracked dimensions, and sustained vacancy at this scale plausibly contributes materially to the state's recent underperformance on this composite measure relative to the generally improving national trend. Teacher certification within the state operates through the Uttarakhand Board of School Education's Teacher Eligibility Test, conducted in two tiers, UTET-I for elementary level teachers and UTET-II for upper primary and secondary level teachers, alongside a dedicated Diploma in Elementary Education entrance examination, both administered on a regular annual cycle to maintain a qualified pool of certified teaching candidates available for recruitment (Uttarakhand Board of School Education, 2026).

Professional development for teachers deployed within the state's flagship Atal Utkrisht Vidyalaya schools, discussed in section 5.2, is delivered through a dedicated screening examination process specifically for teacher placement within these upgraded schools, reflecting the state government's recognition that elevating a school's physical infrastructure alone is insufficient without a correspondingly rigorous process for ensuring that teaching staff posted to these flagship institutions possess the pedagogical capability the programme's model school ambitions require (Uttarakhand Board of School Education, 2026). Extending this more rigorous, competency based teacher placement approach beyond the Atal Utkrisht Vidyalaya cohort to the broader government school system represents an important, if resource intensive, longer term professional development priority for the state's Education Department.

The geographic dimension of teacher deployment represents a further, distinctly Uttarakhand specific professional development and human resource management challenge. Postings to the state's most remote hill schools, often located a full day's travel or more from the nearest district headquarters and lacking reliable mobile connectivity, electricity, or basic housing infrastructure for teaching staff, are widely regarded within the state's teaching workforce as considerably less desirable than postings in Dehradun, Haridwar, or other plains and foothill towns, creating a persistent incentive for teachers to seek transfer toward more accessible postings at the earliest administratively permissible opportunity. This dynamic means that the state's most educationally disadvantaged schools, precisely those serving the hill communities documented throughout this chapter as facing the sharpest combination of outmigration, teacher vacancy, and infrastructure deficit, are also those least able to retain experienced teaching staff for a sustained period, creating a self-reinforcing cycle of disadvantage that purely numerical teacher recruitment targets, discussed above, do not on their own resolve. Structured hardship postings incentives, including accelerated promotion eligibility, hardship allowances calibrated to genuine remoteness rather than administrative district boundaries alone, and guaranteed preferred posting rights following a defined period of hill service, represent policy instruments other Himalayan and hill states have used with some success to address this specific retention challenge, and merit serious consideration within Uttarakhand's own teacher management framework.

5.6 Digital Education, EdTech Integration and ICT in Schools

Digital infrastructure within Uttarakhand's school system has expanded as part of the broader national improvement documented in the Economic Survey 2024-25, which found that the share of schools nationally equipped with computers rose from 38.5 per cent in 2019-20 to 57.2 per cent in 2023-24, a trend the state's own flagship Atal Utkrisht Vidyalaya scheme, discussed in section 5.2, has specifically sought to accelerate within its cohort of upgraded schools through dedicated digital classroom infrastructure investment (Economic Survey 2024-25, Careers360, 2025). Given Uttarakhand's mountainous terrain and dispersed hill settlement pattern discussed in Chapter 1, digital education infrastructure carries particular potential value for the state, offering a pathway to extend specialist subject instruction,

remedial support, and teacher training resources to remote hill schools that would otherwise struggle to attract or retain subject specialist teachers, discussed in section 5.5.

The Ministry of Education's national UDISE+ 2025-26 reporting specifically identified improved digital infrastructure as a contributing factor to the generally narrowing performance gap between India's highest and lowest scoring states on the Performance Grading Index, from 51 per cent in 2017-18 to 31.4 per cent in the most recent assessment, even as Uttarakhand's own score moved in the opposite direction during the most recent single year comparison, discussed in section 5.1 (School Dropout Rate: UDISE+ 2025-26 and Performance Grading Index 2.0, Ensure IAS, 2026). This apparent tension, national digital infrastructure improvement coinciding with Uttarakhand's own composite score decline, suggests that digital infrastructure investment alone, absent complementary improvement in teacher availability and student retention discussed elsewhere in this chapter, may not be sufficient on its own to reverse the state's recent Performance Grading Index trajectory.

Realising digital education's full potential within Uttarakhand's specific hill geography will require sustained attention to the underlying connectivity infrastructure discussed in Chapter 16, since digital classroom equipment delivers limited educational value in schools lacking reliable electricity supply or internet connectivity, both of which remain considerably less consistent across the state's remote hill districts than in Dehradun, Haridwar, and the state's other plains urban centres. Prioritising digital education infrastructure investment specifically within the hill districts facing the most acute teacher vacancy and school viability pressures discussed in sections 5.1 and 5.5, rather than distributing investment uniformly across the state, would likely generate greater marginal educational benefit given the particular value digital resources offer as a substitute for scarce specialist teaching capacity in precisely these underserved locations.

Satellite and offline capable digital content delivery, rather than exclusively internet dependent EdTech platforms, deserves particular consideration within Uttarakhand's digital education strategy given the persistent connectivity gaps documented above, since a digital education model that assumes reliable broadband access will systematically underserve exactly the hill schools that stand to benefit most from digital resources as a substitute for locally unavailable specialist teaching capacity. Pre-loaded tablet or local server based content libraries, requiring only periodic rather than continuous connectivity for updates, offer one practical technical approach already piloted with some success in other geographically remote Indian regions, and represent a model Uttarakhand's Education Department could reasonably adapt for its own hill school digital education rollout, rather than defaulting to the continuous connectivity assumptions that shape most EdTech platform design for India's larger, better connected plains states.

5.7 Special Education: Children with Disabilities and Inclusive Schooling

Special education provision within Uttarakhand's school system operates under the same national Rights of Persons with Disabilities Act 2016 framework applicable across all Indian states, requiring both inclusive mainstream schooling accommodation and, where necessary,

specialised institutional support for children with disabilities up to the age of eighteen. The state's teacher recruitment architecture, discussed in section 5.5, includes a dedicated Primary Teacher Special Education recruitment stream operating alongside the general primary teacher recruitment drive, indicating institutional recognition that special education staffing requires a distinct, appropriately qualified recruitment pathway rather than being addressed solely through general teacher deployment (Uttarakhand Primary Teacher Special Education Recruitment, DyaRakoti, 2026).

The particular geographic challenges documented throughout this chapter, spanning the state's dispersed hill settlement pattern, its teacher vacancy pressures discussed in section 5.5, and its declining Performance Grading Index score discussed in section 5.1, carry compounded implications for special education access specifically, since children with disabilities in remote hill villages face not only the general access barriers confronting all students in these locations but the additional challenge of accessing appropriately trained special education teachers and assistive technology resources that are typically concentrated, where available at all, in the state's larger towns and plains districts. This suggests that inclusive schooling gaps in Uttarakhand are likely to mirror, and potentially compound, the broader hill-plains educational disparity documented throughout this chapter, a pattern this framework's social justice chapter examines further in the specific context of disability rights discussed in Chapter 7.

Strengthening special education provision within the state's Atal Utkrisht Vidyalaya flagship schools, discussed in section 5.2, and within the residential Atal Awasiya Vidyalaya network, discussed in the same section, offers a potentially efficient pathway for concentrating scarce special education expertise within a defined set of well resourced institutions capable of serving students from a wider surrounding catchment area, rather than attempting to distribute thinly stretched special education capacity uniformly across every individual government school in the state's hill districts, an approach that would likely prove infeasible given the acute teacher recruitment challenges already documented in section 5.5.

Transportation and physical accessibility present a further, particularly acute dimension of the special education challenge in Uttarakhand's specific terrain, since even where an appropriately resourced special education facility exists within reasonable administrative distance, the steep, often unpaved mountain paths connecting remote hill hamlets to the nearest motorable road can present a genuinely prohibitive physical barrier for a child with a mobility related disability, in a manner that has no direct equivalent in flatter, more infrastructure connected states. Addressing this dimension of special education access will require close coordination between the Education Department's special education programming and the broader rural road connectivity investment discussed in Chapter 8, since improving the physical accessibility of the routes connecting remote hill households to their nearest special education resource may, in some cases, do more to improve actual special education access than any purely education sector specific intervention could achieve on its own.

5.8 State-Specific Educational Challenges and Reform Priorities

Uttarakhand's education system confronts a genuinely distinctive combination of challenges that together shape this framework's reform priorities for the sector. Foremost among these is the tension between the state's comparatively strong historical literacy base, discussed in Chapter 1, and its recent Performance Grading Index decline, discussed in section 5.1, a decline this chapter has connected specifically to the substantial primary teacher vacancy documented in section 5.5 and the persistent rural hill school viability pressures created by sustained outmigration discussed throughout this framework. Addressing the primary teacher vacancy directly, through accelerated completion of the 1,649 post recruitment drive currently underway and expedited resolution of the litigation affecting the remaining 451 posts, represents the single most immediate, actionable reform priority available to the state's Education Department.

A second distinctive challenge concerns the state's higher education enrolment trajectory, discussed in section 5.3, where the 2021-22 decline of 8.4 per cent, concentrated particularly at the doctoral level, stands in sharp contrast to Uttarakhand's genuinely strong research institution base anchored by the Indian Institute of Technology Roorkee and the Govind Ballabh Pant University of Agriculture and Technology. Understanding whether this doctoral enrolment decline reflects genuine capacity constraints, funding limitations for research scholarships, or a broader pattern of talented students pursuing doctoral study outside the state entirely represents an important diagnostic priority before the state can design an effective policy response, connecting to the statistical system strengthening priorities discussed in Chapter 20.

A third priority, cutting across nearly every section of this chapter, concerns the persistent hill-plains educational disparity that mirrors the broader demographic and development disparities documented throughout this framework. The state's flagship Atal Utkrisht Vidyalaya and Atal Awasiya Vidyalaya initiatives, discussed in section 5.2, represent genuinely promising responses to this disparity, offering models for concentrating scarce educational resources into a defined set of high quality institutions accessible to students from across a wider hill catchment area rather than attempting uniform, and consequently thinly spread, improvement across every individual school. Scaling these residential and model school approaches, while simultaneously resolving the underlying teacher vacancy crisis discussed in section 5.5 and extending digital infrastructure investment strategically to the state's most underserved hill schools discussed in section 5.6, together constitute the core education reform agenda this framework identifies as essential to reversing Uttarakhand's recent Performance Grading Index decline and ensuring the state's youth population, discussed in Chapter 1, is genuinely equipped to participate in the economic opportunities the state's broader Viksit Uttarakhand at 2047 ambitions, discussed in the Preface, are intended to generate.

A fourth and final priority worth naming explicitly concerns the sequencing of education reform relative to the state's broader economic ambitions documented throughout this framework. Uttarakhand's Gross State Domestic Product growth, discussed in Chapter 2, and

its investment promotion strategy, discussed in Chapter 4, are both proceeding at a pace that, on current trajectory, risks outstripping the state's capacity to supply a correspondingly well educated and appropriately skilled local workforce, discussed in section 5.4, to fill the resulting employment opportunities. Should this gap persist, the more likely outcome is not unemployment among Uttarakhand's own youth population but rather in-migration of skilled workers from other states to fill positions the state's own graduates are not yet equipped for, a pattern that would allow the state's aggregate GSDP figures to continue rising, discussed in Chapter 3, without necessarily improving employment and income outcomes for the state's own residents, particularly those from the hill districts whose educational disadvantage, documented throughout this chapter, already places them at a competitive disadvantage relative to migrants from India's more educationally developed states. Ensuring that the education reforms identified throughout this chapter proceed with genuine urgency, rather than at a pace lagging the state's economic and investment ambitions, therefore represents not merely a social equity concern but a precondition for the state's own residents to be the primary beneficiaries of the economic transformation this Comprehensive Development Framework documents throughout its remaining chapters.

Chapter 6: Health, Nutrition and Population

Uttarakhand's health system carries a double burden that is unusual even among India's hill states. It must run a dispersed network of small facilities across some of the country's most difficult terrain, where a single Community Health Centre may serve villages a full day's walk apart, while simultaneously absorbing the acute seasonal shock of the Char Dham Yatra, a pilgrimage that brings a floating population several times the size of the resident population into four high-altitude shrine towns for roughly six months each year. This chapter examines the state's public health infrastructure and staffing gaps, its communicable and non-communicable disease burden, its maternal and child health record, its approach to universal health coverage, mental health services, nutrition programming, population stabilisation, and the broader reform agenda needed to make the system resilient to both routine and seasonal stress.

6.1 Public Health Infrastructure: Facilities, Human Resources and Gaps

Uttarakhand's facility network falls well short of the norms it is meant to meet. Under Indian Public Health Standards (IPHS) 2012 guidelines, a Community Health Centre (CHC) should serve 80,000 people in hilly or tribal areas and 120,000 in the plains, a Primary Health Centre (PHC) should serve 20,000 and 30,000 respectively, and a Sub-Health Centre (SHC) should serve 3,000 and 5,000 respectively. A Comptroller and Auditor General performance audit of the state's public health infrastructure, covering the period up to March 2022, found that against a requirement of 127 CHCs, the state had only 86 as of 31 March 2016 and just 79 by 31 March 2022, a decline explained by some CHCs being upgraded to sub-district hospitals rather than by new construction; against a requirement of 3,095 SHCs, the state had 1,897 in 2016 and only 1,904 six years later, essentially flat (Comptroller and Auditor General of India, 2024). PHCs did expand substantially over the same period, from 45 to 578, largely through the redesignation of existing State Allopathic Dispensaries under IPHS adoption rather than new builds.

The 2020-21 Rural Health Statistics, cited in the same audit, show that of the state's Sub-Health Centres, 24 percent operated in rented buildings, 72 percent lacked separate toilets for men and women, 34 percent had no ANM staff quarters, and 28 percent had no electricity connection. Of Primary Health Centres, 37 percent had no labour room and 53 percent had no operation theatre. Of Community Health Centres, 89 percent lacked all four of the required specialist doctors (Comptroller and Auditor General of India, 2024). Field verification in Dehradun and Nainital districts turned up specific, almost anecdotal illustrations of this shortfall: a sub-centre in Kaulagarh, Dehradun functioning out of a rented room being used as a storeroom, an unequipped operation theatre at a Kotabagh CHC being used to store clean linen, and a labour room at a Harrawala sub-centre similarly repurposed as storage.

The state's rollout of Health and Wellness Centres, the primary-care backbone of Ayushman Bharat, shows a similar pattern of nominal targets met alongside real quality gaps. Of 1,885

facilities the Government of India approved for construction or facade branding into Health and Wellness Centres between 2017 and 2022, with a budget of Rs 156.26 crore, the state completed 1,475, or 78 percent, while utilising only Rs 93.73 crore of the approved funds. The state exceeded its operationalisation target, activating 1,462 centres against a target of 1,396, and posted Community Health Officers or Medical Officers at all of them. But audit inspection found several centres built with steep iron staircases to first-floor consulting rooms unsuited to pregnant women or elderly patients, two hill-district centres with no motorable approach road at all, and Yoga instructors, a mandated wellness component, present at only 613 of the 297 test-checked operational centres, a shortfall the state attributed to the low honorarium on offer in remote postings.

The state's parallel AYUSH health infrastructure, comprising 551 Ayurveda facilities and 110 Homoeopathic dispensaries as of the 2022 audit, shows comparable strain: 38 percent of these facilities lacked a reliable water supply, 36 percent lacked electricity, and 96 percent lacked fire-fighting equipment. A long-running example of infrastructure delay is the new building for Government Doon Medical College, sanctioned in December 2011 at an estimated cost of Rs 293.81 crore, which had still not been completed as of the audit despite three cost revisions taking the estimate to Rs 417.80 crore and actual expenditure of Rs 386.90 crore, a gap of more than a decade between sanction and completion.

On staffing, the state has moved to address a persistent shortage of doctors in remote postings. In September 2025, the Health and Medical Education Minister announced the recruitment of 300 additional doctors after 220 posts in the Provincial Medical and Health Services cadre had recently been filled and deployed to remote health centres, while the state simultaneously took action against 234 absent bond-holding doctors, graduates of government medical colleges obligated to serve in the state, and terminated the services of 56 who had been absent for a long time (Press Trust of India, 2025). As of mid-2026, the National Health Mission in Uttarakhand continued to advertise walk-in interviews for vacant Medical Officer and specialist posts (National Health Mission Uttarakhand, 2026), indicating that the vacancy problem, while being actively worked on, has not yet been closed. The same recruitment drive has extended to mid-level cadres: the National Health Mission has periodically invited applications for Community Health Officers and Mid-Level Health Providers, contractual staff trained through a six-month IGNOU-certified community health programme who are meant to staff the Health and Wellness Centres described above, though the state's ability to retain these contractual staff in the same remote postings where doctor retention has proven difficult remains an open question not fully answered by recruitment notice volume alone.

6.2 Epidemiological Profile: Communicable and Non-Communicable Disease Burden

Uttarakhand's disease burden combines the same non-communicable disease transition seen across India, rising cardiovascular disease, diabetes and hypertension linked to ageing and changing lifestyles, with a distinctive seasonal shock unique to its role as a pilgrimage state.

Every year between late April and November, the Char Dham Yatra draws several million pilgrims to the four Himalayan shrines of Yamunotri, Gangotri, Kedarnath and Badrinath, each above 3,000 metres in altitude, and every year a predictable share of them die en route, overwhelmingly from causes linked to altitude, exertion and pre-existing cardiac risk rather than from infectious disease. Official figures cited in the state's own 2025 pilgrim health advisory put the toll at 246 deaths in the 2024 season and 242 in 2023, with high-altitude sickness, oxygen deficiency and cardiac arrest identified as the most common reasons behind pilgrim deaths (India TV News, 2025). The state's response has included pre-yatra health advisories in twelve languages urging cardiovascular conditioning before travel, and, more structurally, a persistent acknowledgement from senior officials of a shortage of cardiologists willing to serve in the high-altitude shrine towns even at above-average remuneration, a gap partly filled by physicians given short cardiology orientation training before deployment.

Beyond the Yatra corridor, the state's non-communicable disease burden follows the broader north Indian pattern of rising hypertension and diabetes prevalence, though Uttarakhand-specific prevalence surveys remain thinner than the national NCD screening programme's aggregate reporting would suggest is needed for a state with such a large elderly and dispersed hill population. Tuberculosis, historically concentrated in the state's more urbanised Terai belt, continues to be managed through the national TB elimination programme's district-level DOTS network, though granular, state-specific case-finding data proved difficult to source independently for this chapter, an evidentiary gap flagged here for the statistical strengthening agenda in Chapter 20.6 rather than papered over with an unverified figure.

The state's epidemiological profile is also shaped by a structural divide between its plains and hill districts that the health infrastructure data in section 6.1 already foreshadows. Udham Singh Nagar and Haridwar, the same two industrially dense plains districts profiled in Chapter 4.3, carry a disease pattern closer to the rest of the Gangetic plains, with air and water pollution-linked respiratory and gastrointestinal illness more prominent alongside the emerging non-communicable disease burden, while the thirteen hill districts combine a smaller absolute disease burden with a much harder access problem, since a single specialist gap at a district hospital can mean a multi-hour journey for a patient rather than a short referral within an urban cluster. This divide means that state-level averages for most epidemiological indicators tend to understate the severity of access-related outcomes in the hill districts even where raw disease incidence looks moderate.

On communicable disease preparedness more broadly, the 2026 introduction of the e-Swasthya Dham real-time health monitoring portal for the Char Dham route, alongside a fleet of 177 ambulances including advanced life support and cardiac ambulances, a boat ambulance in Tehri, and a helicopter ambulance operated through AIIMS Rishikesh (News on Air, 2026), illustrates the state's shift toward treating pilgrimage-season mortality as a manageable, monitorable public health event rather than an unavoidable seasonal toll. Extending a comparable level of real-time monitoring to routine disease surveillance across

the hill districts, rather than concentrating it on the highest-visibility pilgrimage corridor, remains an open task for the state's epidemiological surveillance architecture.

6.3 Maternal and Child Health: MMR, IMR, Under-5 Mortality and Nutrition

Uttarakhand's maternal and child health trajectory shows genuine, measurable progress on some indicators alongside a maternal mortality trend that has moved in the wrong direction relative to the national picture.

On maternal mortality, Sample Registration System data placed Uttarakhand's Maternal Mortality Ratio at 99 per 100,000 live births for 2016-18, and a separate bulletin put it at 101 for 2017-19, comfortably inside the National Health Policy's target band of 100 to 150 (PMC/Frontiers, 2022; Drishti IAS, 2020). However, unlike most major states, Uttarakhand's MMR rose again above 100 by the 2018-20 bulletin, one of the states, alongside West Bengal and Haryana, where maternal mortality moved against the otherwise steady national decline over that period (Factly, 2022). This reversal is consistent with the infrastructure gaps documented in section 6.1: a Community Health Centre network well short of its required strength, with the large majority still missing at least one of the four specialist posts needed to manage obstetric emergencies, constrains the referral chain precisely at the point where maternal deaths are most preventable.

On child health, the picture is more consistently positive. The state's stunting rate among children under five fell from 44 percent in NFHS-3 (2005-06) to 34 percent in NFHS-4 (2015-16) to 27 percent in NFHS-5 (2019-2021), and a secondary compilation of the newly released NFHS-6 (2023-24) state factsheets puts Uttarakhand's stunting rate at approximately 20 percent, a seven-percentage-point gain that the same compilation ranks among the largest improvements of any state in this survey round, with full child immunisation coverage at approximately 86 percent against a national figure of 82.6 percent, and an infant mortality rate, drawn from Sample Registration System data rather than the NFHS itself, of 20 deaths per 1,000 live births (Vyasa Integrated Healthcare, 2026). Wasting among children under five fell from 19 percent in both NFHS-3 and NFHS-4 to 13 percent in NFHS-5, while underweight prevalence fell from 38 percent to 27 percent to 21 percent over the same three survey rounds; anaemia among children, by contrast, remained at 61, 60 and 59 percent respectively across the same rounds, showing essentially no improvement even as other undernutrition indicators moved favourably. All thirteen of the state's districts were classified as districts of public health concern for either stunting or anaemia in this 2022 nutrition profile, out of an estimated 891,280 children under five statewide (NITI Aayog, 2022).

One of the more striking shifts in the state's demographic health data is in the sex ratio at birth, which improved from 888 female births per 1,000 male births in NFHS-4 to 984 in NFHS-5, one of the largest improvements recorded among India's larger states over that survey interval, alongside Karnataka's rise from 910 to 978 (CEDA, Ashoka University, 2024). This marks a significant reversal from the state's early-2010s trajectory, when the 2011 Census recorded a child sex ratio of 890 girls per 1,000 boys, the seventh lowest among India's states and union territories at the time, and an Asian Centre for Human Rights study

warned the ratio could fall toward 800 by the 2021 Census if underlying trends continued unchecked (Tribune News Service, n.d.). Whether this improvement has been sustained through NFHS-6 could not be confirmed from sources available for this chapter and should be verified against the primary Uttarakhand NFHS-6 factsheet once fully disaggregated state data is published.

6.4 Universal Health Coverage: State Health Assurance Schemes

Uttarakhand was the first hill state in India to move beyond the coverage ceiling of the central Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) toward a state-funded universal health assurance model. Then Chief Minister Trivendra Singh Rawat launched the Atal Ayushman Uttarakhand Yojana, making Uttarakhand the first hill state in the country to offer universal health coverage, under which every household can avail medical treatment of up to Rs 5 lakh annually (Tnpsctherupettagam, n.d.). This expanded free medical coverage from the roughly 5 lakh families originally eligible under PM-JAY to all 23 lakh families in the state (Nagar Nigam Rishikesh, n.d.), with the state budgeting Rs 500 crore for the scheme in 2024-25 (Govt Schemes India, n.d.).

Utilisation data at the district level illustrates both the scheme's reach and its fiscal weight: in Dehradun district alone, more than 9 lakh people had used the programme, with the state having spent over Rs 1,720 crore on treatments in that district so far (Meher Hospital Dehradun, 2025). The scheme integrates with the national Ayushman Bharat Health Account (ABHA) digital health ID system, intended to give both patients and providers portable digital medical records across the state's public and empanelled private hospital network.

At the national level, the two centrally sponsored programmes on which Uttarakhand's coverage architecture rests, PM-JAY and the PM Ayushman Bharat Health Infrastructure Mission (PM-ABHIM), both saw increased allocations in the Union Budget 2026-27. PM-JAY's allocation rose to Rs 9,500 crore from Rs 9,000 crore in the FY26 revised estimate, and PM-ABHIM's allocation rose by 71.9 percent to Rs 4,200 crore from Rs 2,443 crore (India Brand Equity Foundation, 2026). For a hill state whose own Health and Wellness Centre construction has lagged its approved targets, as documented in section 6.1, the scale of this central infrastructure allocation matters as much to Uttarakhand's coverage story as the state-funded insurance expansion itself, since insurance coverage without a functioning referral network of CHCs and district hospitals to actually deliver the covered procedures risks becoming coverage on paper rather than in practice, particularly in the state's hill districts where the specialist-doctor shortfall is most acute.

This distinction between financial coverage and physical service availability matters more in Uttarakhand than in a flatter, more urbanised state, because the AAUY's cashless entitlement is only as useful as the nearest empanelled hospital capable of delivering the covered procedure. A cardiac or obstetric emergency in a hill block several hours from the nearest district hospital gains little from a Rs 5 lakh annual entitlement if no empanelled facility within reach can perform the required procedure, meaning that the state's parallel investments in ambulance networks, referral transport, and specialist deployment function as a necessary

complement to the insurance scheme rather than a separate policy track. Future monitoring of AAUY's impact should therefore track not just enrolment and claims value, the two metrics most commonly cited in official communications, but also the geographic distribution of empanelled hospitals relative to the hill districts' population, and the share of claims paid out for treatment received outside the beneficiary's home district.

6.5 Mental Health Services: Availability, Access and Stigma Reduction

Mental health service delivery in Uttarakhand runs through the same three-tier national architecture as the rest of the country, the District Mental Health Programme (DMHP) under the National Mental Health Programme, the Ayushman Arogya Mandir primary care integration effort, and the Tele-MANAS tele-mental health helpline, but the state's record on actually spending the funds available for this architecture is weak. A review of state-wise DMHP fund utilisation found that states with the highest utilisation were Andhra Pradesh (78 percent), West Bengal (71 percent) and Chhattisgarh (64 percent), while states with the lowest utilisation of funds were Telangana (5 percent), Uttarakhand (12 percent) and Jharkhand (Centre for Mental Health Law and Policy, 2026). Since DMHP funds are earmarked specifically for psychosocial interventions, community awareness activities, and district-level prevention and promotion work, this level of underutilisation implies that a meaningful share of the mental health services the programme is designed to deliver are simply not reaching Uttarakhand's population at the scale the allocated budget was meant to support.

Tele-MANAS has been rolled out nationally, with 36 States/UTs having set up 53 Tele MANAS cells that have together handled more than 11,76,000 calls on the helpline as of July 2024 (Ministry of Home Affairs, 2024). This helpline model is particularly relevant to Uttarakhand's hill districts, where the acute shortage of psychiatrists documented for physical specialties in section 6.1 applies with at least equal force to mental health specialists, making a remote, phone-based first point of contact one of the few currently feasible ways to reach populations in the state's more remote valleys.

Stigma reduction and community-level awareness, the third pillar alongside service availability and access, remains the least measurable component of the state's mental health effort, and no Uttarakhand-specific survey data on stigma or help-seeking behaviour could be located for this chapter. Given the DMHP fund utilisation shortfall documented above, and given that awareness and de-stigmatisation activities are precisely the category of spending the DMHP allocation is meant to cover, closing that utilisation gap is likely to be a precondition for any measurable progress on stigma reduction, rather than a separate initiative that can proceed independently of it.

Two further factors compound the access problem in Uttarakhand specifically. First, outward migration of working-age adults from hill villages leaves a disproportionately elderly and female resident population in many hill blocks, a demographic profile associated elsewhere in India with higher rates of untreated depression and social isolation, yet one for which the state has no dedicated geriatric mental health programme distinct from the general DMHP

architecture. Second, the same seasonal concentration of health resources around the Char Dham Yatra that shapes the epidemiological picture in section 6.2 also shapes staff availability for routine mental health care, since psychiatrists and counsellors based in district hospitals are among the cadres most likely to be temporarily redeployed to pilgrimage-route medical posts during the Yatra season.

6.6 Nutrition Programmes: ICDS, Mid-Day Meal and Poshan Abhiyan

Uttarakhand's nutrition programming runs through the same national architecture as the rest of India, the Anganwadi-based Integrated Child Development Services network, now folded into Mission Saksham Anganwadi and Poshan 2.0, together with the school Mid-Day Meal scheme and the Poshan Abhiyaan behaviour-change campaign, but the state's own undernutrition data suggests this architecture has yet to fully close the gap for the state's youngest children.

As documented in section 6.3, the NITI Aayog's 2022 State Nutrition Profile classified all thirteen of the state's districts as districts of public health concern for either childhood stunting or anaemia, using severity thresholds of 20 percent prevalence for stunting and 40 percent for anaemia. Anaemia among children under five in particular has shown essentially no improvement across three successive National Family Health Survey rounds, remaining at roughly 59 to 61 percent since 2005-06, a stagnation shared with anaemia among non-pregnant women, which fell only from 55 percent to 42 percent over the same fifteen-year span, both patterns pointing to iron-deficiency anaemia as the nutrition programme's least-solved problem in the state even as stunting and underweight prevalence have improved more visibly (NITI Aayog, 2022).

Nationally, Mission Poshan 2.0 has scaled rapidly on paper: as of September 2025, over 72 lakh pregnant women were registered under the scheme, with maternity benefits delivered to more than 4.05 crore beneficiaries since inception, and 14,02,248 Anganwadi Centres and over 9.14 crore beneficiaries were registered on the Poshan Tracker app (India Brand Equity Foundation, 2025). The Saksham Anganwadi component targets the upgrade of 2 lakh Anganwadi Centres nationally, with Rs 40,000 per year allocated per centre up to 2025-26 (News on Air, 2025). State-disaggregated figures on how many of Uttarakhand's own Anganwadi Centres have been approved for or completed under this upgradation drive were not available in the sources consulted for this chapter, a gap this framework flags for follow-up using the state's own Women and Child Development Department reporting.

The persistence of high childhood anaemia despite more than a decade of ICDS supplementary nutrition and, more recently, Poshan 2.0's explicit anaemia-reduction targets, suggests that iron and micronutrient delivery through the Anganwadi supplementary nutrition programme has not translated into biochemical improvement at the rate seen for anthropometric indicators like stunting and wasting in Uttarakhand, an anomaly worth dedicated investigation by the state's health and women and child development departments jointly.

The school-age nutrition complement to Anganwadi services is the Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) scheme, the renamed and expanded Mid-Day Meal programme, which provides a hot cooked meal to children from pre-primary Bal Vatika through Class VIII in government and government-aided schools nationally. Uttarakhand is one of the Himalayan special category states, alongside Himachal Pradesh and Jammu and Kashmir, that receives PM POSHAN funding on a 90:10 Centre-state ratio rather than the standard 60:40 split applied to most other states (Model Diplomat, 2026). Despite this more generous funding formula, at least one independent review of national coverage data found Uttarakhand among the populous states where Mid-Day Meal coverage rates relative to enrolment were significantly low as of 2018-19 (Nickled and Dimed, 2025). Whether this coverage gap has since narrowed under the PM POSHAN rebranding and its 2021-26 continuation could not be confirmed from state-specific, more recent sources available for this chapter, and should be tracked through the Department of School Education's own annual monitoring data, alongside the school-level attendance data covered in Chapter 5.1.

6.7 Population Stabilisation and Family Planning

Uttarakhand's demographic transition has already passed the point most population-stabilisation policy is designed to reach. As one of the states covered in the second phase of NFHS-5 fieldwork, all Phase-II states achieved replacement-level fertility of 2.1 or below except Madhya Pradesh, Rajasthan, Jharkhand and Uttar Pradesh (Ministry of Health and Family Welfare, 2021), placing Uttarakhand among those that had already reached replacement fertility by the time of the survey. This places Uttarakhand's family planning programme in a different position from many of its northern neighbours: the policy challenge is now less about reducing fertility toward replacement level and more about consolidating contraceptive access, addressing unmet need in the state's more remote hill blocks, and managing the downstream effects of an ageing population structure that a below-replacement, out-migrating hill population is likely to produce over the coming two decades, a theme picked up further in Chapter 7.6 on elderly welfare.

Contraceptive access itself has historically shown limited change in method mix. A Ministry of Health and Family Welfare-affiliated policy brief noted that the proportion of limiting methods of contraception in Uttarakhand remained unchanged at 61 percent between 2005-06 and 2010-11, against an overall goal of meeting 60 percent of the state's unmet need for family planning, then estimated at 29.7 percent (National Institute of Health and Family Welfare, n.d.). More recent, disaggregated contraceptive prevalence and unmet-need figures specific to Uttarakhand from NFHS-5 or NFHS-6 could not be independently verified from the sources consulted for this chapter.

The heavy reliance on permanent, limiting methods documented in that historical policy brief, rather than a mix that includes more reversible, spacing-oriented methods, is itself a signal worth flagging for the state's family planning programme design, since a contraceptive method mix skewed toward sterilisation is generally associated with less flexibility for younger couples still spacing births. Combined with the below-replacement fertility levels

already achieved statewide, this pattern points toward a hill demographic profile that will age relatively quickly over the next two decades even without further fertility decline, reinforcing the case for the state to begin scaling geriatric and long-term care infrastructure well ahead of the point at which population ageing becomes acute.

The sex ratio at birth improvement documented in section 6.3, from 888 in NFHS-4 to 984 in NFHS-5, is arguably the single most consequential population-stabilisation-adjacent indicator in the state's recent demographic record, since it speaks directly to the historic problem of sex-selective practices that the state's early-2010s child sex ratio data had flagged as a serious concern. Sustaining this improvement, and confirming it through the NFHS-6 round, should be treated as a distinct population policy priority in its own right, separate from the more conventional fertility-rate and contraceptive-prevalence indicators that population stabilisation programmes have traditionally emphasised.

6.8 Health System Strengthening and Future Preparedness

Taken together, the preceding sections point to a health system that has made real, measurable progress on several fronts, child stunting, immunisation coverage, insurance coverage breadth, and the sex ratio at birth, while carrying forward long-standing structural weaknesses in specialist staffing, facility quality, maternal mortality, childhood anaemia, and mental health service utilisation that incremental scheme launches have not yet resolved.

Three priorities stand out for the period ahead. First, the specialist-doctor shortfall documented across Community Health Centres, in the state's own cardiology workforce along the Char Dham route, and implicitly in its mental health services, is the common thread linking the maternal mortality reversal, the pilgrim cardiac death toll, and the DMHP underutilisation problem; addressing it will require sustained rural and hill service incentives beyond the bond-service model the state already runs, given that bond enforcement alone has not stopped absenteeism, as the 2025 dismissal of 56 bond-holding doctors illustrates. Second, the substantial gap between funds approved and funds utilised, visible in the Health and Wellness Centre construction shortfall, the DMHP underspend, and the decade-long Doon Medical College delay, suggests that the state's constraint is as often administrative and project-management capacity as it is the availability of central funding. Third, the state's 2026 e-Swasthya Dham initiative offers a template that could usefully be adapted, at smaller scale, to routine health surveillance in the state's other high-altitude and hard-to-reach hill blocks, rather than remaining a pilgrimage-season-only intervention.

None of these priorities require reinventing programme design so much as closing the persistent gap between what Uttarakhand's health policies promise on paper and what its facility network, staffing levels, and fund utilisation can currently deliver on the ground, a gap this framework will return to when assessing the state's fiscal capacity for health spending in Chapter 2 and its disaster and emergency preparedness architecture in Chapter 14.

A useful discipline for future editions of this chapter would be to pair every headline coverage or scheme-launch figure with its corresponding utilisation or delivery figure, insurance families enrolled alongside empanelled hospital density per hill district, Health and Wellness Centres declared operational alongside those meeting full IPHS service standards, and DMHP budget allocated alongside DMHP budget spent, so that the state's genuine gains are not obscured by the specific points at which implementation still lags design. That pairing, more than any single new scheme, is what would let Uttarakhand's health system planning move from tracking announcements to tracking outcomes.

Chapter 7: Social Justice, Inclusion and Community Welfare

Social justice policy in Uttarakhand operates under a distinctive constraint that recurs across this chapter, the state is small in absolute population, roughly 1.20 crore as of 2026 (Census of India Net, 2026), but unusually diverse in the social groups it must serve across genuinely difficult mountain terrain. Nearly 70 percent of that population lives in rural areas (Census of India Net, 2026), meaning that welfare delivery for almost every group examined in this chapter must contend with the same hill connectivity and out migration pressures already documented in relation to schooling in Chapter 5. This chapter examines nine dimensions of that inclusion agenda in turn, Scheduled Castes, Scheduled Tribes, Other Backward Classes, gender equity, child rights, elderly welfare, disability, minority communities, and finally the beneficiary linked social security architecture that increasingly ties all of the preceding groups into a single, technology mediated delivery system. A theme that recurs across nearly every section is a widening gap between the state's genuine strength in cash transfer delivery and its comparative weakness in publishing the disaggregated, group specific outcome data that would let planners know whether that delivery is actually closing the deprivation gaps it is meant to close.

7.1 Scheduled Castes, Demographic Profile, Deprivation and Development Programmes

According to the final 2011 Census figures, Scheduled Castes account for 18.76 percent of Uttarakhand's population, a combined 1,892,516 people spread across 65 state recognised castes (Wikipedia, List of Scheduled Castes in Uttarakhand, n.d.). The Chamar, Dhusia, Jhusia and Jatav grouping is by far the largest single community within this population at 548,813 people, followed by the Balmiki community at 112,383, with numerous smaller communities such as the Bajgi, Kori, Dom and Khatik making up the remainder of a socially heterogeneous population rather than a single undifferentiated group (Wikipedia, List of Scheduled Castes in Uttarakhand, n.d.). Average Scheduled Caste literacy in the state stood at 74.4 percent according to the 2011 Census, meaningfully below the state's overall literacy rate of 78.82 percent recorded in the same census, a gap of roughly four and a half percentage points that predates, and helps explain the urgency behind, the state's subsequent literacy mission push described in Chapter 5 (Singh Uday Blog, 2026).

District level distribution matters as much as the state average, since Scheduled Caste concentration varies considerably across Uttarakhand's thirteen districts, with plains and foothill districts generally showing higher shares than the more remote high Himalayan districts, a pattern that interacts with the same hill versus valley infrastructure and connectivity disparities already discussed in relation to schooling in Chapter 5 and that will recur in relation to health access in Chapter 6. Development programming for Scheduled Castes in Uttarakhand runs through the standard national architecture, post matric and pre matric scholarships, the Special Central Assistance to the Scheduled Castes Sub Plan, and hostel and coaching support for competitive examinations, delivered through the state's Social Welfare Department in parallel with the Backward Classes Welfare Department that

administers Other Backward Classes schemes discussed in section 7.3. Because Uttarakhand's Scheduled Caste population, unlike its Scheduled Tribe population discussed next, is not concentrated in remote forest tracts but is instead dispersed across both hill and plains districts, the principal access barrier is less about physical remoteness and more about the same social exclusion and asset poverty that affects Scheduled Caste communities nationally, meaning targeted scholarship and asset creation schemes, rather than infrastructure investment alone, remain the more relevant policy lever for this group specifically.

Reservation in government employment and educational admissions follows the same broad national constitutional framework applied across states, with quotas generally tracking the community's population share, though the precise, currently applicable Uttarakhand specific reservation percentage for Scheduled Castes in state government recruitment was not confirmed in a single authoritative source reviewed for this chapter, and should be verified directly against the state's own General Administration Department orders before being cited in any binding policy document. What is clearer from the demographic data itself is that the Scheduled Caste population's rural concentration mirrors the state's own overall rural skew of roughly 70 percent, meaning that whatever gains the state achieves in rural infrastructure, discussed further in Chapters 10 and 12, will disproportionately benefit this community, making cross referencing Scheduled Caste welfare outcomes against rural infrastructure rollout an obvious candidate for the integrated outcomes dashboard recommended in section 7.9.

7.2 Scheduled Tribes, Rights, Forest Dwelling Communities and Welfare Measures

Uttarakhand's Scheduled Tribe population is both small and highly concentrated. The 2011 Census recorded 291,903 Scheduled Tribe residents, just 2.89 percent of the state's population, spread across five notified tribes, the Jaunsari at 30.37 percent of the Scheduled Tribe total, the Tharu at 31.29 percent, the Buksa at 18.51 percent, the Bhotiya at 13.39 percent, and the small Raji community at 0.24 percent (Wikipedia, List of Scheduled Tribes in Uttarakhand, n.d.). Concentration is highly uneven by district, Udham Singh Nagar recorded the highest Scheduled Tribe share at 7.49 percent of its district population, followed by Dehradun at 6.58 percent, while high Himalayan districts such as Rudrapur and Tehri Garhwal recorded Scheduled Tribe shares below 0.2 percent (Wikipedia, List of Scheduled Tribes in Uttarakhand, n.d.).

The more pressing rights question in this section concerns communities that fall outside this formally notified list altogether. The Van Gujjars, a pastoralist community estimated at 60,000 to 70,000 people who migrate seasonally with buffalo herds across the Garhwal and Kumaon forest tracts, are recognised as Other Traditional Forest Dwellers under the Scheduled Tribes and Other Traditional Forest Dwellers, Recognition of Forest Rights, Act of 2006, but implementation of that Act in Uttarakhand has been strikingly poor (Climate Diplomacy, 2026). A November 2024 monthly status report from the Union Ministry of Tribal Affairs recorded that of 6,678 individual and community forest rights claims filed in

Uttarakhand, 6,493 were rejected, leaving the Act with almost no practical effect on the ground nearly two decades after its passage (The Wire, 2025). Community leaders describe continued eviction notices around the Corbett Tiger Reserve, Rajaji National Park and the Nandhaur Wildlife Sanctuary, alongside forest fires that have grown from 922 incidents in 2002 to 41,600 in 2019, both of which threaten the grazing grounds and water sources the community depends on and helps steward through traditional water harvesting structures (Climate Diplomacy, 2026). In March 2021 the Uttarakhand High Court directed the state government to reconstitute a Van Gujjar rights committee with more competent members, and in 2022 the Van Gujjar Tribal Yuva Sangathan formally sought Scheduled Tribe status for the community, but no public update on either the committee's recommendations or the Scheduled Tribe application had been documented in the sources reviewed for this chapter (Land Conflict Watch, 2024). This combination, a near total forest rights claim rejection rate and an unresolved decade long push for formal recognition, represents one of the most significant unaddressed rights gaps in the state's entire social justice architecture, and should be read alongside the environment and forest governance discussion in Chapter 13.

The scale of this rejection is not a recent deterioration but a long standing pattern. An earlier tally, current only through November 2022, found that just 184 individual claims and a single community rights claim had been accepted out of 3,587 and 3,091 filed respectively, meaning the practical settlement rate under the Forest Rights Act in Uttarakhand has hovered near zero for years rather than months (Climate Diplomacy, 2026). This is a striking contrast with Uttarakhand's Van Panchayat system, a distinctive institution unique to the state's hill regions in which village bodies hold statutory rights to manage and use local forest resources, a system that has existed in some form since the colonial era and that in principle embodies exactly the kind of community forest stewardship the national Forest Rights Act was designed to extend to non tribal forest dwellers. The gap between a functioning, statutorily empowered Van Panchayat system for settled hill villages and a functionally dormant Forest Rights Act for the state's mobile pastoralist community suggests the barrier facing the Van Gujjars is not an absence of institutional precedent within Uttarakhand itself, but a specific unwillingness to extend recognised forest governance rights to a community whose seasonal migration pattern does not fit neatly into a village based administrative model.

7.3 Other Backward Classes, Identification, Reservation and Social Mobility

Other Backward Classes policy in Uttarakhand has been shaped less by an independent state process than by a series of central government and judicial interventions layered onto a hill state social structure that, unlike much of north India, is not OBC majority. Available demographic estimates suggest Uttarakhand's hill districts are dominated by Rajput and Brahmin communities, together often estimated at more than half the population, meaning the state's roughly 25 plus recognised OBC communities, prominently including Gurjars, Yadavs and communities such as Rai Sikh, Gorkha and Goswami, form a numerically smaller share of the population than in most other Hindi belt states (FindEasy, 2026). No official caste enumerated census has been conducted since 1931, so any state specific OBC population percentage should be treated as an estimate rather than an official figure. The Union Cabinet

approved amendments to the Central List of OBCs for Uttarakhand alongside Gujarat, correcting and including additional castes and communities to make their members eligible for reservation in central government posts, central educational institutions and central welfare schemes (Prime Minister of India, n.d.).

At the local government level, a Supreme Court order in 2022 required the state to constitute a dedicated commission, chaired by retired Justice B. S. Verma, to examine the empirical basis for OBC reservation specifically in Uttarakhand's municipal bodies, a triple test requirement the Court has applied nationally following its Rajasthan and Madhya Pradesh panchayat reservation rulings. The Verma Commission submitted its report to Chief Minister Pushkar Singh Dhami, clearing a path toward reinstating OBC reservation in urban local body elections that had been held up pending this empirical justification (Business Standard, 2024). The practical effect of this sequence, central list correction on one hand, and Supreme Court mandated local body commission on the other, is that Other Backward Classes in Uttarakhand have gained ground on paper through national policy machinery more than through a distinct state led social mobility programme, and the state's own Backward Classes Welfare Department has comparatively less independent policy visibility than its Scheduled Caste and Scheduled Tribe counterparts, an imbalance future editions of this framework should track as the Verma Commission's recommendations are implemented.

The 2019 constitutional amendment introducing a 10 percent reservation for Economically Weaker Sections among the general category, alongside the pre existing 27 percent OBC and 50 percent overall reservation ceiling upheld since the 1992 Indra Sawhney judgment, further complicates the social mobility picture for Uttarakhand's OBC population specifically, since a hill state with a comparatively small OBC population share, sitting alongside large dominant forward castes, faces a different reservation politics than the OBC majority states where the Mandal Commission's original 27 percent recommendation was calibrated. Whether Uttarakhand's own OBC communities are experiencing genuine intergenerational social mobility through education and government employment quotas, or whether reservation access remains concentrated among a narrower creamy layer within the 25 plus recognised communities, is a question that would require disaggregated, community wise outcome data the state has not published in the sources available for this chapter, again pointing to the same data transparency gap identified throughout this chapter.

7.4 Gender Equity, Women's Participation in Education, Economy and Governance

Uttarakhand's record on gender equity is genuinely mixed, strong and improving on economic participation and grassroots governance, still weak at the state legislature level. On economic participation, government data placed the female Worker Population Ratio for persons aged 15 and above in Uttarakhand at 31.6 percent in 2021 to 2022, rising to 37.0 percent in 2022 to 2023 and further to 43.7 percent in 2023 to 2024, a sustained multi year rise that outpaced the national female Worker Population Ratio increase over the same period (Directorate General of Employment, 2025). On local governance, Uttarakhand was among

the earliest states to legislate 50 percent reservation for women in Panchayati Raj Institutions, adopting the higher quota from the time of its own formation in 2000, well ahead of the constitutional minimum of one third and alongside a small group of states including Bihar, Madhya Pradesh and Himachal Pradesh (Bharatdocs, 2026). Women's civic engagement at the ballot box has also consistently outpaced men's, in the 2022 assembly election women's turnout reached 67.2 percent against 62.37 percent for men, continuing a pattern visible since at least the 2014 general election (Press Reader, Hindustan Times, 2026).

State legislature representation tells a less encouraging story. Women's presence in the Uttarakhand Legislative Assembly rose only gradually, from four women MLAs in both the 2002 and 2007 assemblies to five in 2012 and 2017, and to eight of 70 seats, or 11.4 percent, following the 2022 election (Outlook India, 2022). This places Uttarakhand's own legislature well below both the state's own panchayat level reservation commitment and below the female workforce participation gains reported above, a gap that suggests the state's genuine grassroots and economic gender gains have not yet translated into proportionate representation at the apex of state decision making, a pattern shared with most Indian state legislatures but no less significant for being common.

Nationally, the female Worker Population Ratio for persons aged 15 and above rose from 22.0 percent in 2017 to 2018 to 40.3 percent in 2023 to 2024 according to the Periodic Labour Force Survey (Ministry of Statistics and Programme Implementation, 2024), meaning Uttarakhand's own 43.7 percent figure for 2023 to 2024 placed the state modestly ahead of the national average, a genuinely creditable position for a hill state where agricultural terrain limits mechanisation and where much day to day farm and household labour has historically fallen to women while men migrate for salaried work. The National Family Health Survey 5 found that 21 percent of Uttarakhand households were headed by women as of 2019 to 2021, with 17 percent of the state's total population living in such households (DHS Program, 2025), a figure consistent with the same out migration pattern already discussed in relation to elementary and higher education enrolment in Chapter 5, and one that gives the state's high female workforce participation a specific, structural explanation, women in hill households are frequently the primary daily economic actor by necessity rather than solely by policy driven empowerment, a distinction state planners should keep in view when designing programmes intended to build on this participation rate.

7.5 Child Rights, Protection and Development, POCSO, Child Labour and Nutrition

Nationally, the National Crime Records Bureau recorded 177,335 cases of crime against children in 2023, a 9.2 percent increase over 2022, of which cases under the Protection of Children from Sexual Offences Act, or POCSO, accounted for 67,694 cases, or 38.2 percent of the total, alongside 79,884 cases of kidnapping and abduction of children, the largest single category (The News Minute, 2025). State disaggregated POCSO case figures specific to Uttarakhand were not available in the sources reviewed for this chapter, a data gap consistent with the pattern already flagged in Chapter 5 regarding Children with Special

Needs and district level ICT infrastructure, and one this framework again recommends the state close through its own annual reporting. What is documented is a serious individual case, in April 2025 the alleged sexual assault of a 12 year old girl in Nainital district led not only to a POCSO prosecution but to communal tension, vandalism of shops and a market shutdown in the town, illustrating how child protection failures in the state can escalate into broader public order concerns that fall outside the child protection system's own remit to manage (Wikipedia, 2025 Nainital child sexual assault case, n.d.).

On the institutional response side, Uttarakhand implements Mission Vatsalya, the Union Ministry of Women and Child Development's centrally sponsored child protection scheme covering Children in Need of Care and Protection and Children in Conflict with Law, under a funding arrangement in which the Centre bears 90 percent of costs and the state only 10 percent, the same favourable hill state ratio already noted for Samagra Shiksha's inclusive education component and PM SHRI schools in Chapter 5 (ClearIAS, 2026). On nutrition, the National Family Health Survey 5, conducted in 2019 to 2021, found Uttarakhand among a small group of states and union territories, alongside Puducherry, Haryana, and the union territories of Andaman and Nicobar Islands and Dadra and Nagar Haveli and Daman and Diu, where child wasting levels had nearly halved compared with the previous survey round in 2015 to 2016, a genuinely encouraging outlier against the national picture of rising severe wasting over the same period (IDR, 2025). Whether this nutrition gain and the state's own literacy and foundational learning gains discussed in Chapter 5 are mutually reinforcing, as the state's own planners would hope, or simply parallel and unconnected improvements, is a question the state's own cross sectoral monitoring, discussed further in section 7.9, should be equipped to answer.

Other indicators from the same survey round point to a more mixed picture beneath this headline wasting improvement. In Uttarakhand, only 54 percent of children aged 9 to 35 months had received a vitamin A supplement in the preceding six months, and just 41 percent of the youngest children aged 6 to 23 months living with their mother had eaten vitamin A rich foods, while only 13 percent of children in that age group had eaten iron rich foods the day before the survey, even though 18 percent had received iron supplements in the preceding week (DHS Program, 2025). This gap between supplement coverage and actual dietary diversity, supplements reaching children more reliably than iron and vitamin A rich foods do, suggests that Anganwadi and Poshan Abhiyan programming in the state has been more successful at distributing tablets and syrups than at shifting household level feeding practices, a distinction with real consequences for anaemia and stunting risk that a supplement centric monitoring framework alone would not surface. Regarding the April 2025 Nainital episode described above, the case illustrates a pattern documented in child protection literature nationally, that the identity of an accused person in a child sexual assault case can, particularly in religiously mixed districts such as those bordering Uttar Pradesh, transform a child protection matter into a communal flashpoint largely disconnected from the child victim's own welfare and recovery needs, underscoring why the child protection system's own institutional response, not just prosecution outcomes, deserves close and continued state level attention.

7.6 Welfare of Elderly Persons, Pension, Care Infrastructure and Policy

Uttarakhand's core instrument for elderly welfare is its Old Age Pension Scheme, administered by the Department of Social Welfare, which provides a monthly pension of approximately 1,500 rupees to residents aged 60 or above who fall below the poverty line or have a family income under 4,000 rupees a month, funded through a combination of the central Indira Gandhi National Old Age Pension Scheme and a state level top up (Government Schemes India, n.d.). This runs alongside parallel widow pension, disability pension, deserted women's assistance, farmer pension and the state specific Teelu Rauteli scheme for women, all channelled through a single, Aadhaar linked Direct Benefit Transfer system. In January 2026, Chief Minister Pushkar Singh Dhami personally disbursed that month's payment to 947,345 eligible beneficiaries across these combined social security pension schemes, transferring a total of approximately 141.67 crore rupees in a single one click DBT operation, with the Old Age Pension Scheme itself accounting for the largest share of beneficiaries (OB News, 2026). A separate state budget disclosure identified the Sarvajan Pension Yojana as having received the single largest scheme allocation in a recent Uttarakhand budget, at approximately 14,065 crore rupees, underscoring how central elderly and vulnerable group pensions have become to the state's overall social spending pattern (Testbook, 2026).

This pension architecture addresses income security but says less about care infrastructure, residential care facilities, geriatric health services, and caregiver support for a hill state population where adult children frequently migrate to the plains or metros for work, a pattern already noted in relation to school enrolment and higher education participation in Chapter 5. State specific data on residential elderly care capacity, day care centres under the Integrated Programme for Senior Citizens, or geriatric ward availability in district hospitals were not available in the sources reviewed for this chapter, and represent a further area where the state's welfare architecture appears stronger on cash transfer delivery than on the physical and clinical infrastructure that a rapidly ageing, migration affected hill population will need over the coming decade.

The inclusion of the Teelu Rauteli scheme, named for a celebrated Garhwali woman warrior and reserved specifically for women beneficiaries, within the same January 2026 disbursement round as the general old age and disability pensions is itself informative, it shows the state layering identity specific welfare recognition onto its generic pension architecture rather than treating elderly and vulnerable group welfare as a single undifferentiated cash transfer, an approach with genuine symbolic and political value locally even where, as with several other schemes discussed in this chapter, the precise eligibility criteria and beneficiary counts specific to that individual scheme were not separately available in the sources consulted here.

7.7 Persons with Disabilities, Rights, Accessibility and Empowerment

India's 2011 Census recorded 2.68 crore persons with disabilities nationally, and the subsequent Unique Disability Identity, or UDID, card system, intended to give every person with a disability a single portable identity for accessing welfare schemes, had by 2026 issued cards to only roughly half that counted population nationally, with more than 11 lakh applications still pending (GRAAM, 2026). Uttarakhand's own position within this national picture is not encouraging. A 2026 review of India's disability data infrastructure specifically named Uttarakhand, alongside Rajasthan, as a state that struggles with basic disability certification infrastructure, noting that the medical boards responsible for certifying disability status meet infrequently or not at all in many districts, a direct barrier to accessing the UDID card, and through it, the pension and welfare benefits discussed elsewhere in this chapter (GRAAM, 2026). The same review found that in Uttarakhand and Madhya Pradesh specifically, more than a quarter of households with a disabled member are pushed below the poverty line by disability related costs, a finding that should be read as a direct call for stronger disability pension and healthcare cost coverage rather than certification infrastructure alone (GRAAM, 2026).

On the recruitment and staffing side, as already noted in Chapter 5, the Uttarakhand Subordinate Service Selection Commission maintains a dedicated Assistant Teacher, Special Education recruitment channel whose syllabus explicitly covers the Rights of Persons with Disabilities Act, 2016, suggesting the state has built at least one specialised institutional pipeline for disability inclusive service delivery even where broader certification infrastructure lags. Reconciling these two facts, a functioning specialised teacher recruitment channel alongside an irregularly functioning medical certification system, points to a specific and addressable policy gap, strengthening the frequency and district level reach of disability assessment camps would very likely do more to improve outcomes than any single new scheme, since it is the gateway through which every other disability benefit in this section is accessed.

It is also worth noting that the Rights of Persons with Disabilities Act, 2016 itself recognises 21 distinct categories of disability, a considerable expansion from the narrower schedule in effect when Uttarakhand's own 2011 Census disability data, referenced at the start of this section, was collected. This means the state's certification and pension infrastructure discussed above is now being asked to serve a legally broader population than the one its historical baseline data describes, making the case for a fresh, RPwD Act aligned disability survey in Uttarakhand, rather than continued reliance on 2011 Census categories, considerably stronger, and directly complementary to the certification camp expansion recommended above.

7.8 Minority Communities, Development, Representation and Welfare

Uttarakhand's religious composition, per the 2011 Census, is 82.97 percent Hindu, 13.95 percent Muslim, 2.34 percent Sikh, 0.37 percent Christian, 0.15 percent Buddhist and 0.09 percent Jain (Census of India Net, 2026). The Muslim population, concentrated overwhelmingly in the plains districts bordering Uttar Pradesh, particularly Haridwar, Udham Singh Nagar and Nainital, grew by approximately 34 percent between the 2001 and 2011 Census rounds, considerably faster than the 9.3 percent growth recorded in the state's Hindu population over the same decade, a differential driven by both migration into the plains districts and fertility differentials rather than any single cause (Data Player, 2025). The state's Minority Welfare Department implements the Minority Vikas Nidhi Scheme for the state's religious minorities, Muslim, Sikh, Christian, Buddhist and Jain communities, alongside recognised linguistic minorities including Urdu, Bengali and Punjabi speaking populations, with the department's own published figures citing an aggregate religious minority population share of approximately 15.4 percent as of the 2001 Census, a figure that will have shifted further given the differential growth rates just described (Minority Welfare Uttarakhand, n.d.).

This welfare mandate now sits in some tension with a regulatory measure discussed in Chapter 5, the state's own Uttarakhand Minority Educational Institutions Bill, part of a broader national wave of action against unrecognised madrasas that saw the number of recognised madrasas nationally fall from 20,512 to 19,690 in a single UDISE+ reporting year (Careers360, 2025). As already argued in Chapter 5, a state simultaneously running a minority development scheme and tightening minority educational institution recognition needs a clearly documented mainstreaming pathway for any children displaced by the latter, since without one, the two policies risk working against each other rather than in a complementary fashion, undermining the very community development goals the Minority Vikas Nidhi Scheme is meant to serve.

Uttarakhand's minority welfare picture also sits within a broader identity of the state as a major Hindu pilgrimage destination, home to the Char Dham circuit and the periodic Kumbh Mela, an identity that shapes both the state's tourism economy, discussed in Chapter 19, and the social and political backdrop against which minority welfare and educational institution regulation decisions, such as those noted above, are made and publicly received. This context does not change the demographic or programmatic facts set out in this section, but it is relevant background for understanding why minority policy in Uttarakhand, more than in many other states, tends to attract disproportionate public attention relative to the size of the communities involved.

7.9 Social Security and Beneficiary Linked Welfare Architecture

Drawing the preceding eight sections together, a single structural feature deserves emphasis, since it cuts across nearly every population group discussed in this chapter, Uttarakhand's special category hill state status. This status entitles the state to a 90 to 10 Centre to state funding ratio, rather than the general category 60 to 40 ratio, across multiple centrally sponsored welfare schemes, Samagra Shiksha's inclusive education component discussed in

Chapter 5, PM SHRI schools also discussed in Chapter 5, and Mission Vatsalya child protection services discussed in section 7.5 of this chapter (ClearIAS, 2026). This is not a minor technical detail, it means that for a wide swathe of the social justice architecture examined here, Scheduled Tribe forest dwelling communities aside, the state's own fiscal exposure to expanding coverage is structurally lower than in most of the country, which strengthens the case for aggressive coverage expansion precisely where data gaps, rather than funding gaps, are the binding constraint.

The state's delivery mechanism has also matured into a genuinely integrated, technology enabled system, the January 2026 one click disbursement of pensions to 947,345 beneficiaries across old age, widow, disability, farmer and deserted women's schemes in a single Direct Benefit Transfer operation, described in section 7.6, demonstrates real administrative capacity to move beneficiary linked welfare payments at scale through Aadhaar linked bank accounts via the state's Samajik Suraksha and Apuni Sarkar portals (OB News, 2026). What this chapter has repeatedly found missing, however, is the disaggregated data layer sitting underneath this delivery capacity, state specific figures on Scheduled Caste programme outcomes, Van Gujjar forest rights claim resolution timelines, Assembly and panchayat gender representation trends published annually rather than reconstructed from election cycle analyses, district level POCSO case data, elderly care infrastructure capacity, disability certification camp frequency, and minority mainstreaming outcomes following educational institution deregistration. Each of these gaps recurred independently across sections 7.1 through 7.8, which suggests the underlying cause is not any single department's reporting failure but a state level data architecture that has prioritised payment delivery over outcome measurement. Extending the same technological ambition that built the one click pension disbursement system toward an integrated, publicly published social justice outcomes dashboard, cutting across all nine population groups examined in this chapter, would represent the single highest value reform available to the state's welfare administration over the remainder of this decade, and would directly complement the Vidya Samiksha Kendra model already operating in the education sector, discussed in Chapter 5, extending its logic from learning outcomes to the broader social justice mandate this chapter has traced.

Three concrete near term steps follow from this diagnosis. First, the Social Welfare, Backward Classes Welfare, Tribal Welfare and Minority Welfare Departments should agree a common, district level reporting template covering programme enrolment, disbursement and, where relevant, forest rights or educational institution mainstreaming outcomes, published on a single portal alongside the existing pension and scholarship application systems. Second, the state should commission a fresh, RPwD Act aligned disability survey rather than continue relying on 2011 Census categories, given the legal expansion of recognised disability types already noted in section 7.7.

CHAPTER 8: TRANSPORT AND CONNECTIVITY INFRASTRUCTURE

8.1 Road Network: National Highways, State Highways and Rural Roads

Uttarakhand's road network carries a strategic and developmental significance disproportionate to the state's modest size, given the combination of pilgrimage tourism, border security, and difficult mountain terrain discussed throughout this framework. Road transport remains, and is likely to remain for the foreseeable future, the dominant mode carrying the overwhelming majority of both passenger and freight movement within the state's hill districts, given that the rail expansion discussed in section 8.2 remains under construction and the state's ropeway systems, discussed in section 8.5, serve specific high value corridors rather than general purpose transport. This makes the quality, resilience, and disaster preparedness of Uttarakhand's road network a matter of foundational importance to nearly every other sector examined throughout this framework, from healthcare access discussed in Chapter 6 to agricultural marketing discussed in Chapter 18, since a hill district's effective access to markets, hospitals, and educational institutions depends overwhelmingly on the condition of the roads connecting it to those services.

The centrepiece of the state's recent road infrastructure programme is the Char Dham All Weather Road Project, involving the widening and all-weather upgrading of approximately 825 kilometres of highway connecting the four principal pilgrimage sites of Yamunotri, Gangotri, Kedarnath, and Badrinath, divided into 53 distinct construction packages (Char Dham All Weather Road Project, Press Information Bureau, 2025). As of mid-2025, approximately 629 to 640 kilometres of this scope had been completed, with the Centre informing the Supreme Court that roughly 75 per cent of the project's work had been finished, though the project's original completion target of March 2022 was substantially delayed by litigation related to forest and environmental clearances (Char Dham Project in Uttarakhand, Drishti IAS, 2026; Char Dham Project, Ajmal IAS Academy, 2025).

Given the project's location within ecologically sensitive and seismically active Himalayan terrain, discussed in Chapter 1, its implementation is monitored by two distinct Supreme Court constituted bodies, a High Powered Committee overseeing non-strategic road segments including Rudraprayag-Gaurikund and Dharasu Bend-Jankichatti, and a separate oversight committee for the project's more strategically significant segments, Rishikesh-Mana, Rishikesh-Gangotri, and Tanakpur-Pithoragarh, each of which doubles as a feeder route toward the Indo-China border (Char Dham All Weather Road Project, Press Information Bureau, 2025; Char Dham Project, Ajmal IAS Academy, 2025). This dual committee structure reflects the genuine tension this project embodies between ecological sensitivity concerns, discussed further in Chapter 14, and the strategic imperative of maintaining reliable, wide, all-weather road connectivity to India's frontier with China, a tension that came into sharper national policy focus following the 2017 Doklam standoff.

Beyond the Char Dham project, the Centre has approved a further Rs 1.30 lakh crore road infrastructure investment plan for Uttarakhand, encompassing the newly commenced Delhi-Dehradun Expressway alongside a series of state highway upgrades including the Sitarganj-Tanakpur, Paonta Sahib-Dehradun, Bhaniyawala-Rishikesh, Kathgodam-Lalkuan-Haldwani Bypass, and Rudrapur Bypass projects (Centre Launches Rs 1.30 Trillion Road Infrastructure Plan for Uttarakhand, Indian Infrastructure, 2026). This scale of investment, discussed further in the capital expenditure context of Chapter 2, reflects the sustained national policy prioritisation Uttarakhand's road network has received given the state's dual significance for pilgrimage tourism, discussed in Chapter 19, and national border security, a combination of priorities that few other Indian states' road networks are simultaneously required to serve.

The Delhi-Dehradun Expressway carries particular economic significance beyond its immediate connectivity benefit, since it is expected to substantially reduce travel time between the National Capital Region and Uttarakhand's capital, strengthening the kind of economic integration between Dehradun and Delhi that has already benefited Rajasthan's own National Capital Region adjacent districts, discussed in comparative state analysis elsewhere in this framework series, and creating the potential for Dehradun and its surrounding industrial belt to capture a greater share of the National Capital Region's overspill investment and residential demand. At the same time, road safety and disaster resilience considerations discussed in Chapter 14 mean that Uttarakhand's road expansion cannot be evaluated purely on connectivity and travel time grounds, since roads constructed or widened without adequate slope stabilisation, drainage, and landslide mitigation engineering risk becoming sites of exactly the kind of infrastructure failure that has repeatedly affected the state's mountain highways during monsoon seasons, discussed further in the disaster risk profile examined in Chapter 14.

Rural road connectivity beyond the state's flagship national highway and Char Dham projects continues to depend substantially on the Pradhan Mantri Gram Sadak Yojana, extending all-weather road access to the state's more remote hill villages in a manner directly analogous to the rural connectivity challenges documented in other mountainous and hill dominant Indian states. Given the outmigration pressures discussed throughout Chapter 1, the case for continued investment in rural hill road connectivity extends beyond simple transport access to encompass a genuine strategy for sustaining village viability, since improved road access can materially affect a hill household's decision whether to remain in or depart from a home village, connecting this section's infrastructure focus directly to the demographic and rural development themes examined in Chapters 1 and 12.

8.2 Railways: Existing Network, Pending Projects and Expansion Proposals

Uttarakhand's rail connectivity has historically been concentrated in the state's plains districts, with Haridwar and Dehradun serving as the principal rail gateways connecting the state to the national network, while the state's mountainous Garhwal and Kumaon hill districts have remained almost entirely without rail access, a gap that stands in sharp contrast to the road and, increasingly, aviation connectivity the same hill districts have received, discussed in

sections 8.1 and 8.3. This absence of rail access to the hill districts has historically meant that all passenger and freight movement beyond the plains gateway towns has depended entirely on road transport, a dependence that both elevates transport costs and travel times relative to what rail connectivity would offer, and increases the hill districts' vulnerability to the landslide and weather related road disruptions discussed in the disaster risk context of Chapter 14, since a single road blockage can sever a hill district's only connection to the outside world in a way that would not occur in an area served by an alternative rail route.

The Rishikesh-Karnaprayag Rail Project represents the most significant effort to date to extend this rail network into the hill districts, comprising a 125 kilometre broad-gauge single track alignment incorporating 16 tunnels and 12 stations, sanctioned in 2016 and designed to reduce travel time between Rishikesh and Karnaprayag from approximately seven hours by road to just over two hours by rail (Rishikesh-Karnaprayag Railway: 2026 Construction Update, Railway News, 2025).

As of the Ministry of Statistics and Programme Implementation's monthly project monitoring flash report for October 2025, the project had achieved 72 per cent physical progress, with approximately Rs 26,841 crore spent of a total estimated project cost of Rs 38,953 crore (Uttarakhand's Rishikesh-Karnaprayag Rail Project Hits 72 Per Cent Physical Progress, Swarajya, 2026). Rail Vikas Nigam Limited has revised the project's expected completion timeline to December 2028, extending the earlier target of late 2026, a revision officials attribute to the genuine scale and geological complexity of tunnelling through active Himalayan terrain, even as the project continues to target December 2026 for breakthroughs in its remaining tunnel sections, including India's longest railway tunnel, Tunnel T-8, between Devprayag and Janasu, which achieved a major breakthrough during 2025 (Uttarakhand's Rishikesh-Karnaprayag Rail Project Hits 72 Per Cent Physical Progress, Swarajya, 2026; Char Dham Railway Project, e-Uttaranchal, 2026).

This Rishikesh-Karnaprayag line forms the first phase of a considerably larger planned Char Dham Railway network, encompassing a subsequent Karnaprayag-Saikot-Sonprayag Kedarnath Railway extension of 99 kilometres and a Saikot-Joshimath Badrinath Railway extension of 75 kilometres, intended eventually to connect rail access directly to within a short distance of both Kedarnath and Badrinath (Char Dham Railway Project, e-Uttaranchal, 2026). Chief Minister Pushkar Singh Dhami has separately secured the Central Government's approval for a further Rs 48,000 crore Tanakpur-Bageshwar rail line project extending rail connectivity into the Kumaon region, with the project's survey and detailed project report completed, while also requesting the Railway Board to advance the Karnaprayag-Bageshwar and Kichha-Khatima linkages to support balanced regional development across the state's hill and plains districts alike (Uttarakhand Seeks Timely Completion of Rishikesh Karnaprayag Rail, Construction World, 2026). Eleven of the state's railway stations are additionally being redeveloped under the national Amrit Bharat Station Scheme, extending modernisation benefits beyond the state's new rail line construction to its existing station infrastructure as well.

The repeated revision of the Rishikesh-Karnaprayag project's completion timeline, from an original target within the 2016 sanction period, through successive announcements of late 2025, then end of 2026, and now December 2028, illustrates a broader lesson relevant to infrastructure planning across Uttarakhand's mountainous terrain, discussed throughout this chapter: tunnelling and construction timelines in genuinely active Himalayan geology are inherently difficult to forecast with the precision that infrastructure planning in flatter terrain typically allows, given the risk of unexpected geological conditions, water ingress, and rock instability that can each independently extend construction timelines by months or years beyond initial engineering estimates. This pattern of timeline revision is not unique to the Rishikesh-Karnaprayag project specifically but reflects a structural feature of major infrastructure delivery in the state that policymakers, discussed in the fiscal planning context of Chapter 2, should explicitly build into their budgeting and public communication around future large-scale hill infrastructure projects, rather than treating each individual project's delay as an isolated implementation failure.

Strategically, the completion of this expanding rail network carries significance extending well beyond tourism and pilgrimage access alone, since improved rail connectivity to Uttarakhand's border facing Garhwal districts directly supports the national defence logistics imperative discussed in the road network context of section 8.1, providing an alternative, potentially more resilient transport mode for moving personnel and materiel toward the frontier with China during periods when mountain roads may be compromised by landslides, snow, or other seasonal disruption, a redundancy consideration of genuine strategic value given the state's position along an actively contested and militarily significant international frontier.

8.3 Aviation: Airport Infrastructure and Air Connectivity

Uttarakhand's aviation infrastructure is anchored by five airports serving distinct regions of the state, a network that has expanded and modernised considerably over the past several years in tandem with the state's growing tourism, pilgrimage, and business travel demand discussed throughout this framework. Jolly Grant Airport, officially Dehradun Airport, located approximately 25 kilometres southeast of Dehradun, serves as the state's primary aviation gateway, connecting travellers to Dehradun, Rishikesh, Haridwar, Mussoorie, and the broader Char Dham pilgrimage circuit through regular daily flights from Delhi, Mumbai, and other major Indian cities (Dehradun Airport, Jolly Grant, UttarakhandTrip, 2026). Pantnagar Airport, located in Udham Singh Nagar district, serves as the sole airport for the Kumaon region, connecting visitors to Nainital, Ranikhet, Jim Corbett National Park, Bhimtal, and Almora, while Gauchar Airport in Chamoli district, situated on the Badrinath Highway and operated by the Indian Army, played a critical role in the rescue of stranded pilgrims following the 2013 Kedarnath floods discussed in Chapter 14, and continues to support helicopter services for the Char Dham circuit alongside its military functions (List of 5 Airports in Uttarakhand, Holidify, 2026).

Naini Saini Airport in Pithoragarh serves the state's easternmost Kumaon border districts, located adjacent to a Defence Agriculture Research Laboratory, underscoring the dual civilian

and strategic significance that characterises much of Uttarakhand's aviation infrastructure given the state's international frontier position discussed in Chapter 1. Airport expansion works have proceeded with central government assistance at Jolly Grant, Pantnagar, and Pithoragarh, reflecting sustained national investment priority in strengthening the state's fixed wing aviation capacity alongside its road and rail connectivity investments discussed in sections 8.1 and 8.2 (Uttarakhand Development Projects Worth Rs 2 Lakh Crore, The News Mill, 2026).

Helicopter connectivity has expanded particularly rapidly under the central government's UDAN regional connectivity scheme, with 18 heliports under development across the state, of which 12 are already operational, connecting cities including Gauchar, Srinagar, Chinyalisaur, Haldwani, Munsyari, Pithoragarh, Pantnagar, Champawat, Bageshwar, Nainital, and Almora (Uttarakhand Development Projects Worth Rs 2 Lakh Crore, The News Mill, 2026). The number of operational heliports in the state has grown from just two in 2022 to seven, while the broader network of helipads, supporting both scheduled UDAN services and the substantial charter helicopter market serving Char Dham pilgrims discussed in Chapter 19, has expanded from 60 in 2021-22 to 118, representing one of the most rapid helicopter infrastructure expansions of any Indian state and reflecting the particular value of vertical lift aviation in a terrain where fixed wing airport construction remains constrained by limited flat land availability.

This rapid helicopter infrastructure growth reflects a pragmatic recognition within the state's aviation planning that conventional fixed wing airport development, requiring substantial flat land for runways that Uttarakhand's mountainous terrain rarely provides outside its plains districts, cannot alone meet the connectivity demands of a state whose most economically and religiously significant destinations, the Char Dham shrines themselves, are located at high altitude sites where runway construction is simply not feasible. Helicopter services connecting pilgrims directly from Dehradun's Sahastradhara helipad to each of the four Char Dham sites, discussed further in the tourism infrastructure context of Chapter 19, have consequently become an increasingly mainstream, rather than niche luxury, transport option for pilgrimage tourism, particularly for elderly pilgrims and those with limited time or physical capacity for the multi-day trekking or road travel that reaching these high altitude shrines has traditionally required.

Aviation safety and weather reliability considerations remain a persistent operational challenge for this expanding helicopter network, given the genuinely difficult and rapidly changing mountain weather conditions across the Char Dham region, discussed further in the climate vulnerability context of Chapter 14, meaning that helicopter service reliability during the peak pilgrimage season remains subject to periodic weather related disruption regardless of the underlying infrastructure investment discussed in this section. Continued investment in weather forecasting and flight safety infrastructure specific to the state's helicopter operators, alongside the physical heliport and helipad expansion documented above, represents an essential complementary priority for ensuring that this rapidly growing aviation mode delivers safe and reliable service consistent with the scale of investment now flowing into it.

8.4 Ports, Inland Waterways and Logistics Hubs

Uttarakhand, as an entirely landlocked Himalayan state, possesses no maritime port infrastructure and no coastline, a geographic reality that shapes the state's freight logistics strategy fundamentally differently from India's coastal states. Unlike states with extensive canal networks or navigable plains rivers, Uttarakhand's own river systems, the Ganga and Yamuna at their headwaters discussed in Chapter 1, flow through steep, rocky, and rapidly descending mountain terrain for the great majority of their course within the state, rendering them entirely unsuitable for navigation or freight transport despite their considerable hydrological and religious significance, a distinction from Rajasthan's canal-based irrigation logistics or the historically navigable stretches of the Ganga further downstream in Uttar Pradesh, Bihar, and West Bengal.

This complete absence of waterway based logistics options within the state's own boundaries means that Uttarakhand's freight and passenger transport economy has developed along a fundamentally different trajectory to that of India's major river states, one where road and, increasingly, rail infrastructure, discussed in sections 8.1 and 8.2, must independently bear the full logistics burden that would otherwise be shared with inland water transport in a plains river state. This structural feature of the state's geography should inform how policymakers benchmark Uttarakhand's logistics performance against other Indian states, since comparisons that do not account for this fundamental waterway absence risk understating the genuine infrastructure achievement represented by the state's road and rail investment discussed throughout this chapter, or conversely overstating the ease with which the state could further reduce its logistics costs without the waterway option available to many of its peer states.

Consequently, Uttarakhand's logistics and freight movement strategy depends entirely on road and rail infrastructure, discussed in sections 8.1 and 8.2, with the state's principal logistics and dry port style facilities concentrated in its plains industrial belt around Haridwar, Dehradun, and Udham Singh Nagar, where the state's substantial pharmaceutical and manufacturing sector, discussed in Chapter 4, generates significant outbound freight volume requiring efficient connection to national and international markets. These plains logistics hubs benefit from proximity to the broader National Capital Region's freight and logistics infrastructure, allowing Uttarakhand's manufacturers to access Delhi's air cargo facilities and the wider network of dry ports and container depots serving northern India without requiring dedicated port infrastructure of the state's own.

This complete dependence on road and rail freight movement, without any waterway alternative, means that Uttarakhand's logistics cost structure is likely to remain structurally higher than that of states able to shift at least a portion of their bulk freight onto lower cost waterway transport, a disadvantage the state's manufacturers must offset through other competitiveness levers, including the tax incentives and industrial policy measures discussed in Chapter 4, if the state's pharmaceutical and manufacturing exports are to remain price competitive against production located in states with more diversified logistics options. This structural logistics cost disadvantage is partially offset by Uttarakhand's genuine proximity

advantage relative to the National Capital Region market, discussed in section 8.1, since manufacturers located in the state's Haridwar and Udham Singh Nagar industrial belt can reach Delhi's consumption and distribution markets over considerably shorter road and rail distances than manufacturers located in India's more distant industrial states, a locational advantage that meaningfully compensates for the absence of waterway freight alternatives.

Given the absence of any waterway or port based logistics option, strengthening rail freight capacity specifically, rather than relying predominantly on road based freight movement, represents a particularly important strategic priority for Uttarakhand's industrial competitiveness, since rail freight typically offers meaningfully lower per-tonne transport costs than road freight over the medium and long distances involved in moving the state's manufactured and agricultural output to national and export markets, a consideration that adds further economic rationale, beyond the pilgrimage and border security considerations discussed in sections 8.1 and 8.2, for the state's continued rail network expansion.

Cold chain and agricultural logistics infrastructure represents a further specific dimension of Uttarakhand's logistics hub development, given the state's significant horticultural output, discussed in Chapter 18, concentrated substantially in the plains and foothill districts where perishable produce requires rapid, temperature controlled transport to reach distant urban markets before spoilage. Expanding dedicated cold chain logistics capacity within the state's existing plains industrial belt, integrated with the broader dry port and freight infrastructure discussed above, would allow Uttarakhand's horticultural producers to access higher value distant urban markets currently difficult to reach profitably given existing post-harvest logistics constraints, a priority this framework connects directly to the agricultural marketing discussion in Chapter 18.

8.5 Urban Mass Transit: Metro, Bus Rapid Transit and Integrated Mobility

Unlike several larger Indian states, Uttarakhand has not yet developed a formal metro rail or dedicated Bus Rapid Transit system within any of its cities, with urban public transport across Dehradun, Haridwar, and the state's other urban centres continuing to rely substantially on conventional city bus services and a large informal and semi-formal network of shared auto-rickshaws and taxis. Given Dehradun's position as the state capital and its rapidly growing population, discussed in Chapter 1, the absence of a dedicated mass transit system represents a growing urban mobility gap, particularly as the city's role as an education, tourism, and increasingly knowledge economy hub, discussed in Chapters 5 and 17, continues to draw in-migration from both the state's hill districts and neighbouring states.

This gap carries increasing practical significance given Dehradun's specific traffic congestion challenges, since the city's historic core, narrow arterial roads inherited from a much smaller colonial era hill station, and rapidly growing vehicle ownership have together produced congestion levels that a purely bus and informal transport based system struggles to manage efficiently during peak periods. The Delhi-Dehradun Expressway discussed in section 8.1, while improving inter-city connectivity considerably, will likely further increase inbound vehicle volume into Dehradun itself unless complemented by genuine intra-city mass transit

capacity capable of absorbing this growing travel demand without channelling all of it onto the city's existing, already congested road network. This suggests that the state's urban transport planning priorities should not be considered in isolation from its inter-city highway investment, since improved inter-city connectivity that is not matched by adequate intra-city distribution capacity risks simply relocating congestion from highway corridors to urban arterial roads rather than genuinely resolving it.

Ropeway infrastructure has emerged as a genuinely distinctive and increasingly significant urban and inter-city mass transit solution specifically suited to Uttarakhand's mountainous terrain, developed under the central government's Parvatmala scheme, which is expanding ropeway connectivity across several of the state's most heavily trafficked pilgrimage and tourism corridors. Current and planned ropeway projects include routes connecting Ranibagh to Nainital, Panchkoti to New Tehri, Khaliyatop to Munsyari, Har Ki Pauri to Chandi Devi Temple, Rishikesh to Neelkanth Mahadev, and Auli to Gorson, with further ropeways planned connecting Gaurikund to Kedarnath Dham and Govindghat to Hemkund Sahib (Uttarakhand Development Projects Worth Rs 2 Lakh Crore, The News Mill, 2026). These ropeway projects serve a genuinely dual mass transit function, simultaneously reducing road congestion and vehicular emissions on the state's most heavily used pilgrimage and hill station access routes, discussed further in the environmental context of Chapter 13, while dramatically reducing travel time for both pilgrims and tourists relative to conventional road access along the state's often congested and landslide prone mountain highways.

This ropeway based approach to mass transit represents a genuinely innovative adaptation to Uttarakhand's specific terrain constraints, offering a mass transit solution considerably more feasible to construct across steep mountain gradients than conventional rail or road based rapid transit infrastructure would be, and one that other Himalayan and hill states have observed with considerable interest as a potential model for their own mountain mass transit challenges. The Ranibagh to Nainital ropeway carries particular relevance for urban congestion management specifically, since Nainital's historic lake town core, much like Dehradun's, suffers from severe seasonal traffic congestion during peak tourist periods, discussed further in Chapter 19, and a ropeway connection bypassing the town's congested approach roads offers a genuinely practical congestion relief mechanism rather than merely an additional tourist attraction in its own right.

Extending this ropeway based mass transit approach into Dehradun's own urban transport network, potentially connecting outlying residential areas to the city centre across sections of challenging terrain, represents an underexplored opportunity that the state's Urban Development Department has not yet pursued at the scale its success in the pilgrimage tourism context might suggest is warranted. Given the comparatively lower construction cost and shorter implementation timeline typically associated with ropeway systems relative to conventional metro rail, discussed in the comparative infrastructure cost context of Chapter 11, a modest pilot ropeway connection within Dehradun itself, linking a congested outlying residential area to the city's central business district, could offer valuable proof of concept for whether this pilgrimage tested technology can be successfully adapted to genuine daily

commuter urban transport demand rather than the more seasonal, tourism driven demand pattern the state's existing ropeway projects have so far been designed to serve.

8.6 Multimodal Logistics: Last-Mile Connectivity and Freight Corridors

Uttarakhand's multimodal logistics strategy centres on integrating the state's expanding road network, discussed in section 8.1, its growing rail infrastructure, discussed in section 8.2, and its innovative ropeway mass transit systems, discussed in section 8.5, into a coherent system capable of serving the state's three distinct and, in several respects, competing transport demands: pilgrimage and tourism visitor movement, discussed extensively in Chapter 19, industrial and agricultural freight movement connecting the plains industrial belt to national markets, discussed in section 8.4, and border area strategic logistics supporting national security requirements along the frontier with China and Nepal, discussed in Chapter 1.

These three demand categories do not always align neatly with one another in their infrastructure requirements, creating genuine planning trade-offs that the state's transport authorities must navigate explicitly rather than assume away. Pilgrimage and tourism traffic peaks sharply during specific seasonal windows, principally the summer Char Dham Yatra season discussed in Chapter 19, requiring infrastructure capacity that may sit substantially underutilised for much of the remainder of the year, whereas industrial freight movement generates more consistent, year round demand that benefits from reliable, predictable transport capacity rather than infrastructure primarily scaled to accommodate seasonal pilgrimage peaks. Border area strategic logistics, meanwhile, requires infrastructure resilience and redundancy considerations, discussed in section 8.2, that may not always align with the pure cost efficiency logic that would otherwise guide civilian transport infrastructure investment decisions, since strategic infrastructure must remain functional even during periods of severe weather or partial network disruption when purely commercial transport demand might not justify the same level of redundant capacity.

The completion of the Rishikesh-Karnaprayag rail line, discussed in section 8.2, will fundamentally reshape last-mile connectivity planning for the state's central Garhwal hill districts, since rail access to Karnaprayag will require a correspondingly well planned network of connecting roads, ropeways, and helicopter services to carry pilgrims and freight onward from the rail terminus to the more remote Char Dham sites and surrounding hill villages that the rail line itself does not directly reach. Ensuring that this last-mile connectivity infrastructure, discussed throughout sections 8.1, 8.3, and 8.5, is developed in parallel with rather than substantially after the rail line's own completion will be essential to realising the full economic and pilgrimage access benefits the Rishikesh-Karnaprayag project is intended to generate, avoiding a scenario in which pilgrims and freight reach Karnaprayag efficiently by rail only to face the same congested, landslide prone road bottlenecks beyond that point which the rail project was specifically designed to bypass.

Institutional coordination across the multiple central ministries and state departments responsible for the individual transport modes discussed throughout this chapter, the Ministry of Road Transport and Highways and National Highways Authority of India for road

infrastructure, the Ministry of Railways and Rail Vikas Nigam Limited for rail projects, the Ministry of Civil Aviation for airport and UDAN heliport development, and the state's own Public Works Department and Urban Development Department for local roads and ropeway integration, represents a further practical challenge to achieving the genuinely integrated multimodal planning this section advocates. Establishing a dedicated state level multimodal transport coordination body, with explicit authority to align the sequencing and last-mile integration of projects being separately funded and implemented by these different central and state agencies, would represent a meaningful institutional innovation for Uttarakhand, addressing a coordination gap that has historically affected infrastructure delivery across most Indian states but which carries particularly acute consequences in Uttarakhand's specific terrain, where the absence of well planned last-mile connectivity can leave an otherwise excellent piece of trunk infrastructure, whether a rail line, highway, or airport, delivering only a fraction of its potential connectivity benefit.

This coordination challenge is compounded by the sheer scale of concurrent infrastructure activity currently underway across the state, discussed throughout this chapter, spanning the Char Dham road widening programme, the expanding Char Dham railway network, the Delhi-Dehradun Expressway, the UDAN heliport rollout, and the Parvatmala ropeway programme, each proceeding on its own funding and implementation timeline under different central ministries with limited formal mechanism for joint sequencing decisions. A state government genuinely committed to maximising the connectivity return on this unusually large simultaneous infrastructure investment would benefit considerably from establishing exactly this kind of dedicated coordination capacity, potentially housed within or closely linked to the state's own planning apparatus, ensuring that decisions such as where to prioritise last-mile road connectivity from a new rail terminus, or which ropeway corridors to prioritise relative to complementary road upgrades, are made with full visibility of the complete, cross-modal infrastructure picture rather than within the more siloed decision making that separate ministry led project implementation otherwise tends to produce.

Looking forward, integrating the state's Char Dham Railway network expansion, its All Weather Road project, its rapidly growing helicopter and ropeway infrastructure, and its plains based industrial logistics hubs into a single, coherently planned multimodal transport strategy, rather than allowing each mode to be planned and funded through separate central schemes with limited cross-coordination, represents the most significant unrealised opportunity within Uttarakhand's transport sector. Such integration would allow the state to maximise the returns on the exceptionally large scale of central government transport investment currently flowing into the state, discussed throughout this chapter, ensuring that road, rail, ropeway, and aviation investments reinforce rather than merely duplicate one another's connectivity benefits across the state's genuinely challenging and disaster prone mountain geography, a theme this framework returns to in the disaster risk reduction discussion of Chapter 14 and the long-term infrastructure financing strategy discussed in Chapter 21.

Chapter 9: Energy, Power and Renewable Transition

Uttarakhand's energy profile is defined by a single geological fact, the state sits at the head of the Ganga and Yamuna river systems in the central Himalaya, giving it hydropower potential that few other Indian states can match, alongside a fragility that the same mountains impose on every project built to harness that potential. Nearly 86 percent of the state's total area of 53,483 square kilometres is hilly terrain and roughly 65 percent is under forest cover, a combination that shapes every dimension of energy policy examined in this chapter, from the cost of extending distribution lines to remote hamlets to the physical vulnerability of large hydropower installations sited along steep, glacier fed river valleys (Springer Nature, 2021). This chapter examines six dimensions of the state's energy sector in turn, installed generation capacity and its dependence profile, transmission and distribution infrastructure, rural and household electrification, renewable energy potential across solar, wind, hydro and biomass, energy efficiency and demand side management, and finally the regulatory and tariff framework that governs how all of the above is priced and delivered to consumers.

9.1 Power Generation, Installed Capacity, Mix and Dependence Profile

Uttarakhand's total installed electricity generation capacity stood at 4,203 megawatts as of 31 March 2023, with a generation capacity allocation of 4,092 megawatts as of October 2022 broken down as 2,095 megawatts, or 51.2 percent, from hydropower, 520 megawatts, or 12.7 percent, from natural gas, 512 megawatts, or 12.5 percent, from coal, 933 megawatts, or 22.8 percent, from small hydro, wind and solar combined, and 31 megawatts, or 0.77 percent, from nuclear sources (Asian Development Bank, 2023). Separately, the state's total hydropower capacity, including large projects that feed the national grid rather than only state allocated generation, has been reported at 3,855 megawatts, of which about 46 percent, or 1,760 megawatts, is exported to neighbouring states, reflecting Uttarakhand's role as a net power exporting hill state rather than a purely self sufficient one (Asian Development Bank, 2023). This dependence on hydropower is not close to fully utilising the state's underlying resource, Uttarakhand's total hydropower generation potential has been estimated at approximately 25 gigawatts, of which about 18 gigawatts could come from new plants of 25 megawatts capacity or larger, meaning the state has developed only a modest fraction of its theoretical hydro potential despite already being one of India's most hydropower dependent states (Asian Development Bank, 2023). It is worth noting that the remaining, non hydro share of the state's own generation allocation, the 512 megawatts of coal and 520 megawatts of natural gas capacity that together make up roughly a quarter of allocated generation, does not correspond to any domestic coal or gas reserve within Uttarakhand itself, since the state has neither, meaning this fossil share represents allocated capacity at plants located elsewhere in the national grid or fuel transported into the state, a further respect in which Uttarakhand's energy security is more interdependent with the rest of the national grid than its hydropower rich reputation might suggest in isolation.

The state owned Uttarakhand Jal Vidyut Nigam Limited, or UJVNL, is the primary vehicle for expanding this capacity, having grown its own installed base from 1,317.96 megawatts in

2017 to 2018 to 1,420 megawatts in 2022 to 2023, with a stated ambition to reach 6.27 gigawatts by 2025 and 7.64 gigawatts by 2030 through a pipeline that includes the 300 megawatt Lakhwar hydroelectric project, expected to be commissioned by December 2027, and the 660 megawatt Kishau multipurpose project, a joint venture with the Himachal Pradesh government expected to be commissioned by March 2028 (Power Line Magazine, 2023). In the year 2021 to 2022, UJVNL's hydropower stations generated 5,157.27 million units against a target of 4,837 million units, an over performance of roughly 8.5 percent that illustrates the genuine operational strength of the state's existing hydro fleet even as its expansion pipeline runs years behind the company's own 2025 and 2030 capacity targets (Power Line Magazine, 2023).

This heavy hydropower dependence carries a risk dimension that state energy planning documents do not always foreground with the seriousness the record justifies. On 7 February 2021, a rock and ice avalanche originating near the Nanda Devi National Park triggered a flash flood down the Rishi Ganga and Dhauliganga valleys in Chamoli district that completely destroyed the 13.2 megawatt Rishiganga Hydropower Project and severely damaged the under construction 520 megawatt Tapovan Vishnugad project being built by the state owned National Thermal Power Corporation, killing more than 200 people, many of them workers trapped inside project tunnels, and causing an estimated 250 million United States dollars in damage to the two facilities alone (International Centre for Integrated Mountain Development, 2021; Khanal et al., 2022). The disaster, following an earlier and even more destructive flood in the same broader region in 2013, has become a widely cited case study for questioning whether the pace of hydropower infrastructure development in the fragile central Himalaya has outrun the state's capacity to assess and manage glacial and geological risk, a question this framework's Chapter 14 discussion of disaster risk and Chapter 13 discussion of environmental governance should be read alongside this energy chapter rather than in isolation from it.

Ownership of Uttarakhand's hydropower fleet is mixed rather than purely state controlled. Of the state's 86 existing hydropower projects, with a combined installed capacity of close to 3,600 megawatts, at least 11 projects, with a combined capacity exceeding 503 megawatts, sit in the private sector, alongside central sector projects operated by companies such as the National Thermal Power Corporation and state sector capacity developed by UJVNL itself (Sanctuary Nature Foundation, n.d.). This three way ownership structure, state, central and private, means that Uttarakhand's own energy security depends on coordination across regulatory jurisdictions that the state alone does not fully control, a structural feature worth bearing in mind whenever the state sets its own capacity expansion targets. A further seasonal dimension compounds this dependence profile, run of the river hydropower generation, which dominates the state's fleet, varies considerably between the high flow monsoon months and the low flow winter and pre monsoon period, meaning a state that is a substantial net power exporter in summer can face materially tighter domestic supply margins in winter, a seasonal asymmetry that the aggregate annual capacity and generation figures reported above do not by themselves reveal, and one the state's own power procurement planning, addressed further in section 9.6, needs to manage explicitly rather than through annual averages alone.

Recognising both this seasonal variability and the underlying climate risk discussed above, the state has partnered with the Asian Development Bank on a Climate Resilient Power System Development Project explicitly designed to strengthen the resilience of Uttarakhand's transmission and generation infrastructure against the kind of extreme weather and glacial hazard events the Chamoli disaster represents, rather than treating climate adaptation as a separate workstream from ordinary capacity expansion (Asian Development Bank, 2023). The existence of a dedicated, internationally financed climate resilience project for the power sector specifically is itself an acknowledgement, at the highest planning level, that Uttarakhand's hydropower led generation strategy cannot be pursued on conventional engineering and financing terms alone, and that resilience investment needs to be budgeted alongside, rather than after, capacity expansion, a sequencing question this framework's Chapter 14 disaster risk reduction discussion returns to directly.

9.2 Transmission and Distribution, Infrastructure, Losses and Reliability

The Uttarakhand Power Corporation Limited, or UPCL, is the state's principal distribution utility, and its own published data show a genuinely sustained improvement in Aggregate Technical and Commercial, or AT&C, losses over the past five reporting years, falling from 17.79 percent in 2020 to 2021 to 15.75 percent in 2021 to 2022, 15.25 percent in 2022 to 2023, 14.64 percent in 2023 to 2024 and 14.55 percent in 2024 to 2025 (Pioneer Edge, 2025). UPCL's managing director attributed this trend to infrastructure investment, including the installation of more than 90,000 distribution transformers on its feeders and the ongoing rollout of smart meters across 2,602 feeders intended to improve energy accounting, even as the utility acknowledged that power demand in the state has grown by roughly 10 percent in recent years, a pace of demand growth that tends to work against loss reduction efforts by adding new, harder to monitor connections faster than metering infrastructure can be upgraded (Pioneer Edge, 2025).

This improvement should be read against both a national benchmark and the state's own regulatory targets. The Revamped Distribution Sector Scheme, the Centre's primary financing vehicle for distribution loss reduction, aims to bring AT&C losses to a pan India level of 12 to 15 percent by 2025 to 2026 (Ministry of Power, Press Information Bureau, n.d.), meaning UPCL's 14.55 percent figure for 2024 to 2025 already sits within the lower half of this national target band, a genuinely creditable position relative to larger, plains based discoms that continue to report losses in excess of 25 to 30 percent. The scheme itself, running from 2021 to 2022 through its scheduled 2025 to 2026 sunset, links central funding release directly to results and reforms rather than disbursing capital grants unconditionally, financing prepaid smart metering and distribution infrastructure upgrades under one component and training and capacity building under a second, with the state level release of funds contingent on UPCL meeting pre qualifying criteria the national nodal agencies verify before evaluation (Ministry of Power, Press Information Bureau, n.d.). UPCL's own smart metering rollout across 2,602 feeders should therefore be read as much as compliance with this results linked national financing structure as an independent state initiative, a distinction relevant to how sustainably the state can be expected to continue this pace of infrastructure investment once

the scheme's central funding window closes. Looking forward, the Uttarakhand Electricity Regulatory Commission's Multi Year Tariff order dated 11 April 2025 has approved a loss trajectory under which UPCL is expected to bring its distribution loss level down to 12.25 percent by 2026 to 2027, a target embedded in the Commission's most recent tariff petition proceedings, which also project a total revenue gap for UPCL of approximately 2,036.99 crore rupees for 2024 to 2025 including truing up adjustments (Uttarakhand Electricity Regulatory Commission, 2025). The persistence of a revenue gap of this scale alongside genuinely falling technical losses suggests UPCL's remaining financial stress is now concentrated more in tariff design, power purchase cost recovery and collection efficiency than in the physical network losses that dominated the utility's challenges a decade ago, a distinction the state's own tariff policy, discussed further in section 9.6, needs to address directly rather than through continued network investment alone.

This distinction matters directly for consumers, since Aggregate Technical and Commercial losses combine two quite different problems, technical losses arising from the physical inefficiency of transmitting and transforming electricity across long hill feeders, and commercial losses arising from billing gaps, meter inaccuracy and non payment. UPCL's own smart metering rollout across 2,602 feeders targets the commercial half of this equation directly, since smart meters make provisional or estimated billing, a practice that Uttarakhand's own regulator has criticised in the past for masking the true scale of collection shortfalls, considerably harder to sustain. Whether the state's continued AT&C loss reduction over the next tariff cycle comes primarily from further technical upgrades or from this commercial and billing discipline will determine whether the benefit flows mainly to UPCL's own balance sheet, through better cost recovery, or to consumers, through lower cross subsidy surcharges and a narrower revenue gap for the Commission to close through tariff increases, making the composition of future loss reduction, not simply its headline percentage, the metric worth tracking in subsequent editions of this framework.

9.3 Rural and Household Electrification, Coverage and Quality

Uttarakhand's rural electrification story predates and largely concluded before the most recent national push. Under the Pradhan Mantri Sahaj Bijli Har Ghar Yojana, or Saubhagya, launched nationally in September 2017 to connect all willing unelectrified households, government statements from November 2018 identified Uttarakhand, alongside Maharashtra, Himachal Pradesh, Arunachal Pradesh and Chhattisgarh, as a state left with only a small number of unelectrified households and expected to achieve saturation imminently, in contrast to states such as Uttar Pradesh and Bihar that still had lakhs of households awaiting connection at that stage (Hindustan Times, 2018). This places Uttarakhand among the states that reached effectively universal household electrification early in the Saubhagya rollout, helped by the scheme's specific provision for standalone Solar Photovoltaic systems in remote and inaccessible villages and habitations where conventional grid extension is not technically or economically feasible, a provision of direct relevance to a state where a meaningful share of settlements sit at altitudes and in terrain that make grid connection

considerably more expensive per household than in the plains (Ministry of Power, Press Information Bureau, n.d.).

Coverage, however, is not the same as quality, and this is precisely where the chapter's now familiar data transparency gap reappears. A household counted as electrified under Saubhagya's own historical village level definition needed only a fraction of homes connected plus a handful of public buildings, a standard that says nothing about voltage stability, hours of daily supply or the frequency of outages that hill households, especially those served by long, single feeder lines to remote hamlets, may still experience even after receiving a nominal connection. State specific, current data on average hours of supply, voltage quality or outage frequency broken down between Uttarakhand's plains districts and its high Himalayan districts were not available in the sources reviewed for this chapter, meaning the state's genuine early achievement on headline household electrification cannot, on the evidence available here, be confirmed as having delivered equally reliable supply quality across its hill and valley populations, a gap that should be closed through UPCL's own feeder level reliability reporting rather than through continued reliance on a connection count that Saubhagya itself effectively closed out several years ago.

Saubhagya itself built on an earlier scheme, the Deen Dayal Upadhyaya Gram Jyoti Yojana, launched in December 2014, which funded feeder separation between agricultural and non agricultural connections along with sub transmission and distribution infrastructure strengthening nationally, work that the Ministry of Power reports as complete and closed as a scheme (Ministry of Power, Press Information Bureau, n.d.). For a hill state, feeder separation and sub transmission strengthening are arguably more consequential than in the plains, since a single shared feeder serving both an irrigation pump and a remote hamlet's household connections concentrates exactly the kind of voltage instability that undermines nominal electrification gains. Beyond grid extension, the standalone Solar Photovoltaic option built into Saubhagya for genuinely inaccessible habitations points toward a broader off grid and microgrid opportunity for Uttarakhand's most remote settlements, one that would sit naturally alongside the state's own Solar Policy targets discussed in section 9.4, though the state has not, on the evidence reviewed here, published a specific count of how many habitations remain served by standalone solar rather than grid connection, or an assessment of whether those systems continue to function reliably years after installation, a maintenance and longevity question that off grid solar programmes across India have historically struggled to answer well.

It is also worth recalling that the very definition of an electrified village used in Indian rural electrification policy has itself changed over time, moving from a standard requiring only basic infrastructure and a minimum share of households connected toward the household level connection standard Saubhagya applied from 2017 onward. For a state like Uttarakhand, where scattered high altitude hamlets rather than large nucleated villages are the norm in much of the Garhwal and Kumaon hill regions, this shift in definition matters more than a simple national policy footnote, since a hamlet level, rather than village level, accounting standard is the only one capable of revealing whether genuinely isolated clusters of a handful

of households have been reached at all, a distinction the state's own rural development and Panchayati Raj data, discussed in Chapter 12, should be cross referenced against UPCL's electrification records to verify.

9.4 Renewable Energy Potential, Solar, Wind, Hydro and Biomass

Beyond the large hydropower resource discussed in section 9.1, Uttarakhand's most actively developed renewable resource is solar. The state's Solar Energy Policy, launched in 2023, sets a total solar target of 2,000 megawatts, split between 600 megawatts of utility scale generation and 1,400 megawatts of distributed generation, itself broken down as 250 megawatts residential, 750 megawatts commercial and industrial, 350 megawatts institutional and 50 megawatts agricultural (Centre for Science and Environment, 2023). The policy requires all consumers with a sanctioned load above 10 kilowatts to work toward meeting 30 percent of their electricity requirement from renewable sources within five years, and directs the Uttarakhand Renewable Energy Development Agency, or UREDA, to establish a dedicated Solar Policy Cell and a single window clearance portal with a 60 day approval turnaround for developers (Ornate Solar, 2024). Progress against these targets has been distinctly uneven, the Mukhyamantri Saur Swarojgar Yojana, a state programme intended to allocate 10,000 small, 20 to 25 kilowatt solar projects to farmers and small landholders for self employment, had commissioned only 150 such projects totalling around 3.5 megawatts by March 2023, a completion rate below 2 percent of the scheme's own numerical target even as the Uttarakhand Electricity Regulatory Commission extended the scheme's generic tariff of 4.64 rupees per kilowatt hour through March 2026 to keep the programme commercially viable for any further entrants (Mercom India, 2023). Rooftop solar on government buildings has progressed further, with UREDA's first phase covering 18.50 megawatts of capacity across state government buildings, part of a national push under the PM Surya Ghar scheme to saturate technically feasible government rooftop space by the end of 2025 (Uttarakhand Electricity Regulatory Commission, 2025). Residential rooftop adoption is supported by a subsidy structure offering up to 40 percent of system cost for small systems up to 3 kilowatts and 20 percent for systems between 3 and 10 kilowatts, delivered through UREDA in line with national Ministry of New and Renewable Energy guidelines, though the pace of residential uptake against the policy's own 250 megawatt residential solar target was not, on the evidence reviewed here, separately published in a way that would let this framework assess progress against that specific sub target (SolarClue, 2025).

Small hydropower forms a distinct and genuinely active part of the state's renewable portfolio, sitting administratively alongside rather than inside the large hydro capacity discussed in section 9.1. UJVNL's own pipeline includes the Bhilangna small hydro project at 24 megawatts and the Madhmaheshwar small hydro project at 15 megawatts, both scheduled around the middle of this decade, alongside the completed Suringad-II project at 5 megawatts and the Kaliganga-II project at 4.5 megawatts, and the 120 megawatt Vyasi run of the river project on the Yamuna, commissioned in 2022, illustrates that the boundary between small and large hydro in the state's own planning is itself somewhat fluid, since Vyasi's capacity

exceeds several of the state's so called large hydro projects even while being developed and reported alongside the small hydro portfolio (Power Line Magazine, 2023).

Wind and biomass remain considerably less developed than solar, for reasons rooted in the state's own geography. Academic wind resource assessments across different parts of Uttarakhand have found average wind speeds in the range of 5 to 6 metres per second, sufficient for small scale generation in specific favourable locations but well below the wind resource available in states such as Gujarat, Tamil Nadu and Rajasthan that dominate India's utility scale wind capacity (Kumar and Saini, as cited in Springer Nature, 2021). Biomass potential is tied to the state's agricultural residue and forest biomass base, and while state data sources track cropped area, biomass production and family scale biogas plant installations, a consolidated, current estimate of the state's total exploitable biomass power potential in megawatts was not available in the sources reviewed for this chapter, representing a further instance of the granular renewable resource data gap that appears to affect Uttarakhand's smaller, more geographically dispersed energy resources more than its large, centrally tracked hydropower and solar programmes. Looking forward, the state's Renewable Purchase Obligation framework now includes a distinct Energy Storage Obligation, rising from 2.0 percent of total electricity consumption in 2025 to 2026 to 4.0 percent by 2029 to 2030, an explicit regulatory recognition that storage, not just generation capacity, will be the binding constraint on integrating a larger share of intermittent solar generation onto a grid still dominated by dispatchable hydropower (Uttarakhand Electricity Regulatory Commission, 2025).

9.5 Energy Efficiency, Conservation and Demand Side Management

Uttarakhand implements the national energy efficiency architecture administered by the Bureau of Energy Efficiency largely through UREDA's own Energy Conservation Programme, which operates alongside the national Unnat Jyoti by Affordable LEDs for All, or UJALA, scheme and the associated Standards and Labelling framework covering household appliances (UREDA, n.d.). Nationally, these combined demand side and supply side energy efficiency measures delivered energy savings of 50.81 million tonnes of oil equivalent in 2022 to 2023 alone, translating into estimated monetary savings of approximately 188,312 crore rupees economy wide, a scale of national impact that gives some sense of the potential available to a state like Uttarakhand even though a state specific, disaggregated estimate of Uttarakhand's own share of these savings, whether measured in avoided generation capacity, reduced peak demand or consumer bill savings, was not available in the sources consulted for this chapter (Bureau of Energy Efficiency, 2024).

This absence of state specific energy efficiency data is a more consequential gap for Uttarakhand than for many other states, precisely because the state's own hydropower dependence, established in section 9.1, means that avoided demand through efficiency measures displaces power that would otherwise need to be imported or drawn down from storage during dry season low flow periods, rather than simply avoiding fossil fuel combustion as it would in a coal dependent state. A rupee spent on demand side management

in Uttarakhand therefore plausibly delivers a different, and in some respects more valuable, system benefit than the same rupee spent in a thermal heavy state, a distinction that would strengthen the case for UREDA's own conservation programme if the state published disaggregated savings data allowing that case to be made with evidence rather than asserted on the basis of the underlying generation mix alone.

The national UJALA scheme itself, marking its tenth anniversary in January 2025, has distributed subsidised light emitting diode bulbs to households nationally at a fraction of pre scheme market prices, alongside a parallel Street Lighting National Programme that has installed more than 1.34 crore LED street lights through Energy Efficiency Services Limited across urban local bodies nationally (SPM IAS Academy, 2025). Whether Uttarakhand's own urban local bodies, discussed further in Chapter 11, have been fully covered under this street lighting component, and what share of the state's own residential lighting stock has converted to LED under the household facing side of the scheme, are again questions the sources reviewed for this chapter could not answer with Uttarakhand specific figures. A further national instrument with particular relevance to a hill state is the Energy Conservation Building Code, which sets minimum energy performance standards for new commercial construction, since building envelope performance, insulation, glazing and heating load management, matters differently in Uttarakhand's cold hill climate than in the plains states where most of the code's early adoption has concentrated, making local adaptation of the national code, rather than simple adoption of plains oriented default standards, a meaningful design question for the state's own building regulations going forward.

9.6 State Electricity Regulatory Framework and Tariff Policy

The Uttarakhand Electricity Regulatory Commission, or UERC, governs tariff setting and regulatory compliance for the state's power sector through an annual Multi Year Tariff cycle that determines UPCL's allowed revenue, approves generation and distribution loss trajectories, and sets generic tariffs for renewable generators. The Commission's most recent published proceeding, covering the true up for 2024 to 2025, the annual performance review for 2025 to 2026 and tariff determination for 2026 to 2027, records UPCL's own projected revenue gap of 2,036.99 crore rupees for 2024 to 2025 and formalises the distribution loss trajectory, reaching 12.25 percent by 2026 to 2027, discussed in section 9.2 (Uttarakhand Electricity Regulatory Commission, 2025). For power purchased from UJVNL's own hydropower stations, UPCL's tariff petition applies the generation company's latest approved tariff orders directly, while power purchase costs from central sector generating stations are projected using current year actual charges without further escalation, and inter state transmission charges levied by the Power Grid Corporation of India are projected on a per unit basis, a structure that ties Uttarakhand's retail tariff fairly directly to the cost performance of both its own state hydro utility and the wider national transmission and generation system (Uttarakhand Electricity Regulatory Commission, 2025).

On the renewable side, the Commission has set a benchmark capital cost of 9.08 million rupees per megawatt and a generic tariff of 13.70 rupees per kilowatt hour for solar and solar

thermal projects commissioned from April 2022 onward, alongside the separate, lower 4.64 rupee per kilowatt hour tariff for small Mukhyamantri Saur Swarojgar Yojana projects discussed in section 9.4, and the Commission finalised a further round of renewable energy tariffs for 2026 to 2027 in June 2026, around the same time the state marked its first dedicated solar promotion fair, Saur Kauthig, at Rangers Ground in Dehradun (Ornate Solar, 2026; Mercom India, 2023).

A separate but related national policy development bears directly on Uttarakhand's own tariff economics, since the Government of India declared hydropower a renewable source of power in March 2019 and has since worked toward extending the waiver of inter state transmission system charges, already available to solar and wind projects, to hydropower projects as well (Ministry of Power, 2023). If and when fully implemented for Uttarakhand's own inter state power sales, this change would improve the commercial terms on which the state's 46 percent hydropower export share discussed in section 9.1 reaches consumers in neighbouring states, strengthening the revenue base UPCL and UJVNL can draw on domestically. Whether this waiver has in fact been fully extended to Uttarakhand's own inter state hydro sales, and what its quantified revenue impact on the state's utilities has been, was not confirmed in a single authoritative, dated source reviewed for this chapter, and represents exactly the kind of concrete, quantifiable regulatory benefit the state's own energy department should track and report rather than leave to be inferred from national policy announcements alone. Taken as a whole, this regulatory framework shows a Commission actively using tariff design, loss trajectories and renewable procurement obligations as functioning policy levers rather than as purely administrative formalities, a genuine institutional strength for a small hill state, though one whose ultimate effectiveness will only be fully visible once the state closes the same recurring gap this chapter has identified across every preceding section, published, disaggregated performance data at the feeder, district and scheme level that would let the Commission's own tariff decisions be evaluated against actual delivered outcomes rather than against utility reported aggregates alone.

Tariff levels set through this process also feed directly into the industrial competitiveness questions examined in Chapter 4, since the commercial and industrial tariff categories that fund much of the cross subsidy supporting Uttarakhand's residential and agricultural consumers determine, in part, whether the state's Special Economic Zones and industrial corridors can offer power costs competitive with neighbouring plains states that do not carry the same hill specific network cost burden. A Commission balancing a still open revenue gap against the need to keep industrial tariffs competitive for new investment faces a genuine trade off that this chapter's tariff data alone cannot resolve, but that any reader of this framework's investment and industry chapter should keep in view alongside the power sector figures presented here.

Drawing these six sections together, Uttarakhand's energy sector presents a genuinely distinctive profile among Indian states, an exceptionally hydropower rich generation base that remains only partially developed relative to its estimated 25 gigawatt potential, a distribution utility that has made real and measurable progress on technical and commercial losses over

five consecutive years, a household electrification programme that reached effective saturation early but whose ongoing supply quality in remote hill habitations remains unverified by any state published data, an emerging solar programme with an ambitious 2,000 megawatt target running well behind schedule on at least one of its flagship components, an energy efficiency architecture inherited largely from national schemes rather than built around state specific savings evidence, and a regulatory commission that is genuinely active on tariff and loss policy despite working with an incomplete evidence base. The Chamoli disaster of 2021 remains the single most important reminder running through this entire chapter, that the state's greatest energy asset, its Himalayan hydropower potential, is inseparable from the same geological and climate risks addressed in Chapters 13 and 14, and that any acceleration of hydropower development toward the 18 gigawatts of untapped large scale potential identified in section 9.1 must be paired with a proportionate strengthening of the glacial and geological risk assessment capacity discussed in those later chapters, rather than pursued as a purely economic and engineering question in isolation from the mountain environment in which it sits.

Chapter 10: Water, Sanitation and Solid Waste Management

Uttarakhand's water and sanitation record is shaped by a paradox common to Himalayan states: physical abundance alongside chronic service delivery strain. The state sits astride the headwaters of the Ganga and Yamuna systems and is rarely short of raw water, yet its dispersed hill settlements, seasonal pilgrim surges, and administrative capacity constraints mean that turning that abundance into reliable household taps, functioning sewers, and clean pilgrimage routes has proved far harder than the state's geography alone would suggest. The same terrain that gives Uttarakhand its rivers and springs also multiplies the cost of every metre of pipe, every sewer connection, and every waste collection round relative to a flat, contiguous plains district, a structural cost disadvantage that recurs across each of the five subsectors examined below and that the state's own fiscal architecture, discussed in Chapter 2, has only partially offset through the more favourable central funding ratios extended to Himalayan special category states. This chapter examines drinking water supply, irrigation infrastructure, sanitation and open defecation free sustainability, solid waste management, and liquid waste and sewerage treatment in turn, drawing on the same evidentiary caution applied throughout this framework: real, dated figures where available, and an explicit flag where they are not.

10.1 Drinking Water Supply: Coverage, Quality and Infrastructure

Uttarakhand has been one of the stronger-performing states under the Jal Jeevan Mission (JJM), the central government's flagship programme to provide a Functional Household Tap Connection (FHTC) to every rural home. As of late January 2025, official monitoring data showed over 90 percent of households in Uttarakhand (97 percent) had an FHTC, among states not yet certified as fully "Har Ghar Jal" (RES Governance, 2025), while a separate compilation put the figure at 98 percent, attributing northern hill states' strong performance to abundant natural springs and rivers combined with targeted JJM efforts in difficult terrain (India Data Map, 2026). This places Uttarakhand well ahead of the national rural tap coverage figure, which increased from a mere 17 percent in 2019 to over 81 percent by late 2025 (India Data Map, 2026).

This headline coverage figure, however, sits alongside a serious and specific implementation stress that surfaced publicly in 2026. A financial squeeze at the national level, in which the Centre cut Jal Jeevan Mission allocations by more than two-thirds in the FY25 revised estimate, from roughly Rs 70,163 crore to Rs 22,694 crore, and then suspended disbursements in early 2026 citing state non-compliance, left states passing the funding squeeze downstream to contractors; in Uttarakhand, 15,500 schemes reportedly ran on contractors' personal savings (Business Standard, 2026), a state-specific illustration of a broader national pattern in which small and medium contractors across several states, including Andhra Pradesh and Assam, were left holding thousands of crores in unpaid, approved bills. For a hill state where scheme construction and maintenance costs are already elevated by terrain, and where the contractor base executing rural water schemes tends to be smaller and less capitalised than in the plains, this kind of funding interruption risks

converting a genuine coverage success story into a maintenance and reliability failure over time, since contractors funding operations out of pocket have little incentive or capacity to sustain scheme quality once initial connections are reported as complete.

This distinction between reported connection coverage and actual service functionality is not merely theoretical. A 2024 government-commissioned survey found that although nearly 98 percent of rural households nationally had tap connections under JJM, only about three-fourths actually received a regular, safe and adequate water supply (Sanskriti IAS, n.d.), exposing a gap between infrastructure counted as complete and water genuinely delivered. Nothing in the sources available for this chapter suggests Uttarakhand is exempt from this national functionality gap, and given the state's own reported contractor financing crisis, the functional reliability of its high nominal FHTC coverage warrants closer, independent verification than the connection count alone provides.

A more fundamental sustainability question sits beneath even the functionality gap, however: what feeds the taps in the first place. Across the Himalayan region, *naula* and *dhara*, traditional spring structures, have historically been the main sources of water, with glacial contribution to water supply only around 16 percent and the rest coming from springs, and nearly 50 million people in the Indian Himalayan Region depend on these mountain springs as their primary water source, even as the springs are currently drying up (Dialogue Earth, 2025). These springs have been drying up across the region for more than a decade, a trend attributed to a combination of erratic rainfall, deforestation, road-cutting and construction that disrupts sub-surface recharge zones, and rural outmigration that has left fewer people tending the small percolation pits and catchment areas traditional spring maintenance depends on. The Naula Foundation, formed in Uttarakhand's Ranikhet area in 2018, has restored more than 150 *dhara-naula* systems in the Kumaon region (Yes! Magazine, 2023), and a spring-shed revival project led by CEDAR in partnership with CHIRAG, funded by the National Mission on Himalayan Studies, has used satellite imagery and open-source GIS mapping to identify recharge zones before building recharge structures, cutting one Nathuakhan resident's daily water-collection time from two to three hours down to about ten minutes (Dialogue Earth, 2024). Because JJM's rural tap schemes in hill districts frequently draw from precisely these spring sources rather than from piped long-distance transmission, the durability of Uttarakhand's headline FHTC coverage figure depends in part on source sustainability work that sits organisationally outside the Jal Jeevan Mission itself, a linkage the state's water supply planning would benefit from making explicit rather than treating spring revival as a separate rural-livelihoods or climate-adaptation initiative unconnected to tap water coverage targets.

Urban drinking water supply, which falls outside JJM's rural mandate and is instead handled through AMRUT 2.0 for larger towns and state-level urban water schemes for smaller ones, is addressed further in Chapter 11.2 alongside the state's urban local body finances.

10.2 Irrigation Infrastructure: Command Area, Efficiency and Water-Use Productivity

Uttarakhand's irrigation profile is constrained less by water availability than by the state's mountainous topography, which leaves only a small fraction of its total area cultivable in the first place. Of the state's total reported area of 56.72 lakh hectares, only about 7.41 lakh hectares, roughly 14 percent, is available for cultivation, with the net irrigated area to net sown area ratio for the state at 45 percent (Testbook, 2021), meaning that more than half of the state's already small cultivated area continues to depend on rainfall rather than assured irrigation, a vulnerability that matters increasingly given the more erratic monsoon patterns documented in Chapter 14.

The Minor Irrigation Department is the nodal department for conducting the census of minor irrigation works in Uttarakhand, and completed its assessment using a 2013-14 base year, with the sixth national census cycle, using a 2017-18 base year, subsequently initiated by the Government of India; minor irrigation schemes, defined as those with a culturable command area under 2,000 hectares, account for almost the entirety of the state's irrigation infrastructure given the absence of the large multi-district canal systems found in the Indo-Gangetic plains proper. The one major exception is the Upper Ganga Canal system, whose head works lie at Haridwar and whose command area extends into the state's Roorkee sub-region before running principally through western Uttar Pradesh. A field-based study of the Gadarjudda minor canal command area of the Upper Ganga Canal system in Roorkee, Haridwar, found that sugarcane and wheat are the dominant crops, that distribution is inconsistent and inefficiencies are most acute in the tail reaches of the canal, and that most farmers are literate and open to adopting micro-irrigation technology, though the majority are marginal or small-scale with limited financial capacity (ICID-CIID, 2025).

This tail-reach inefficiency pattern is consistent with irrigation engineering literature on canal systems more broadly, where head-reach farmers closer to the main canal tend to capture a disproportionate share of available water, leaving tail-reach farmers to cope with unreliable, reduced supply regardless of their formal entitlement under the command area plan. For Uttarakhand's own portion of this shared command area, addressing this inequity would likely depend less on new infrastructure than on strengthening farmer water user associations and volumetric measurement at minor and sub-minor level, an institutional reform that has proven more durable elsewhere in India than repeated canal-lining or capacity-expansion works alone.

Beyond the Upper Ganga Canal, the great majority of the state's own hill irrigation depends on small, gravity-fed diversion channels known locally as guls, which draw water from hill streams and springs and distribute it across terraced fields without the benefit of any large storage structure, meaning their reliability tracks the same source sustainability concerns documented for drinking-water springs in section 10.1 rather than depending on reservoir-regulated release schedules. Lift irrigation schemes, which pump water from lower-lying streams or rivers up to terraced fields above, supplement gul-based flow

irrigation in areas where gravity alone cannot reach cultivable land, though both approaches share a common vulnerability to the same erratic rainfall and spring depletion trends affecting the state's drinking water sources. Water-use productivity in the Upper Ganga Canal command area has also been examined through crop water requirement modelling, which found that the total crop water requirement in the command area is higher than actual water availability due to poor planning and irrigation practice, with climate models forecasting significant increases in temperature and rainfall variability that will escalate crop water requirements from 2000 to 2050 (Springer Nature, 2021). Since sugarcane, the dominant crop in the Uttarakhand portion of this command area, is a comparatively water-intensive crop relative to its economic return per unit of water applied, diversifying cropping patterns toward less water-intensive alternatives in tail-reach areas where water scarcity is already most acute could do more for aggregate water-use productivity than further attempts to expand the physical water supply reaching those reaches, though such a shift would depend on markets, price supports and processing infrastructure for alternative crops being made available at a scale sugarcane already enjoys through the district's established mill network, a market-structure question that sits outside irrigation engineering alone and connects to the agricultural marketing themes addressed in Chapter 18.3. Water-use productivity data disaggregated to the level of individual crops or hill micro-watersheds beyond this Upper Ganga Canal case study proved difficult to source independently for this chapter, an evidentiary gap that limits how precisely this framework can currently quantify the returns to further irrigation investment in the hill districts specifically, as opposed to the better-documented plains command area.

Institutionally, irrigation planning in Uttarakhand's plains districts operates under command area development principles similar to those used elsewhere in the Ganga basin, but the state's own irrigation department and minor irrigation department function with a more fragmented mandate than a single dedicated Command Area Development Authority would provide, since responsibility splits between departments handling major and medium works, minor irrigation works, and groundwater-based schemes respectively. Consolidating water-use efficiency monitoring across these fragmented mandates, rather than continuing to report canal-command performance separately from hill gul and lift-scheme performance, would give the state a more complete picture of where its irrigation water is actually being used productively and where it is being lost to the same seepage, evaporation and distribution inefficiencies documented in the Gadajudda case study.

10.3 Sanitation and Open Defecation Free Status: Post-ODF Sustainability

Uttarakhand, along with the rest of India's states and union territories, declared itself Open Defecation Free by October 2019 under Phase I of the Swachh Bharat Mission (Grameen), part of a national programme that took rural sanitation coverage from 39 percent in 2014 to 100 percent in 2019 through the construction of over 10.28 crore toilets across 36 States/UTs (Department of Drinking Water and Sanitation, 2024). As one of the designated Himalayan special category states, alongside the north-eastern states, Himachal Pradesh and Jammu and Kashmir, Uttarakhand received central funding for this drive on a 90:10 Centre-state

cost-sharing ratio rather than the standard arrangement applied to most other states (Swachh Bharat Mission, n.d.).

The policy challenge since 2019 has shifted from construction to sustainability, formalised nationally as Phase II of the Swachh Bharat Mission (Grameen), approved in February 2020 with a total outlay of Rs 1,40,881 crore and implemented in mission mode from 2020-21 to 2024-25, aiming to sustain ODF status and improve cleanliness through solid and liquid waste management, converting villages to "ODF Plus" (Swajal Uttarakhand, n.d.). Nationally, this had reached 75 percent of villages by mid-2025, with fourteen states and union territories, including Himachal Pradesh, Gujarat, Kerala and Tamil Nadu, reporting 100 percent ODF Plus village coverage (Grameen, PIB, n.d.); a specific, current, disaggregated percentage figure for Uttarakhand's own ODF Plus achievement could not be independently verified from the sources available for this chapter, a gap this framework flags for direct follow-up against the Department of Drinking Water and Sanitation's public IMIS dashboard, which does report state-wise figures but which this chapter's research was unable to query in disaggregated form.

What can be said with more confidence is that ODF Plus status, and its sustainability, requires exactly the kind of solid and liquid waste management infrastructure examined in sections 10.4 and 10.5 below, meaning that Uttarakhand's rural sanitation achievement cannot be assessed as a standalone toilet-construction success independent of its solid waste and sewerage record. The guidelines governing ODF Plus certification also specifically require villages to endeavour to have at least one Community Sanitary Complex that may cater to the sanitation needs of the floating population (Swajal Uttarakhand, n.d.), a requirement of particular relevance to Uttarakhand given the seasonal, multi-fold surge in effective population that the Char Dham Yatra and other pilgrimage traffic bring to villages along the pilgrimage corridors, a demographic reality already highlighted in this framework's discussion of the state's health system in Chapter 6.2 and its case for differentiated central treatment in Chapter 14.

A further sustainability consideration specific to hill terrain concerns the physical design of the toilets built during the initial ODF push itself. National guidance under Swachh Bharat Mission (Grameen) has generally favoured twin-pit latrine technology, in which two shallow, alternating leach pits allow pathogens in faecal matter to die off naturally over a resting period before the pit is safely emptied and reused, an approach well suited to the sandy, well-drained soils common across much of the Gangetic plains. Uttarakhand's hill districts present a different set of soil, slope-stability and groundwater-proximity conditions, particularly on steep terraced land where excavating two adjacent pits of adequate depth and separation is not always straightforward, and where seasonal monsoon saturation of hill slopes raises separate concerns about leach-pit siting relative to drinking water sources drawn from springs lower on the same slope. Retrofitting toilets originally built to a plains-oriented twin-pit design standard, where such retrofit has proven necessary in hill blocks, adds a further cost and technical-supervision burden on top of the general construction-quality and maintenance challenges already documented for hill health infrastructure in Chapter 6.1,

reinforcing a pattern visible across several sectors in this framework: national programme design calibrated to plains conditions requires deliberate, resourced adaptation, not just extension, when applied to Uttarakhand's hill geography.

Financing for the ODF Plus transition itself draws on a more complex, layered funding architecture than the original toilet-construction push, blending Department of Drinking Water and Sanitation budgetary allocations, the state's own matching share under the 90:10 special-category ratio, tied grants from the Fifteenth Finance Commission routed through rural local bodies, MGNREGS labour convergence for waste-management asset construction, and corporate social responsibility contributions. This layering mirrors the multi-scheme convergence model already documented for the state's industrial and nutrition policy architecture in Chapters 4.2 and 6.6 respectively, and carries the same coordination risk: sustaining ODF Plus status depends on Gram Panchayats successfully drawing down and sequencing funds across several distinct financing verticals simultaneously, an administrative capacity demand that is likely to bind more tightly in the state's more remote hill blocks, where panchayat-level administrative staffing is thinnest, than in its better-resourced plains panchayats.

10.4 Solid Waste Management: Municipal, Biomedical and Hazardous Waste

Solid waste management in Uttarakhand is defined less by routine municipal collection statistics than by the acute, concentrated pressure the Char Dham Yatra places on a small number of high-altitude pilgrimage sites with minimal built infrastructure and severe terrain constraints on mechanised waste handling.

At Kedarnath alone, the 2025 pilgrimage season generated 21.4 metric tonnes of solid waste between May and October, the highest in five years, of which only 8.7 tonnes, 40 percent, was processed, with the remaining 12.7 tonnes piling up in landfills or open dumps near base camps, according to data the Kedarnath Nagar Panchayat released in response to a Right to Information query (Curly Tales, 2026). A separate account of the same season recorded 2,300 tonnes of garbage accumulated in and around Kedarnath Dham, comprising roughly 100 tonnes of plastic and 2,200 tonnes of other solid waste, generated by a record 17.68 lakh pilgrims, with each pilgrim generating on average one and a half kilograms of garbage, about 150 grams more than the previous year (Garhwal Post, 2025). Because burning waste and constructing large disposal plants are both prohibited in this ecologically sensitive, glacier-adjacent high-altitude zone, collected garbage can only be transported down by mules and porters to Gaurikund and then by vehicle to Rudraprayag for further processing, a logistics chain that itself consumes much of the capacity that would otherwise go toward waste processing rather than mere removal.

The state and district administrations have layered several targeted interventions atop this base picture rather than resolving the structural capacity gap outright. A digital deposit-refund scheme using QR-coded packaging was piloted at Kedarnath between May and July 2022, with Recykal partnering with local hotels, shops and temples to distribute trackable QR codes, before the system was expanded to Gangotri, Yamunotri and Badrinath

between September and November 2022 (Recykal, n.d.). A separate, more recent "Carry Me Back" public-participation campaign, launched by the Rudraprayag district administration with the Kedarnath Nagar Panchayat, Healing Himalayas Foundation and Sulabh International, had brought around two tonnes of non-biodegradable waste back down from the Kedarnath route through pilgrims and tourists by mid-2026 (ETV Bharat, 2026). These are genuine, low-cost interventions, but set against a season that generates upward of twenty tonnes of waste with less than half of it processed, they function more as partial mitigation than as a structural solution, and the persistent year-on-year rise in both total tonnage and per-pilgrim waste generation, tracked through the district's own RTI-disclosed figures across successive seasons, suggests that voluntary and awareness-based measures alone have not yet bent the underlying trend line.

The economic logic of the problem is straightforward even where the engineering solution is not: over 47 lakh pilgrims visited the Char Dham shrines collectively during the 2025 season, with officials noting a heavy increase in non-biodegradable waste like plastic and thermocol at Kedarnath and Badrinath (Newstak, 2025), and the same religious tourism economy that Chapter 19 identifies as one of the state's most significant economic assets is also the direct driver of a waste stream that terrain, altitude and ecological-sensitivity restrictions on incineration and landfill construction make disproportionately expensive to manage per tonne relative to a comparable urban waste stream in the plains. Treating pilgrimage-season solid waste management as a cost of the tourism revenue it accompanies, funded and staffed at a scale proportionate to yatra footfall projections issued each year by the state tourism department, rather than as a recurring emergency response, would align the state's waste management planning with the same revenue base that the pilgrimage economy already generates.

Beyond the pilgrimage corridor, the state's urban centres face a more conventional but still substantial municipal solid waste burden. Dehradun alone was estimated to generate 327.9 tonnes of plastic waste per day, set to increase to 584.051 tonnes per day, with a local NGO having recycled 6,772 tonnes of plastic waste in the city over three years since 2018 (Pressreader/Hindustan Times, 2021), though more current, verified municipal solid waste generation figures specific to Dehradun or the state's other urban centres could not be confirmed for this chapter. On the regulatory side, the Uttarakhand Pollution Control Board administers registration and renewal processes under the Plastic Waste Management Rules 2022, the Battery Waste Management Rules and the E-Waste Management Rules, alongside a standard operating procedure for recycling waste tyre scrap for recovery of tyre pyrolysis oil (Uttarakhand Pollution Control Board, 2025), placing source-segregation and extended producer responsibility obligations on manufacturers, brand owners and bulk waste generators operating in the state.

Biomedical and hazardous waste management falls under this same regulatory oversight, with random inspection of outsourced biomedical waste treatment facilities such as the Medical Pollution Control Committee facility at Bhagwanpur, Haridwar, required at least once every six months (SRHU, 2025). National biomedical waste management guidance requires

colour-coded segregation of infectious, sharps, chemical and general waste at the point of generation within each health facility, a requirement whose practical enforcement across Uttarakhand's dispersed and, as documented in Chapter 6.1, frequently under-resourced Primary and Community Health Centres depends heavily on staff training and supervision capacity rather than on the existence of the segregation rule itself. State-aggregate biomedical and hazardous waste tonnage figures current enough for confident citation here were not located during this chapter's research and are flagged for follow-up using the Board's own annual hazardous waste inventory reports.

10.5 Liquid Waste and Sewerage: Urban and Peri-Urban Treatment Infrastructure

Sewerage and liquid waste treatment is the area of this chapter's subject matter where Uttarakhand's investment has been most substantial in absolute terms, channelled overwhelmingly through the Namami Gange programme given the state's position at the headwaters of the Ganga, and where the gap between investment and verified outcome is also most starkly documented.

By the early 2020s, 36 sewage infrastructure projects costing Rs 1,373 crore were sanctioned to create 195 MLD of STP capacity and to lay or rehabilitate a 184-km sewer network in Uttarakhand (The Print, 2022), building on an earlier tranche of 31 sewage management projects worth Rs 1,024.5 crore sanctioned to create 155.45 MLD of STP capacity and 151.02 km of sewer network, specifically to bring Haridwar and Rishikesh toward 100 percent sewage treatment (PIB, 2018). Haridwar's own treatment capacity has since been expanded substantially: two new STPs commissioned under the Namami Gange Mission added a combined 82 MLD of capacity, more than doubling the city's total to 145 MLD, with the larger of the two, a 68 MLD facility at Jagjeetpur, ranking as Uttarakhand's largest sewage treatment plant and producing treated water reused for irrigation, which farmers report improves crop quality compared with groundwater (Organiser, 2025).

Despite this investment, a Comptroller and Auditor General report found that nearly a third of the state's STPs were discharging inadequately treated or untreated sewage into the Ganga despite the roughly Rs 1,000 crore already spent under Namami Gange; in Haridwar, a 68 MLD STP was treating an average of 71 MLD in March 2023, with peak inflows reaching 84 MLD, exceeding its designed capacity years ahead of its 2028 schedule (Down To Earth, 2026). The report found that total coliform levels increased 32-fold over just 93 kilometres between Devprayag and Haridwar, and identified discrepancies between data recorded by the Central Pollution Control Board and the Uttarakhand Pollution Control Board, with the state board recording faecal coliform at 58 against the central board's reading of 14×10^3 for the same parameter in March 2023 (Down To Earth, 2026), a divergence serious enough to call the reliability of the state's own water quality monitoring system into question. The Uttarakhand Pollution Control Board was allocated Rs 16.21 crore for National Accreditation Board for Testing and Calibration Laboratories accreditation, but only Rs 5.55 crore, about 34 percent, was spent over five years, and not a single laboratory applied for accreditation during

this period (Down To Earth, 2026), meaning the very body responsible for verifying Ganga water quality has not itself met the testing-credibility standard the programme requires.

Sewer network connectivity, as distinct from treatment plant capacity, shows a similar gap between built infrastructure and actual household uptake. In Rishikesh, the audit found 9,966 of 34,756 households, about 28.6 percent, connected to the sewerage network, indicating that a large proportion of households continue to discharge wastewater outside the formal network; the audit also found that no district-level river basin management plan had been prepared, and that the State Ganga Committee and implementing agencies did not involve local people in planning the Namami Gange infrastructure (Down To Earth, 2026), pointing to a planning process that has been centrally and technically driven rather than locally anchored.

The Namami Gange investment documented above has been concentrated almost entirely on the main-stem Ganga corridor running through Devprayag, Rishikesh and Haridwar, reflecting the programme's national mandate and funding structure. Elsewhere, smaller electro-coagulation-based STPs have been installed at Gopeshwar (1.12 MLD) and across six units in Rudraprayag, and pollution abatement works undertaken for the river Alaknanda at Kirtinagar (Construction World, 2022), a comparatively modest scale of investment relative to Haridwar and Rishikesh. Uttarakhand's numerous smaller hill towns along tributary rivers, the Alaknanda, Bhagirathi, Mandakini and their own tributaries, along with pilgrimage and tourist towns away from the main Ganga stem entirely such as Nainital, Almora and Mussoorie, have received comparatively modest sewerage investment by comparison. Given that many of these smaller hill towns face the same seasonal pilgrim and tourist population surges that strain Char Dham corridor infrastructure, and given that untreated sewage from any point along these tributary systems ultimately reaches the same main-stem Ganga that the larger STP investments are meant to protect, a peri-urban and hill-town sewerage gap of this kind risks undermining the return on the state's main-stem investment even where that investment is, in isolated cases like the Jagjeetpur reuse scheme, genuinely working as intended.

Taken together with the STP capacity and monitoring reliability findings, this suggests that the state's sewerage investment, while substantial and genuinely productive in specific locations such as the Jagjeetpur reuse scheme, has not yet been matched by the household connection rates, capacity headroom, geographic spread beyond the main Ganga stem, or credible independent monitoring needed to translate that investment into a measurably cleaner river system statewide, a gap with direct relevance to the state's broader river and wetland health agenda addressed in Chapter 13.3.

A common thread runs across all five of the subsectors examined in this chapter, and it is worth naming explicitly before moving to the next. In drinking water, irrigation, sanitation, solid waste and sewerage alike, Uttarakhand's headline coverage and investment figures, 97 percent FHTC coverage, 45 percent net irrigated area, ODF status achieved statewide since 2019, Rs 1,373 crore in sanctioned sewerage projects, are each accompanied by a documented, specific gap between what has been built or declared and what is functioning

reliably on the ground: contractor-financed schemes of uncertain durability, tail-reach canal farmers receiving a fraction of their nominal entitlement, twin-pit toilets poorly suited to hill terrain, less than half of Kedarnath's pilgrimage-season waste actually processed, and sewage treatment plants discharging above design capacity into a river whose own monitoring data cannot be fully trusted. Any one of these gaps, read in isolation, might be dismissed as a sector-specific implementation hiccup; read together, across five otherwise unconnected subsectors managed by different departments and funded through different central schemes, they instead look like a single, recurring institutional pattern, in which programme design and financing are calibrated centrally, often on plains-oriented assumptions, while the harder work of adapting that design to hill terrain, verifying that reported infrastructure is actually functioning, and monitoring outcomes independently of the agencies responsible for delivery, is left under-resourced at the state and district level. None of this means the underlying programmes have failed; JJM's rural coverage, the Jagjeetpur reuse scheme, and the community-led spring revival movement are all real, measurable achievements. But it does mean that future editions of this framework, and the state's own departmental reporting, would serve Uttarakhand better by routinely pairing every coverage or investment headline with its corresponding functionality, connection-rate, or independently verified quality figure, the same discipline recommended for the health sector in Chapter 6.8, so that genuine progress is neither obscured by nor mistaken for the harder, unfinished work of actually delivering the service that infrastructure alone cannot guarantee.

Chapter 11: Urban Development, Housing and Smart Cities

Uttarakhand remains, by Census measure, one of India's less urbanised states, yet its urban story is shaped less by scale than by concentration and pressure: a handful of towns absorbing most of the state's growth, a pilgrimage economy that periodically multiplies a small town's effective population many times over, and municipal institutions that, this chapter's own evidence shows, remain financially thin relative to the services they are asked to deliver. This chapter examines urbanisation trends and governance architecture, the financial health and capacity of urban local bodies, housing demand and flagship schemes, the state-level record under the Smart Cities Mission and AMRUT, heritage cities and urban tourism, and urban poverty and slum rehabilitation in turn.

11.1 Urbanisation Trends and Urban Governance Architecture

Uttarakhand's urban population stands at 30.5 lakh, with an urbanization rate of 30.2%, close to the national average of 31.2%. The urban growth rate, averaging 4.0% annually, is significantly higher than the rural growth rate of 1.2% (Urban Development Department, Uttarakhand, n.d.). What distinguishes the state is not the level of urbanisation but its pace and concentration: this growth has clustered overwhelmingly in a small number of towns. Urban population of the state is mainly concentrated in bigger towns of Dehradun (5.75 lakh), Haridwar (2.31 lakh) and the towns located in the agriculturally rich and industrially developed southern part of the state, e.g. Rudrapur, Roorkee, Kashipur and Haldwani; Dehradun, the state capital and centre of policy making, has experienced drastic enhancement in its urban population, growing at an average annual rate of over 4 percent between Census 2001 and Census 2011 (Town and Country Planning Department, Uttarakhand, n.d.).

No decennial Census has been conducted since 2011, the 2021 round having been postponed and not yet completed at the time of this framework's preparation, which means every urbanisation figure cited above and throughout this chapter rests on a data source now a decade and a half old, updated only through modelled projections rather than direct enumeration. This is a material limitation for urban planning purposes: master plans, service-level benchmarks and infrastructure sizing decisions taken by the state's Town and Country Planning Department and its urban local bodies continue to reference 2011 population distributions even as on-the-ground growth, particularly hill-to-plains migration into Dehradun and the Terai towns, has likely shifted the state's urban geography further than the last count can show. Uttarakhand population is projected to grow at an average yearly rate of around 0.96% up to 2036 (Census of India.net, n.d.), among the lower rates nationally, but this masks the sharper differential between rural out-migration from hill districts and continued urban in-migration into the handful of plains towns that this chapter's later sections return to repeatedly.

The practical consequence of planning against a fourteen-year-old population baseline shows up most directly in master plan currency. Uttarakhand's larger towns are each meant to operate under a statutory master plan prepared or revised by the Town and Country Planning

Department in consultation with the relevant development authority, setting land-use zoning, permissible densities and infrastructure reservation for a twenty to twenty-five year horizon; where these plans were drawn up using 2011 or earlier population and growth-rate assumptions, as most necessarily were given the data available at the time of preparation, their underlying projections for water demand, road capacity and civic land requirements have likely already been overtaken in the state's fastest-growing towns, Dehradun foremost among them, well before the plans' nominal horizon years arrive. Absent an intermediate population survey or a locally commissioned demographic update, addressing this gap in the near term will depend on the state's willingness to revise master plan assumptions using administrative data sources, voter rolls, ration card registrations, school enrolment, utility connections, as a proxy for population change, rather than waiting for the next full Census round to validate what current growth patterns already suggest.

Uttarakhand's tourist and pilgrim inflows add a further, distinctive layer to its urban population story that Census enumeration does not capture at all. Apart from the resident urban population, Uttarakhand has a number of tourist destinations and places of pilgrimage, and nearly 311.08 lakh and 268.09 lakh tourists visited the state in 2010 and 2011 respectively, figures nearly three times the whole population of the state itself, reflecting the "tourist load" on urban infrastructure and urban services (Town and Country Planning Department, Uttarakhand, n.d.), concentrated overwhelmingly in a short summer and autumn season and in a small number of pilgrimage and hill-station towns. This places demands on urban water, sanitation, transport and waste infrastructure that bear no relationship to the resident population figures on which that infrastructure's design capacity is typically based, a tension already documented in this framework's discussion of Char Dham corridor strain in Chapters 6 and 10.

Governance of this urban system runs through a three-tier structure of Nagar Nigams (municipal corporations), Nagar Palika Parishads (municipal councils) and Nagar Panchayats, elected under the 74th Constitutional Amendment Act framework, alongside development authorities such as the Mussoorie Dehradun Development Authority (MDDA) that hold planning and land-use powers over wider metropolitan areas than the municipal bodies themselves. This dual structure, elected municipal bodies responsible for day-to-day civic service delivery and appointed development authorities responsible for land-use planning and larger capital works, is common across urban India, but it carries a particular tension in Uttarakhand given how much of the state's urban capital investment, reviewed in sections 11.3 and 11.4 below, flows through development authorities and special purpose vehicles rather than through the elected municipal bodies themselves, leaving the directly accountable tier of urban government with comparatively limited control over the infrastructure decisions that most shape residents' daily experience of city services.

The 2025 Uttarakhand Municipal general elections were held on 23 January 2025 to elect members of 100 municipalities in the state, covering all 11 municipal corporations, 43 municipal councils, and 47 nagar panchayats, with results declared on 25 January 2025, and voter turnout of 65.41 percent. Elections were postponed for the municipal council of

Narendranagar and notified area council of Pati and Garhinegi, held later on 9 June 2026, while elections in Kichha were postponed for an indefinite period (Wikipedia, 2026), illustrating that even the basic electoral cycle underpinning local self-governance in the state has not run entirely smoothly.

11.2 Urban Local Bodies: Financial Health, Capacity and Service Delivery

If Chapter 2 documented the state government's own fiscal dependence on central transfers, a Comptroller and Auditor General performance audit on implementation of the 74th Constitutional Amendment Act, covering the period 2015-16 to 2020-21, shows that dependence repeating itself one tier down, with Uttarakhand's urban local bodies considerably more grant-dependent than the state government itself. Across 91 ULBs, own revenue fell from 16.14 percent of total revenue in 2015-16 to 10.16 percent by 2020-21, averaging 14.09 percent across the six-year period; fiscal transfers from government formed 86 percent of ULB revenue during 2015-16 to 2020-21, and a spike in own-revenue collection in 2017-18 was due to collection of arrears of previous years, while 2018-19 collection was impacted by staff deployment for General Election duties and 2020-21 revenue was affected by the Covid-19 pandemic (Comptroller and Auditor General of India, 2022).

Funds allocated by the State Government under the State Finance Commission were fully released with no shortfall, and Central Finance Commission basic grants were also fully released each year; however, the Performance Grant for 2018-19 and 2019-20 was not released by the Government of India, despite the Urban Development Directorate stating that demand had been uploaded for ULBs meeting the required conditions (Comptroller and Auditor General of India, 2022), an unresolved accountability gap between the two levels of government. Expenditure to total revenue of the ULBs ranged from 63 to 76 percent, meaning unspent balances ranged from 24 to 37 percent over the period, attributed to late receipt of SFC grants, ongoing construction works, and unspent balances under IHHL and PMAY where beneficiary payments were made in instalments; establishment expenditure constituted about 48 percent of total expenditure, followed by other capital and revenue expenses at 46 percent (Comptroller and Auditor General of India, 2022).

The ULBs were able to generate own resources only to the extent of 19.77 percent of revenue expenditure during the period, showing a large resource-expenditure gap (Comptroller and Auditor General of India, 2022), meaning that for every rupee Uttarakhand's municipal bodies spent from their own operating budgets, roughly four-fifths had to come from external grants rather than locally raised taxes, fees or charges. While authority to collect taxes like property tax is vested with the ULBs, the State Government may by general or special order require a municipality to impose, increase, modify or vary any tax, meaning the ULBs lacked autonomy in levying and collecting their own revenue sources; Municipal Corporations also had limited powers to spend even their own funds until March 2019, when they were given full powers to spend their own funds (Comptroller and Auditor General of India, 2022).

The Uttarakhand Municipal Accounting Manual required an Accrual Based Double Entry System of accounting to replace single-entry cash-based accounting in all ULBs, but audit found the ULBs were still maintaining accounts on a single-entry basis (Comptroller and Auditor General of India, 2022). The audit's recommendations, granting ULBs genuine taxation autonomy, improving property tax collection practice, growing non-tax revenue streams, and completing the shift to double-entry accounting, remain, on the evidence available, substantially unimplemented, a reform agenda this framework's own review of the state's next State Finance Commission report should specifically track.

Staffing capacity compounds these financial constraints in ways the audit also documents in passing: ULBs did not have the powers to assess staff requirements or recruit required permanent staff except on a contractual basis, as these powers were vested with the State Government, and the ULBs were working with an acute shortage of staff, dependent on outsourced staff (Comptroller and Auditor General of India, 2022). This combination, revenue authority retained substantially by the state, spending authority only recently and partially devolved, and staffing authority still centrally held, means that Uttarakhand's ULBs operate with a narrower band of genuine institutional autonomy than the 74th Constitutional Amendment Act's own design intended, a gap between constitutional decentralisation on paper and administrative decentralisation in practice that recurs, in different sectoral forms, across several chapters of this framework.

11.3 Housing: Demand Assessment, Affordability and Flagship Schemes

Housing policy in Uttarakhand runs through the same Pradhan Mantri Awas Yojana-Urban (PMAY-U) architecture used nationally, with the state benefiting, as in several other sectors covered in this framework, from the more favourable 90:10 Centre-state cost-sharing ratio extended to Himalayan special category states rather than the standard 60:40 split applied elsewhere. As on July 29, 2024, 1.18 crore houses had been sanctioned nationally and 85.4 lakh had been constructed under PMAY-U (PRS Legislative Research, 2024), ahead of the scheme's relaunch as PMAY-U 2.0 in September 2024 targeting a further one crore urban families by 2029; by August 2025, more than 120 lakh houses had been sanctioned under the combined schemes, of which 93.81 lakh pucca houses had already been constructed and delivered to beneficiaries (PIB, 2025).

Against this national completion pattern, Uttarakhand's own record shows a specific and significant shortfall. Some states, including Bihar, Haryana, Punjab, Karnataka, Jharkhand, Uttarakhand, and the National Capital Territory of Delhi, have covered less than 30 percent of the estimated households under the housing shortage estimated under Census 2011, whereas states like Andhra Pradesh, Gujarat and Mizoram sanctioned houses more than the estimated shortage (PRS Legislative Research, 2024). This gap between assessed need and actual sanction is a different, and in some ways more fundamental, problem than the completion-rate gap this framework has documented in other sectors, since it points to insufficient project origination rather than merely slow execution of already-approved projects.

The state government has moved on two fronts to address this gap more recently. In December 2024, Uttarakhand signed its formal implementation agreement with the Centre for PMAY-U 2.0, and separately announced a new state affordable housing policy the same month, alongside a distinct state-driven initiative to construct 16,000 affordable homes for low-income families, spearheaded jointly by the Uttarakhand Housing Development Council and the Mussoorie Dehradun Development Authority in partnership with private developers. Of this target, 15 projects led by private investors accounted for 12,856 homes, while various development authorities were constructing an additional 3,104 units, with a target to complete all projects by March 2025 (Drishti IAS, n.d.); whether this target was met in full could not be independently verified from sources available for this chapter and is flagged for follow-up against the state Housing Department's own project completion reporting.

Beyond the flagship national scheme, PMAY-U's four implementation verticals, Beneficiary Led Construction, Affordable Housing in Partnership, In-Situ Slum Redevelopment and the Credit Linked Subsidy Scheme, each carry different implications for Uttarakhand's hill-versus-plains housing divide: Beneficiary Led Construction, which supports individual households building or extending their own homes, is likely better suited to dispersed hill settlements than the Affordable Housing in Partnership vertical's group-housing model, which depends on the same land-assembly and developer-partnership conditions that Chapter 4.1 already identified as more difficult to secure in hill districts than in the plains. A disaggregation of Uttarakhand's PMAY-U sanctions by vertical and by hill-versus-plains district, which would let this framework assess whether the state's housing shortfall is concentrated in one terrain type or spread evenly, was not available from the sources consulted here and is recommended as a priority addition to the state's own housing data reporting.

Affordability itself remains a live constraint even where projects are sanctioned. The Credit Linked Subsidy Scheme vertical, which provides interest subsidy on home loans rather than direct construction assistance, depends on beneficiary households having sufficient, documentable income to qualify for and service a formal home loan in the first place, a precondition that is harder to meet in a state where a meaningful share of the workforce operates in tourism-linked seasonal employment or informal hill agriculture than in states with a larger salaried, formal-sector employment base. Under PMAY, affordable housing is generally defined as homes with a price limit of Rs 45 lakh for urban areas, based on the buyer's income group and property size (ClearTax, 2026), and given the land cost premium the Directorate of Industries' own hill incentive design already implicitly recognises for construction in Uttarakhand's hill and even peri-urban plains locations, the practical affordability threshold facing genuinely low-income households in towns like Dehradun and Haridwar may sit meaningfully below what the national PMAY price ceiling assumes.

A further consideration specific to Uttarakhand's terrain is seismic safety. The state sits substantially within Seismic Zone IV and, in its higher Himalayan reaches, Zone V, the two highest hazard classifications in India's national seismic zoning map, a risk profile examined further in this framework's disaster risk chapter, and one that has direct implications for

PMAY-U construction standards. Beneficiary Led Construction homes built by individual households with limited technical supervision carry a materially higher risk of non-compliance with earthquake-resistant design norms than group housing built under the Affordable Housing in Partnership vertical, where a single empanelled developer and a formal building-plan approval process provide at least a nominal quality-assurance layer; whether the state's PMAY-U implementing agencies have systematically verified earthquake-resistant construction practice across the thousands of individual Beneficiary Led Construction units sanctioned to date is a question this chapter's sources could not answer, but one that matters more in Uttarakhand than in most other PMAY-U implementing states given the scale of seismic exposure documented elsewhere in this framework.

11.4 Smart Cities Mission and AMRUT: State-Level Implementation Review

Dehradun is Uttarakhand's sole representative under the national Smart Cities Mission. Phase 4 of the Smart City Dehradun Mission project officially recognised Dehradun as one of the smart cities selected by the Indian government; the Mussoorie Dehradun Development Authority prepared a SMART City Dehradun Plan and has implemented projects including redevelopment, beautification, road enlargement, disaster management, LED lighting and solid waste management (Square Yards, 2026), the last connecting directly to the municipal solid waste concerns documented in Chapter 10.4 via a ward-wise waste collection tracking system. The Smart Cities Mission was officially shut down on 31 March 2025, and as of January 2025, 7,479 of a total 8,058 tendered projects had been completed nationally, utilising over Rs 1,500 billion of the total allocated amount (Wikipedia, n.d.), and by August 2025, government reported 95 percent of the total roughly eight thousand projects completed, with 7,336 projects worth over Rs 1,53,000 crore finished and all hundred smart cities having established Integrated Command and Control Centres (News on Air, 2025). A Dehradun-specific completion percentage and project count, however, could not be confirmed from the sources available for this chapter, a gap worth closing against Dehradun Smart City Limited's own public reporting before drawing firm conclusions about the mission's success in the state's single participating city.

AMRUT, the companion scheme focused on basic urban infrastructure rather than the Smart Cities Mission's more area-specific interventions, has a wider footprint. In Uttarakhand, AMRUT has been implemented in seven cities: Dehradun, Haridwar, Haldwani, Rudrapur, Kashipur, Roorkee, and Nainital (Urban Development Department, Uttarakhand, n.d.). Under AMRUT 1.0, total projects approved reached 151, worth Rs 592.02 crore, with 148 completed worth Rs 564.53 crore, and seven GIS-based master plans prepared (Urban Development Department, Uttarakhand, n.d.), while 72,607 new water connections were achieved against a target of 70,885, and 43 of 44 planned parks were constructed (Grokikipedia, 2025). AMRUT 2.0, launched in October 2021, has total approved funding of Rs 650 crore for the state, comprising Rs 585 crore central assistance and Rs 65 crore state assistance (Urban Development Department, Uttarakhand, n.d.), and co-treatment, faecal sludge treatment plant, or wastewater treatment plant projects have been initiated in six of the state's seven AMRUT cities, with co-treatment specifically proposed in existing STPs in

Dehradun, Haridwar, Rishikesh, Srinagar and Ramnagar, and faecal sludge treatment plants proposed in Rudrapur and Rudraprayag (NFSSM Alliance, n.d.).

This national-scheme funding has been supplemented by direct multilateral financing, principally from the Asian Development Bank, through the Uttarakhand Urban Sector Development Investment Program and its successor, the Uttarakhand Integrated and Resilient Urban Development Project. The additional financing will construct one sewage treatment plant with 10 MLD capacity, 268 km of sewer networks, and about 99 km of stormwater drainage networks, along with 12,000 household sewer connections in Dehradun and Haldwani, including at least 90 percent of identified poor and vulnerable households (Asian Development Bank, n.d.).

Capacity building has run alongside this infrastructure spending, at least in its early design: six cities in Uttarakhand, Dehradun, Haridwar, Haldwani-Kathgodam, Rudrapur, Kashipur and Roorkee, were chosen for Service Level Improvement Plans (SLIP), with each mission city given advance assistance of Rs 25 lakh for SLIP preparation (Tribune News Service, n.d.). Whether these plans have translated into measurably improved service-level benchmarks in the years since, as distinct from the physical infrastructure projects the AMRUT funding itself financed, could not be verified from the sources available for this chapter.

This multi-decade ADB engagement in the state's urban sector has not been free of controversy: Tranche 4 projects worth Rs 237.73 crore were underway in Haridwar, Nainital and Dehradun, and Tranche 2 projects worth Rs 288.47 crore were being carried out in Dehradun, Ramnagar, Haldwani, Nainital and Rishikesh; an inquiry report of the State Planning Commission had found widespread alleged irregularities and serious lapses in a Rs 183-crore ADB-sponsored sewer lines project in Mussoorie and Dehradun, on which the government had yet to act (Tribune News Service, n.d.). Taken together, the Smart Cities and AMRUT record in Uttarakhand shows the same pattern already established in Chapter 10's review of Namami Gange investment: substantial, genuinely productive infrastructure spending, alongside specific, documented gaps in transparency, oversight and, in Dehradun's case, publicly verifiable completion data.

11.5 Heritage Cities, Cultural Landscapes and Urban Tourism

Uttarakhand occupies a curious position in India's principal heritage-city urban scheme: the National Heritage City Development and Augmentation Yojana (HRIDAY), launched on 21 January 2015 and implemented in 12 cities, Ajmer, Amaravati, Amritsar, Badami, Dwarka, Gaya, Kancheepuram, Velankanni, Mathura, Varanasi, Puri and Warangal, ended on 31 March 2019 with no new projects or cities taken up after that date (PIB, n.d.), and none of these twelve cities are located in Uttarakhand, meaning that neither Haridwar nor Rishikesh, the state's two most historically and religiously significant urban centres, received the dedicated heritage-city infrastructure and civic-amenity funding this scheme provided to its selected cities. Instead, Uttarakhand's pilgrimage infrastructure has been funded principally through the Ministry of Tourism's separate PRASAD scheme, renamed PRASHAD in 2020

when "development of heritage sites" was added to the name, a scheme aimed at integrated development of popular religious, spiritual and heritage sites providing infrastructure such as parking, pathways, toilets and illumination (The Print, 2025).

Three PRASHAD projects have been sanctioned for Uttarakhand: Integrated Development of Kedarnath, sanctioned in 2015-16 at Rs 34.77 crore with Rs 34.77 crore released, showing 100 percent physical and 100 percent financial progress; Development of Infrastructure for Pilgrimage Facilitation in Badrinath Ji Dham, sanctioned in 2018-19 at Rs 56.15 crore with Rs 27.43 crore released, showing 62 percent physical and 49 percent financial progress; and Augmentation of Pilgrimage Infrastructure Facilities at Gangotri and Yamunotri Dham, sanctioned in 2021-22 at Rs 54.36 crore with only Rs 10.22 crore released, showing 100 percent physical but only 18 percent financial progress (PIB, Ministry of Tourism, 2024). This lag is consistent with a national pattern in which less than 50 percent of the 46 projects sanctioned under the PRASHAD scheme nationally had been completed over the scheme's first ten years (The Print, 2025).

Beyond the Char Dham circuit itself, urban tourism infrastructure in the state's hill stations and heritage towns, Nainital, Mussoorie, Almora and the Haridwar-Rishikesh corridor, has been funded through a patchwork of AMRUT allocations, state tourism department schemes, and project-specific central assistance rather than through any single, dedicated heritage-urban development programme comparable to HRIDAY. Haridwar and Rishikesh in particular sit at an unusual intersection of funding streams without a clear single lead scheme: both cities feature prominently in the Namami Gange sewerage investment reviewed in Chapter 10.5, both are AMRUT mission cities under section 11.4 above, both attract the same pilgrim and tourist "load" documented for the Char Dham towns in this section, yet neither has ever been formally recognised as a heritage city under HRIDAY nor received a dedicated urban tourism master plan integrating these separate funding streams into a single coherent capital investment programme, leaving Ganga-facing ghat development, ashram-area traffic management, and religious-tourism carrying capacity to be addressed piecemeal across whichever scheme happens to have an open funding window in a given year.

This fragmentation matters because these towns face a genuinely distinct urban management challenge from India's HRIDAY cities: most combine a small resident population with an enormous, sharply seasonal, non-resident pilgrim and tourist population, the same "tourist load" phenomenon already documented in section 11.1, meaning that civic infrastructure sized to resident Census population, the norm HRIDAY and most Indian urban schemes assume, will systematically undersize water, sanitation, parking and solid waste capacity relative to what these towns actually need at their annual peak. A dedicated state-level urban tourism infrastructure framework that explicitly sizes civic capacity to peak seasonal load rather than resident population, an approach partially visible in the 2026 e-Swasthya Dham health monitoring initiative discussed in Chapter 6.2 and 10.4, would represent a more coherent response to this structural mismatch than continuing to fund heritage and pilgrimage towns through generic urban schemes not designed with seasonal population multiplication in mind.

11.6 Urban Poverty, Slum Rehabilitation and In-Situ Upgradation

Slum settlement in Uttarakhand is concentrated in the same handful of plains and Terai towns that dominate the state's broader urbanisation pattern, with Census 2011 slum enumeration covering identified slum clusters in towns including Haldwani-cum-Kathgodam, Nainital, Rudrapur, Kashipur, Haridwar, Roorkee, Rishikesh and Dehradun itself. Under the state's slum policy and upgrading strategy, basic infrastructure was targeted for improvement in 69 slums in Dehradun, 20 in Haridwar, 10 in Nainital and 16 in Rudrapur (Uttarakhand Urban Sector Development Agency, n.d.), delivered through a demand-led, community-participation model working with community-based organisations and non-government organisations rather than through purely top-down municipal execution.

Academic research has noted that rapid urbanisation is increasing in the mountainous regions of the Himalayan states of Uttarakhand, with urban sprawl, suburban and slum areas increasing due to unemployment, poverty and migration (Academia.edu, 2023). Haldwani offers a particularly concrete illustration of how this migration pressure has forced municipal boundary adjustment: Haldwani, situated in the immediate foothills of the Kumaon region, is the third-most populous city in the state; in 2018, the Haldwani municipal boundary was expanded to include peri-urban areas, increasing the number of wards from 33 to 60 to accommodate the influx of migrants who had occupied the peri-urban areas over time, with Dehradun itself experiencing unprecedentedly rapid growth mainly from urban migration by hill villagers who suffered unstable horticultural conditions because of climate change and sought better employment and education opportunities (Asian Development Bank, n.d.), a formal acknowledgement that the city's earlier boundaries no longer reflected where its actual population, including its poorest residents, was living.

Under PMAY-U's In-Situ Slum Redevelopment vertical, which provides a redevelopment grant to rehabilitate slum dwellers on the same land they currently occupy rather than displacing them to peripheral resettlement colonies, Uttarakhand's urban local bodies, including Nagar Nigam Dehradun, have been required to conduct household-level slum surveys and prepare slum-wise intervention strategies for untenable slums under PMAY-U guidelines, exploring possibilities of clubbing nearby slums taken up for in-situ redevelopment (Nagar Nigam Dehradun, 2016). The more recent ADB-financed Uttarakhand Integrated and Resilient Urban Development Project has embedded a specific pro-poor targeting requirement into its infrastructure design, committing to include at least 90 percent of identified poor and vulnerable households among the roughly 12,000 new household sewer connections planned for Dehradun and Haldwani, a more precise and verifiable equity commitment than most of the state's other infrastructure programmes carry.

What remains largely absent from the sources available for this chapter is any current, disaggregated count of Uttarakhand's total slum population or household count updated since the 2011 Census, a gap that compounds the broader Census-currency problem already flagged in section 11.1 and that leaves the state without a reliable baseline against which to measure whether its slum upgrading and in-situ redevelopment efforts are keeping pace with, or

falling behind, the underlying rate of informal urban settlement growth driven by continued hill-to-plains migration.

Urban poverty in Uttarakhand extends beyond the formally enumerated slum population to a wider, harder-to-measure population of seasonal and circular migrant workers, drawn from the state's own hill districts as well as from outside the state, who work in construction, hospitality and the pilgrimage economy without necessarily settling in identifiable slum clusters at all, instead cycling between rented single rooms, worksite accommodation and seasonal return to their home villages. This population is largely invisible to slum-focused urban poverty programming precisely because its housing arrangements do not take the recognisable, spatially concentrated form that slum surveys and in-situ redevelopment planning are designed to identify, meaning that Uttarakhand's PMAY-U and slum-upgrading achievements, real as they are for the populations they reach, likely understate the true scale of urban housing precarity in the state's fastest-growing towns. Extending the same household-level survey methodology used for slum enumeration to seasonal and rental worker populations, particularly around the AMRUT cities and the Char Dham gateway towns where construction and tourism-sector labour demand is highest, would give the state a more complete picture of urban poverty than slum counts alone can provide, and would connect this chapter's findings more directly to the labour market and informal economy themes examined in Chapter 3.6 and 3.7.

Read across its six subsectors, this chapter describes an urban Uttarakhand growing faster and more unevenly than its last full population count can confirm, governed by municipal bodies that raise barely a fifth of what they spend, housed through a national scheme that has reached fewer of its own residents than most comparable states, and improved through national missions whose city-level outcomes are, in Dehradun's case, harder to verify than the state's own published completion figures for AMRUT would suggest they should be. None of this is unique to Uttarakhand among Indian states, but the combination of hill-plains migration pressure, pilgrimage-driven seasonal population multiplication, and Himalayan special-category funding ratios that this framework has documented across Chapters 4, 6 and 10 gives Uttarakhand's version of these familiar urban governance problems its own distinct texture, one that the state's forthcoming State Finance Commission report and its own municipal data systems, rather than national scheme dashboards alone, will need to address directly if the gap between what is announced and what is delivered is to close.

CHAPTER 12: RURAL DEVELOPMENT AND DECENTRALISED GOVERNANCE

12.1 Panchayati Raj Institutions: Structure, Devolution and Capacity

Uttarakhand's rural governance operates through the constitutionally mandated three tier Panchayati Raj structure of Zila Panchayats at the district level, Kshetra Panchayats at the intermediate block level, and Gram Panchayats at the village level, discussed in Chapter 1, with elections to these bodies most recently held in early 2025 alongside the state's urban local body polls (2025 Uttarakhand Local Elections, Wikipedia, 2026). This three tier structure faces distinctive operational challenges in Uttarakhand relative to plains states, since the state's 6,338 village panchayats, referenced in the Rural Development and Migration Commission's own reporting on temporary migration patterns, are scattered across genuinely difficult mountain terrain, meaning that even routine Panchayat administrative functions, convening Gram Sabha meetings, coordinating with block and district level officials, and accessing state and central scheme funding, require considerably more time and logistical effort in Uttarakhand's hill districts than in comparable rural jurisdictions elsewhere in India (Decline in Rate of Migration from Uttarakhand, Tribune India, 2026).

This structural challenge is compounded by the elevated fiscal cost of extending even basic Panchayat administrative infrastructure, office space, record keeping systems, and staff support, across a settlement pattern this dispersed, a consideration this framework connects directly to the local body devolution discussion in Chapter 2, where the elevated per capita cost of extending public administration across Uttarakhand's mountainous terrain was identified as a recurring theme across nearly every sector this framework examines. Panchayat level own revenue generation, already modest across most rural India given the limited tax base available to village level government, is further constrained in Uttarakhand's hill districts by the comparatively low economic activity level and correspondingly narrow local tax base characteristic of villages experiencing the outmigration pressures documented throughout this chapter, creating a self-reinforcing dynamic in which the villages most in need of strengthened local governance capacity are simultaneously those least able to generate the own-source revenue that healthy Panchayati Raj functioning typically depends upon.

The Panchayati Raj Institution structure in Uttarakhand's most severely affected hill districts confronts a particularly acute institutional challenge documented throughout this chapter: the phenomenon of ghost villages, where a Gram Panchayat's nominal jurisdiction may extend over settlements that have become entirely or substantially depopulated. As of the most recent reporting from the state's Rural Development and Migration Commission, the number of villages devoid of human population stood at 1,792, a figure that has risen steadily from 1,053 recorded in the 2011 Census, through 1,564 by January 2018, to 1,768 following the Commission's 2018 report documenting 734 newly depopulated villages between 2011 and 2018 alone (No EVMs, No Polling Parties Sent to 1564 Uttarakhand's Ghost Villages,

Outlook India, 2024; Decline in Rate of Migration from Uttarakhand, Tribune India, 2026). Electoral administration in the state has had to adapt directly to this reality, with the Election Commission specifically not deploying electronic voting machines or polling parties to villages confirmed to have zero remaining population, a practical illustration of how thoroughly the outmigration pattern discussed throughout this framework has reshaped even the most basic functioning of rural governance institutions in the state's hill districts.

Strengthening Panchayati Raj Institution capacity in this context requires a fundamentally different approach than conventional capacity building focused on training elected representatives and providing administrative resources, since no amount of capacity building can restore effective local governance to a Gram Panchayat whose constituent villages have been entirely abandoned. Instead, the state's rural governance strategy must increasingly grapple with the question of Panchayat boundary and jurisdiction reorganisation, potentially consolidating multiple partially or fully depopulated Gram Panchayats into fewer, more viable administrative units, a politically sensitive but administratively necessary conversation this framework raises without attempting to resolve, given the strong attachment hill communities typically retain to their ancestral village's distinct identity even after its population has substantially departed.

This governance challenge is further complicated by the fact that a substantial share of Uttarakhand's Gram Panchayats fall somewhere between the extremes of full vitality and complete depopulation documented above, with a further approximately 650 villages recorded as having their population reduced to below 50 per cent of historical levels, according to the Rural Development and Migration Commission's own assessments (No EVMs, No Polling Parties Sent to 1564 Uttarakhand's Ghost Villages, Outlook India, 2024). These partially depopulated villages present arguably a more complex governance challenge than fully abandoned settlements, since they retain enough residual population to require continued service delivery and democratic representation, yet too little to sustain the kind of community participation, local leadership pool, and own-resource generation that healthy Panchayati Raj functioning typically depends upon, creating a genuine institutional design puzzle for which conventional Panchayati Raj strengthening frameworks, developed with reference to India's more demographically stable rural areas, offer limited direct guidance.

12.2 VB-G RAM-G (Formerly MGNREGA): Coverage, Wage Trends and Livelihood Outcomes

Rural employment guarantee programming in Uttarakhand, as across India, has undergone significant structural transformation with the national transition from the Mahatma Gandhi National Rural Employment Guarantee Act to the Viksit Bharat Guarantee for Rozgar and Aajeevika Mission-Gramin Act, passed by both houses of Parliament on 18 December 2025 and receiving presidential assent on 21 December 2025 (Viksit Bharat-Guarantee for Rozgar and Aajeevika Mission Gramin Act 2025, Wikipedia, 2026). The new Act establishes a statutory guarantee of 125 days of wage employment annually for rural households whose adult members volunteer for unskilled manual work, an increase from the previous 100 day

guarantee, explicitly framed by its long title as aligned with the national Viksit Bharat at 2047 vision and intended to promote empowerment, growth, convergence, and saturation for a prosperous and resilient rural India (Viksit Bharat-Guarantee for Rozgar and Aajeevika Mission Gramin Act 2025, Wikipedia, 2026).

This transition carries particular relevance for Uttarakhand's rural employment guarantee implementation, given the state's own Rural Development Department's continued institutional engagement with employment guarantee grievance redressal mechanisms, evidenced by an MGNREGA-Lokpal meeting recorded as recently as 28 January 2026, suggesting that the state's transition to the new VB-G RAM-G framework was proceeding alongside continued institutional processing of grievances accumulated under the preceding scheme (Homepage, Rural Development Department Uttarakhand, 2026). Given the acute geographic and administrative challenges documented throughout this chapter, particularly the ghost village phenomenon discussed in section 12.1, effective employment guarantee implementation in Uttarakhand's hill districts requires particular attention to ensuring that worksite selection and job card registration genuinely reach the state's remaining, often elderly and predominantly female, hill village populations, discussed in the demographic context of Chapter 1, rather than defaulting to registration and worksite patterns better suited to the state's more populous and accessible plains districts.

The new Act's explicit reorientation toward water security, core rural infrastructure, livelihood assets, and climate resilience as priority investment areas, consistent with the national framework discussed in this framework's companion Rajasthan analysis, carries specific relevance for Uttarakhand given the state's severe disaster risk profile discussed in Chapter 14 and its water security challenges connected to glacial and monsoon dependent hill hydrology discussed in Chapter 10. Employment guarantee funded works focused on slope stabilisation, small check dam construction, and spring shed rejuvenation, all directly relevant to disaster risk reduction and water security in hill terrain, represent a particularly well suited application of this employment guarantee framework's climate resilience priority within Uttarakhand's specific geographic context, offering a potential mechanism for combining livelihood support with genuinely productive local infrastructure investment in a state where conventional road and building construction worksites are not always feasible or appropriate given the terrain and ecological sensitivity discussed throughout this framework.

Given that the demographic composition of the workforce actually available to undertake employment guarantee work in Uttarakhand's hill villages, discussed in section 12.1, skews considerably older and more female than the national average, reflecting the selective outmigration of working age men documented throughout this chapter, the physical nature of worksite tasks assigned under the new scheme requires careful calibration to this specific local workforce profile. Prioritising lighter, skill intensive tasks such as spring shed rejuvenation, nursery development, and small scale water harvesting structure maintenance over more physically demanding earthwork and road construction tasks, wherever technically appropriate, would likely improve both the genuine accessibility and the completion quality of employment guarantee works within the state's most demographically hollowed out hill

villages, an adaptation this framework recommends the state's implementing agencies consider explicitly rather than applying national worksite selection norms uniformly regardless of local workforce composition.

Wage payment reliability and timeliness represent a further important dimension of effective employment guarantee implementation specific to Uttarakhand's banking and digital infrastructure context, discussed in Chapter 16, since Direct Benefit Transfer payment mechanisms depend on reliable rural banking access and correspondingly reliable telecommunications connectivity for payment confirmation and grievance redressal, both of which remain considerably less consistent in the state's remote hill districts than in its plains areas. Ensuring that the transition to the new VB-G RAM-G payment architecture does not inadvertently disadvantage precisely the hill village workers this scheme is intended to serve, by assuming a level of banking and digital access that many of the state's most remote worksite participants do not reliably possess, represents an important implementation safeguard the state's Rural Development Department should build explicitly into its transition planning, potentially through continued availability of cash based payment fallback mechanisms in areas where digital payment infrastructure remains genuinely unreliable.

12.3 Rural Housing: PMAY-Gramin and State Schemes

Rural housing delivery in Uttarakhand operates through the central government's Pradhan Mantri Awaas Yojana-Gramin, which the Ministry of Rural Development has extended for implementation across the 2024-25 to 2028-29 period following Union Cabinet approval, targeting construction of an additional 2 crore rural houses nationally beyond the 2.95 crore houses targeted under the scheme's original phase through March 2024, of which more than 2.94 crore had already been sanctioned and over 2.55 crore completed as of February 2024 (Achievement of Targets Under PMAY-G, Ministry of Rural Development, 2025; Targets of Pradhan Mantri Awaas Yojana-Gramin, Ministry of Rural Development, 2024). Housing construction under this scheme in Uttarakhand's hill districts confronts materially higher per-unit costs than in plains states, given the transport cost of construction materials to remote mountain sites, discussed in the logistics context of Chapter 8, and the additional structural engineering considerations that seismic risk and steep slope construction, discussed in Chapter 14, impose on rural housing design in a manner not faced by beneficiaries in flatter terrain.

Complementing this central scheme, the state government's Mukhya Mantri Adarsh Gram Yojna pursues a more holistic rural development approach explicitly linking housing improvement to broader village infrastructure upgrading, encompassing healthcare facilities, sanitation, drinking water resources, and education access within a single integrated village development framework, rather than addressing housing in isolation from the other infrastructure gaps that continue to drive the outmigration pattern documented throughout this chapter (Ghost Villages, Abandoned Lives, The Mooknayak, 2023). This integrated approach reflects a reasonable policy judgment that rural housing improvement alone, absent complementary investment in the healthcare, education, and connectivity infrastructure discussed in Chapters 5, 6, and 8, is unlikely to meaningfully affect a hill household's

underlying decision whether to remain in or depart from their home village, since housing quality has historically ranked below employment opportunity, healthcare access, and children's education access among the migration drivers the state's Rural Development and Migration Commission has documented.

Given the direct connection between housing quality and the broader village viability challenge discussed in section 12.1, prioritising PMAY-Gramin and Mukhya Mantri Adarsh Gram Yojna investment specifically within villages assessed as having genuine prospects for demographic stabilisation or reverse migration, discussed further in section 12.6, rather than distributing housing investment uniformly across all rural settlements regardless of their long-term population trajectory, represents an important targeting consideration for the state's rural housing policy, ensuring that scarce housing investment resources are not directed toward villages already on an irreversible path toward the ghost village status documented throughout this chapter.

A further, genuinely distinctive dimension of rural housing policy in Uttarakhand concerns the fate of housing stock in villages that have already become partially or fully depopulated, discussed in section 12.1, where traditional multi-storey stone and timber hill houses, often decades old and architecturally significant, stand vacant and gradually deteriorating rather than being demolished or actively maintained. Rather than treating this substantial existing housing stock as simply a byproduct of the outmigration crisis to be documented, the homestay tourism revival strategy discussed in section 12.6 offers a genuinely promising adaptive reuse pathway, converting exactly this category of vacant traditional housing into tourism accommodation rather than either allowing it to fall into permanent disrepair or requiring entirely new construction under conventional rural housing schemes, a connection between housing policy and tourism policy that this framework treats as an underexploited synergy within the state's current rural development architecture.

This adaptive reuse approach carries a further advantage worth making explicit: converting existing vacant traditional housing into homestay accommodation typically requires considerably lower capital investment than new construction under conventional rural housing schemes, since the underlying structure, often built using traditional stone and timber techniques well adapted to local seismic and climatic conditions, discussed in Chapter 1, already exists and requires renovation and basic hospitality amenity addition rather than entirely new foundation and structural work. This cost efficiency consideration, combined with the cultural heritage preservation value of maintaining rather than replacing traditional hill architecture, discussed further in the cultural heritage context of Chapter 19, provides additional practical justification for the state's rural housing and tourism departments to coordinate more closely than they have historically done, treating vacant traditional housing stock as a genuine development asset rather than merely a visible symptom of the outmigration crisis this chapter has documented throughout.

12.4 Livelihood Promotion: SHGs, Cooperatives and Rural Enterprise

Rural livelihood promotion in Uttarakhand operates through the national Deendayal Antyodaya Yojana-National Rural Livelihoods Mission framework, under which all eligible rural poor households are identified and mobilised into Self-Help Groups, complemented by the mission's continued emphasis on gender mainstreaming, reflected in national conclave programming conducted in partnership with international gender equality research institutions (Government on Course to Achieve Targets Under Rural Housing Programme, Ministry of Rural Development, 2025). Given the substantial feminisation of Uttarakhand's hill village population discussed in Chapter 1, a direct consequence of the outmigration pattern documented throughout this chapter, Self-Help Group based livelihood promotion carries particular strategic significance for the state, since the women who remain in hill villages after their working age male family members have migrated represent both the primary custodians of hill agricultural and pastoral livelihoods and the population segment for whom alternative income generation opportunities are most urgently needed.

This gendered dimension of Uttarakhand's rural livelihood challenge deserves explicit emphasis, since it distinguishes the state's Self-Help Group strategy from the more conventional national framing of women's economic empowerment as one objective among several within rural livelihood promotion. In Uttarakhand's hill districts specifically, women are frequently not merely important participants in the rural economy but, given the outmigration patterns documented throughout this chapter, the primary or sole remaining adult economic actors in a substantial share of hill households, meaning that Self-Help Group effectiveness in the state carries a correspondingly larger share of the total burden for sustaining hill livelihoods than the same institutional model typically carries in states where male out-migration is less pronounced. This elevated stakes context should inform the intensity and priority of resource allocation the state directs toward its Self-Help Group infrastructure relative to other rural livelihood promotion instruments.

The Rural Development and Migration Commission's own findings regarding the recent deceleration in permanent outmigration, discussed further in section 12.6, specifically attribute this positive trend to increasing local inclination toward self-employment opportunities in fisheries, poultry, and dairy farming, sectors that Self-Help Group based livelihood promotion and cooperative institutions are well positioned to support through group based access to credit, training, and market linkages that individual smallholder households would struggle to access independently (Decline in Rate of Migration from Uttarakhand, Tribune India, 2026). This finding provides genuine empirical grounding for prioritising continued expansion of Self-Help Group coverage and livelihood diversification support specifically within Uttarakhand's hill districts, since it suggests that livelihood promotion interventions of exactly this kind are already demonstrably associated with reduced permanent outmigration, a rare instance within this framework's rural development analysis of a policy lever with directly observable impact on the state's central demographic challenge.

Private and civil society led rural enterprise initiatives complement this government led livelihood promotion architecture, exemplified by ventures such as Pathal Agropducts, established by a retired army officer and his wife specifically to stem outmigration from their home region through local agricultural value addition enterprise, illustrating that livelihood promotion in Uttarakhand's hill districts is not solely a government function but increasingly draws on a broader ecosystem of private, cooperative, and civil society actors working toward the shared objective of rural livelihood diversification and reverse migration discussed throughout this chapter (Populating Ghost Towns, IndiaSpend, 2022). Strengthening formal linkages between these private and civil society initiatives and the state's own Self-Help Group and cooperative infrastructure would allow successful models such as this to scale beyond individual pilot ventures into a more systematic component of the state's broader rural livelihood promotion strategy.

Cooperative institutions specific to Uttarakhand's traditional hill economy, particularly dairy cooperatives building on the state's pastoral heritage discussed in Chapter 1, and increasingly, horticultural marketing cooperatives supporting the fruit and off-season vegetable production that Uttarakhand's temperate hill climate favours relative to India's plains states, discussed further in Chapter 18, represent a further important institutional channel for rural livelihood promotion. Expanding cooperative processing capacity for hill grown produce, allowing farmers to capture a greater share of final product value rather than selling raw, unprocessed output at comparatively low farm gate prices, represents a meaningful opportunity to improve the income proposition of remaining in hill agriculture, directly relevant to the reverse migration objectives discussed throughout this chapter.

12.5 Rural Infrastructure: PMGSY, Connectivity and Market Linkages

Rural road connectivity in Uttarakhand is delivered through the Pradhan Mantri Gram Sadak Yojana, implemented within the state by the dedicated Uttarakhand Rural Roads Development Agency, established specifically to implement the scheme under the guidance and technical norms set by the National Rural Road Development Agency (Homepage, Uttarakhand Rural Road Department Agency, 2026). The scheme marked its twenty fifth national anniversary on 25 December 2025, having sanctioned over 8.25 lakh kilometres of rural roads nationally since its December 2000 launch, of which more than 7.87 lakh kilometres have been completed, with approximately Rs 19,000 crore allocated nationally for the 2025-26 financial year alone, reflecting the scheme's continued central role in rural connectivity policy a quarter century after its introduction (Pradhan Mantri Gram Sadak Yojana Marks 25 Years, News on Air, 2025).

The near exact coincidence between the Pradhan Mantri Gram Sadak Yojana's twenty fifth anniversary in December 2025 and Uttarakhand's own twenty fifth anniversary of statehood, discussed in Chapter 2's budget analysis, offers a natural point of reflection on the scheme's cumulative contribution to the state's rural transformation over precisely the period of Uttarakhand's existence as an independent state. Given that the original hill statehood movement discussed in Chapter 1 was substantially motivated by the perception that undivided Uttar Pradesh had systematically underinvested in hill area road connectivity

relative to the plains, the Pradhan Mantri Gram Sadak Yojana's sustained twenty five year investment within the state represents, in a meaningful sense, a direct policy response to one of the founding grievances underlying Uttarakhand's creation, even though the scheme itself operates as a national rather than Uttarakhand specific programme.

An Indian Institute of Management Ahmedabad study specifically examining the scheme's outcome monitoring across a set of states including Uttarakhand found that construction of Pradhan Mantri Gram Sadak Yojana roads was able to bring about socio-economic change in the lives of the rural poor comparable to, and in some cases exceeding, that experienced by other sections of society, providing empirical validation specific to Uttarakhand's own inclusion in this multi-state evaluation for the scheme's broader development impact beyond simple transport access alone (Status of PMGSY Roads, Ministry of Rural Development, 2025). Given the direct connection between road connectivity and village viability discussed throughout this chapter, continued Pradhan Mantri Gram Sadak Yojana investment within Uttarakhand's hill districts represents one of the most evidence backed rural infrastructure interventions available to the state, carrying demonstrated potential to influence the very outmigration pattern that this chapter has identified as the central challenge facing the state's rural development strategy.

Market linkage infrastructure connecting the state's hill agricultural and horticultural producers, discussed in Chapter 18, to urban consumption markets represents an essential complement to basic road connectivity, since improved road access alone does not guarantee that hill farmers can capture fair value for perishable produce without correspondingly accessible market infrastructure and, increasingly, the cold chain logistics discussed in Chapter 8. Integrating the Pradhan Mantri Gram Sadak Yojana's continued rural road expansion with targeted market linkage and cold storage investment specifically along routes connecting the state's horticultural production zones to its plains urban centres would strengthen the direct economic return hill households receive from improved connectivity, reinforcing the livelihood diversification priorities discussed in section 12.4.

Rural electrification and telecommunications infrastructure, while formally falling outside the Pradhan Mantri Gram Sadak Yojana's specific road focused mandate, represent an equally essential dimension of the connectivity discussed throughout this chapter, particularly given the mobile network coverage gaps documented in the tourism context of Chapter 19, where signal reliability becomes very unreliable above key hill towns such as Joshimath, Gaurikund, and Barkot. Extending reliable telecommunications infrastructure alongside continued road expansion, rather than treating physical and digital connectivity as separate infrastructure priorities, would strengthen both the emergency response capability discussed in the disaster risk context of Chapter 14 and the digital livelihood and e-commerce market access opportunities increasingly relevant to the Self-Help Group and cooperative enterprise development discussed in section 12.4.

12.6 Community-Based Development Institutions and Participatory Planning

Uttarakhand's most distinctive contribution to community-based rural development institution design is its Rural Development and Migration Commission, established in August 2017 specifically to study the state's persistent outmigration challenge and evolve a focused vision for hill area rural development, chaired by the Chief Minister himself with Vice-Chairman S.S. Negi providing the Commission's principal analytical and field research leadership (Populating Ghost Towns, IndiaSpend, 2022). This Commission represents a genuinely novel institutional response among Indian states, dedicating sustained, chief minister led institutional attention specifically to the demographic and rural viability crisis documented throughout this chapter, rather than treating outmigration as a secondary consideration within conventional rural development departmental structures.

The Commission's establishment in 2017, more than fifteen years after Uttarakhand's formation, reflects an important, if somewhat delayed, institutional acknowledgement that the outmigration challenge motivating the original hill statehood movement, discussed in Chapter 1, had not been resolved by statehood itself and instead required dedicated, ongoing institutional monitoring and policy development distinct from the state's conventional rural development departmental structure. That the Commission continues to operate under the direct chairmanship of successive Chief Ministers, rather than being delegated to a subordinate departmental official, signals a level of sustained political priority for the outmigration issue that few other Indian states extend to any single demographic or rural development challenge, a institutional design choice this framework regards as a genuine strength of Uttarakhand's rural governance architecture worth highlighting as a potential model for other hill and mountain states confronting comparable demographic pressures.

The Commission's periodic reporting has provided this framework, and Uttarakhand's broader policy community, with some of the most granular available data on rural demographic change in any Indian state, including its finding that permanent outmigration declined markedly from 1,18,981 people during 2008 to 2018 to just 28,531 people during the subsequent period through September 2022, a deceleration the Commission's Vice-Chairman attributes specifically to growing local uptake of self-employment opportunities in fisheries, poultry, and dairy farming discussed in section 12.4, even as temporary, within-state migration has continued at a pace the Commission projects could double over the following five years if current trends persist (Decline in Rate of Migration from Uttarakhand, Tribune India, 2026). This combination of declining permanent outmigration alongside continued or rising temporary migration suggests a genuinely evolving pattern, one in which hill residents increasingly seek to maintain their village based identity and land connection while still accessing employment and services in nearby towns on a circulating rather than permanently relocating basis, a distinction with important implications for how the state's rural development strategy, discussed throughout this chapter, should be designed.

The Commission's Vice-Chairman has specifically characterised this rising temporary migration as a lesser cause for policy concern than permanent migration, on the reasoning that temporary, within-district or within-state migration allows hill residents to retain their

village connection, land, and eventual return prospects in a way that permanent departure does not (Decline in Rate of Migration from Uttarakhand, Tribune India, 2026). This framework treats this characterisation as broadly reasonable but incomplete, since even temporary migration at the scale the Commission projects, potentially doubling to six lakh people over a five year period, carries genuine implications for the day to day functioning of the hill villages such migrants depart from, including reduced availability of working age labour for agricultural and Panchayati Raj civic participation during the periods migrants are away, even if the underlying household maintains its formal village residence and eventual return intention.

Building on this Commission's analytical foundation, the state government's more recent Governor led initiative to transform ghost villages into host villages through sustainable homestay tourism, announced in late 2025 and explicitly integrating agriculture, ecology, and tourism within a single rural revival framework, represents a promising, if still early stage, participatory planning approach that encourages villagers themselves to convert traditional hill homes into guest accommodation, emphasising low-impact practices including organic farming, rainwater harvesting, and renewable energy use (India's Uttarakhand Charts a New Path, Travel and Tour World, 2025). This homestay tourism initiative connects directly to the Mukhya Mantri Gramya Paryatan Vikas Yojna discussed in section 12.3, and to the broader rural tourism opportunities discussed in Chapter 19, offering villages that have not yet crossed the threshold into complete depopulation a genuine, locally controlled economic alternative to the outmigration pattern that has already claimed 1,792 of the state's villages entirely.

The initiative's launch at the Uttarakhand Horticulture and Forestry University's Ranichauri campus, during the fourteenth Brainstorming Session of the Indian Agricultural Universities Association, further signals an intention to ground this homestay revival strategy in genuine agricultural and ecological science rather than treating it as a purely tourism marketing exercise disconnected from the underlying land and livelihood realities of the villages it targets. This academic grounding matters considerably given the participatory planning principle this framework has emphasised throughout, discussed in the broader public participation context of Chapter 20, since rural revival strategies imposed from outside a community, however well intentioned, have historically proven less durable than those genuinely co-designed with the residents whose land, homes, and daily lives the strategy is meant to transform.

Sustaining and scaling this participatory, community-led model, informed by the continued research and monitoring capacity of the Rural Development and Migration Commission, represents the most promising available pathway for Uttarakhand to genuinely reverse, rather than merely document, the rural demographic crisis that has defined the state's rural development challenge since its formation in 2000. Taken together, the institutional architecture examined throughout this chapter, spanning the Panchayati Raj structure discussed in section 12.1, the newly transitioned employment guarantee framework discussed in section 12.2, integrated housing and infrastructure schemes discussed in section 12.3,

gender centred livelihood promotion discussed in section 12.4, evidence backed road connectivity investment discussed in section 12.5, and the genuinely distinctive migration monitoring and homestay revival institutions discussed in this section, collectively represents a rural development strategy considerably more tailored to Uttarakhand's specific hill demographic crisis than a generic, nationally uniform rural development template could provide, even as the scale of the underlying challenge, nearly 1,800 entirely abandoned villages and counting, means that the ultimate success of this strategy remains genuinely uncertain and will require sustained.

Chapter 13: Environment and Natural Resource Governance

Uttarakhand's natural resource base is simultaneously its greatest asset and its most persistent governance challenge. A state where forest, water and mineral wealth sit directly upstream of hundreds of millions of people in the Gangetic plains carries an ecological responsibility that extends well beyond its own 1.20 crore residents, a responsibility this framework's earlier chapters have already touched from several angles, the hydropower dependence and Chamoli disaster risk discussed in Chapter 9, the child nutrition and forest rights findings discussed in Chapter 7, and the hill terrain cost burden that recurs throughout the education, energy and social justice chapters alike. This chapter draws these threads together directly, examining six dimensions of how Uttarakhand's environmental responsibility is being discharged, forest cover and wildlife conservation, land use change and soil degradation, water bodies and river ecosystem health, mining and mineral resource governance, pollution across air, water, noise and soil, and finally a brief accounting of coastal and marine resource management, a domain this landlocked Himalayan state does not directly possess.

13.1 Forest Cover, Biodiversity and Wildlife Conservation

Uttarakhand is, by national standards, a heavily forested state. The most recent detailed state level assessment places forest cover at 24,303.04 square kilometres, or 45.44 percent of the state's total geographical area of 53,483 square kilometres, comprising 5,046.76 square kilometres of Very Dense Forest, 12,805.24 square kilometres of Moderately Dense Forest and 6,451.04 square kilometres of Open Forest, a modest increase of 8.04 square kilometres over the previous assessment cycle attributed mainly to plantation and conservation activity (Forest Survey of India, 2019). The state's Recorded Forest Area totals 38,000 square kilometres, of which reserved forests account for 69.86 percent, protected forests 26.01 percent and unclassified forests the remaining 4.13 percent, and between January 2015 and February 2019 alone, 2,850.87 hectares of forest land were diverted for non forestry purposes under the Forest Conservation Act, 1980 (Forest Survey of India, 2019). Six national parks, seven wildlife sanctuaries and four community reserves make up the state's protected area network, together covering 3.24 percent of Uttarakhand's geographical area (Forest Survey of India, 2019).

Corbett National Park, established in 1936 and spanning 1,288.34 square kilometres across Pauri and Nainital districts, is India's oldest national park and the anchor of the state's wildlife conservation record (ETV Bharat, 2023). The 2022 national tiger census recorded 560 tigers in Uttarakhand, the third highest state total in the country behind Madhya Pradesh and Karnataka, and a 314 percent increase from the 178 tigers recorded in 2006, of which 260 reside within Corbett Tiger Reserve alone, the single largest tiger population of any reserve in India (ETV Bharat, 2023; Drishti IAS, 2026). This conservation success has its own costs, senior wildlife scientists have noted that tigers historically ranging across roughly 40 square kilometres in Corbett are now confined to territories as small as 8 square kilometres as the population has grown, driving rising human wildlife conflict and tiger mortality, with 181 tiger deaths recorded in Uttarakhand since the state's formation in 2000, including 18 in a

single nine month period in 2023, 16 of them in and around Corbett (ETV Bharat, 2023). Elephant numbers have followed a broadly similar upward trajectory, the state's elephant population rose from 1,559 in the 2012 census to 1,797 in 2015, a 15 percent increase, with the Corbett landscape and neighbouring Rajaji National Park, which alone recorded 309 elephants in 2015, together hosting the bulk of the state's herd (Tribune India, 2015).

Set against these conservation gains, forest fire has emerged as an acute and rapidly worsening threat. In the 2023 to 2024 fire season, satellite monitoring recorded 21,033 fire hotspots in Uttarakhand between November 2023 and June 2024, compared with 5,351 in the equivalent period a year earlier, a 74 percent rise that pushed the state from thirteenth to first place nationally in fire incidence, with a total of 1,808.9 square kilometres of forest area affected (Tribune India, 2024). The Forest Survey of India's 18th India State of Forest Report, released at the Forest Research Institute in Dehradun in December 2024, confirmed Uttarakhand as one of the three worst affected states for forest fire nationally, alongside Odisha and Chhattisgarh, even as the same report recorded Uttarakhand's forest growing stock at 400.02 million cubic metres, the second highest of any Indian state after Arunachal Pradesh (Shankar IAS Parliament, 2024). The juxtaposition of rising fire incidence against a genuinely large and valuable standing forest stock makes fire management, rather than afforestation alone, the more urgent frontier for the state's forest department over the remainder of this decade.

Beyond Corbett, the state's protected area network includes two further sites of international standing. The Nanda Devi National Park and the adjoining Valley of Flowers National Park together form the Nanda Devi Biosphere Reserve and were jointly inscribed as a UNESCO World Heritage Site in 1988, recognised for an altitudinal range that shelters snow leopard, Himalayan musk deer and one of the richest alpine flower meadows in the world, a designation that places a binding international conservation expectation on the state alongside its purely domestic protected area obligations (UNESCO World Heritage Centre, n.d.). Rajaji National Park, straddling the Shivalik foothills across Dehradun, Haridwar and Pauri Garhwal districts, forms the second major tiger and elephant landscape in the state after Corbett, and its 2015 elephant count of 309 animals, together with its more recent status as the subject of the Eco Sensitive Zone mining dispute discussed in section 13.4, illustrates that the pressure on the state's protected areas is no longer confined to its single best known reserve. Taken together, these three landscapes, Corbett, Rajaji and Nanda Devi, mean that Uttarakhand carries conservation obligations that are simultaneously domestic, constitutional and international in character, a layering of accountability that should inform how the state prioritises fire management, mining enforcement and human wildlife conflict mitigation funding across its protected area network rather than concentrating resources on whichever site attracts the most immediate media attention. It is this same layering that makes the forest fire trend documented above so consequential, since a fire season severe enough to burn 1,808.9 square kilometres of forest does not respect the administrative boundary between a UNESCO listed biosphere reserve, a national tiger reserve and unprotected reserved forest, meaning fire preparedness investment decided at the level of an individual protected area risks leaving the connecting forest corridors between Corbett, Rajaji and the state's other

reserves comparatively under resourced even as the flagship sites themselves receive priority attention.

13.2 Land Use Change, Soil Degradation and Land Resource Management

Uttarakhand's land resource base is shaped first and foremost by slope. With roughly 86 percent of its total area classified as hilly terrain, the state's land use options are narrower, and the consequences of land use change more severe, than in almost any plains state. A Geological Survey of India assessment released in August 2025 identified 14,780 active landslide zones across the 39,009 square kilometres of the state that has been surveyed in detail, the third highest count of any Indian state after Arunachal Pradesh and Himachal Pradesh, and found that 22 percent of these zones fall into the highly sensitive category, compared with a national average of 15 percent, with the survey noting that a further 80 to 100 new landslide zones are typically identified in every monsoon season (ETV Bharat, 2025). This vulnerability was made starkly visible in August 2025, when a cloudburst triggered a flash flood that buried the village of Dharali and disrupted connectivity to the Gangotri Dham pilgrimage route in the middle of the Char Dham Yatra season, one of a growing number of extreme rainfall events that geological and meteorological agencies increasingly link to a combination of unstable Himalayan geology and shifting precipitation patterns (Wikipedia, 2025).

Soil erosion compounds this landslide vulnerability in ways that affect agricultural productivity as much as disaster risk. A geospatial modelling study using the Revised Universal Soil Loss Equation estimated the state's average annual soil erosion rate at 27.45 tonnes per hectare per year, equivalent to approximately 119 million tonnes of potential soil loss across the state annually, with erosion rates rising sharply with slope, from 4.76 tonnes per hectare per year on gentle slopes to 40.11 tonnes per hectare per year on slopes exceeding 60 percent (Ghosh et al., as cited in ScienceDirect, 2021). A separate basin specific study of the Alaknanda catchment in Chamoli district found an average annual soil loss of 28.45 tonnes per hectare per year, above the 25 tonne per hectare per year threshold generally treated as the permissible limit for young mountain environments, underscoring that soil degradation in the state's more vulnerable catchments has already crossed into ecologically unsustainable territory rather than remaining a future risk (ResearchGate, 2021). Researchers attribute this pattern to a combination of weak, tertiary sedimentary geology that detaches easily under intense rainfall, and land use change, principally the conversion of dense forest into degraded, thinly stocked fallow land and the expansion of unplanned settlement and infrastructure, that removes the root systems and canopy cover that would otherwise stabilise hill slopes (Scroll.in, 2018). Reversing this trend will require the same kind of district disaggregated monitoring this framework has recommended in earlier chapters, since a state average erosion figure, however alarming, cannot by itself tell land use planners which specific watersheds most urgently need afforestation, terracing or construction restrictions.

Infrastructure expansion has become an increasingly significant driver of land use change in its own right, most visibly through the Char Dham All Weather Road project, a national

highway widening programme intended to improve connectivity to the four major pilgrimage shrines that has involved extensive hill cutting, slope destabilisation and, in places, the removal of vegetation on already landslide prone terrain. The project's environmental footprint became significant enough to draw direct Supreme Court oversight, with the Court appointing a high powered committee, chaired by environmental scientist Ravi Chopra, to examine whether the roads could be built to a narrower, more slope stable specification without compromising the strategic and pilgrimage connectivity objectives the project was designed to serve. The tension this project embodies, between the state's tourism and strategic connectivity priorities discussed in Chapters 8 and 19 and the soil and slope stability concerns documented in this section, is a recurring structural feature of Uttarakhand's land use governance, since almost every major infrastructure decision in the state's hill districts now carries a landslide and erosion risk dimension that plains state infrastructure planning simply does not have to weigh in the same way.

Land use planning capacity in the state has not, on the evidence reviewed for this chapter, kept pace with this rising infrastructure and climate pressure. State level, consolidated data on the total area under agriculture, permanent fallow, wasteland and built up use, updated on a regular cycle and cross referenced against the landslide susceptibility and soil erosion mapping described above, was not available in a single authoritative source reviewed here, meaning the state's own land use decisions, whether for new road alignments, hydropower access tracks discussed in Chapter 9, or expanding settlements, are more likely being made against fragmented rather than integrated risk data, a gap this framework's Chapter 14 disaster risk reduction discussion returns to directly.

13.3 Water Bodies, Wetlands and River Ecosystem Health

Uttarakhand's river systems carry a significance out of proportion to the state's own size, since the Ganga and Yamuna, two of India's most important rivers, both rise within its borders before flowing on to sustain the country's most densely populated plains. Within the state itself, wetlands cover approximately 103,882 hectares, or 1.94 percent of Uttarakhand's total geographical area, and include 118 high altitude lakes covering a further 231 hectares, a genuinely distinctive freshwater ecosystem profile for a Himalayan state (e-IJEP, 2025). The state's sole Ramsar designated Wetland of International Importance is the Asan Conservation Reserve, a 444.4 hectare freshwater wetland at the confluence of the Asan River and the Yamuna canal in Dehradun district, notified as a Conservation Reserve in August 2005 and recognised as a Ramsar site after meeting five of the nine international criteria, including support for rare and threatened species, overall biological diversity, and hosting more than one percent of a migratory waterbird population during critical life cycle stages (Ramsar Convention Secretariat, 2010; UPSC Tree, 2021). Even this flagship site faces mounting pressure, recent ecological assessments have identified agricultural runoff, pollution, habitat modification and increasing tourism and boating activity as active threats to the wetland's water quality and biodiversity, monitored in part through periphyton based bioindicator studies that research teams have used to track the site's ecological health between 2021 and 2023 (Frontiers in Environmental Chemistry, 2025).

Beyond this single Ramsar site, the state's approach to river ecosystem health is inseparable from the mining and pollution pressures discussed in sections 13.4 and 13.5, since riverbed extraction, untreated urban discharge and pilgrimage related waste all act directly on the same river systems whose glacial headwaters and forest fed tributaries this section has described. A state that hosts the source of two of India's most sacred and economically vital rivers carries a governance responsibility that is, in an important sense, larger than the wetland acreage or lake count captured in the state's own conservation statistics, and the coherence of Uttarakhand's river governance should ultimately be judged against downstream water quality and flow outcomes in the plains states, discussed further in this framework's chapters on Uttar Pradesh and Bihar's own environmental governance, rather than solely against the condition of protected sites within Uttarakhand's own borders.

Uttarakhand is one of five states, alongside Uttar Pradesh, Bihar, Jharkhand and West Bengal, covered under the Union Government's Namami Gange programme, the national mission for Ganga rehabilitation whose activities in the state include sewage treatment plant construction, riverfront development, river surface cleaning, biodiversity conservation and afforestation along the river corridor (Forest Survey of India, 2019). Because Uttarakhand sits at the very head of this five state programme, the state's own sewage treatment capacity in towns such as Haridwar and Rishikesh has an outsized influence on the baseline water quality that every downstream Namami Gange investment in Uttar Pradesh, Bihar, Jharkhand and West Bengal must then work to maintain or improve, meaning any shortfall in the state's own treatment infrastructure is effectively exported, at only modestly diluted concentration, to four further states and tens of millions of additional residents. A further water body category deserving explicit mention, though not captured in the wetland inventory discussed above, is the state's high altitude glacial lakes, whose sudden failure, as the Chamoli disaster examined in this framework's Chapter 9 energy discussion demonstrated in February 2021, represents a water body risk category entirely distinct from the pollution and encroachment pressures affecting Asan and the state's lower altitude wetlands, and one that this section's wetland inventory, focused as it is on conservation reserves and lake area, does not currently integrate into a single, state wide water body risk register.

13.4 Mining and Mineral Resource Governance

Riverbed mining, the extraction of sand, gravel and boulders from the state's riverbeds for construction use, is the dominant and most contested form of mineral resource extraction in Uttarakhand, and the state's own regulatory history shows a persistent tension between conservation intent and commercial pressure. In 2001, the state's Minor Mineral Concession Rules permitted riverbed material extraction to a depth of 1.5 metres, a limit the government later doubled to 3 metres under a policy framed as Sustainable Sand Mining, a change conservationists at the time argued was less about sustainability than about accommodating rising extraction volumes (South Asia Network on Dams, Rivers and People, 2020). A 2021 government audit found that state agencies had allowed contractors to remove an estimated 37.17 lakh metric tonnes of riverbed material without the transit passes legally required to track such extraction, and separate investigative reporting has documented that the state

government subsequently outsourced both royalty collection and illegal mining enforcement to private companies, an arrangement in which a mining company can simultaneously profit from extraction and be responsible for policing extraction by others, a structure independent observers have characterised as a conflict of interest (Reporters' Collective, 2025). Compliance with a Supreme Court requirement that riverbed mining proceeds be reinvested in forest conservation and river training has also been inconsistently met, with state agencies at points attempting to reduce afforestation allocations before being directed by the relevant central forest committee to restore them (National Herald, 2023).

More recent enforcement activity suggests at least partial course correction. In May 2025, the Uttarakhand High Court ordered an immediate halt to illegal sand mining along the Kosi River in Bazpur tehsil after a public interest petition alleged extraction inside a reserved forest at night, extraction that had reportedly escalated to violence against forest officials attempting to intervene (Down To Earth, 2025). More significantly, in early 2026 the Standing Committee of the National Board for Wildlife declined to approve 19 separate mining proposals falling within the default Eco Sensitive Zones of the Rajaji Tiger Reserve and the Benog Wildlife Sanctuary, acting in response to a November 2025 Supreme Court directive requiring formal notification of Eco Sensitive Zones around all tiger reserves, including buffer and fringe areas, within one year (The Tribune, 2026). That the state was still submitting a piecemeal stream of sand and boulder mining proposals in and around a tiger reserve as recently as early 2026, only for a national wildlife body to reject all 19 in a single sitting, illustrates how far the gap between the state's own mineral revenue incentives and its conservation and forest governance obligations, discussed in section 13.1, remains from being closed through routine administrative practice alone, and suggests that the pending Eco Sensitive Zone notifications the Supreme Court has now mandated will be a genuine test of the state's regulatory seriousness over the coming year.

This tension between mineral revenue and ecological protection in the state's mining sector is not a recent development. Limestone quarrying in the Doon Valley through the 1950s to 1980s, which stripped hillsides above Dehradun and Mussoorie of vegetation and disrupted the valley's natural aquifer recharge zones, became the subject of Rural Litigation and Entitlement Kendra v. State of Uttar Pradesh, filed before the Supreme Court in 1983 by a Dehradun based non governmental organisation and decided in a series of orders from 1985 onward that appointed an expert committee to classify the valley's limestone quarries by environmental impact and progressively ordered the closure of the most damaging category (Legal Bites, 2023; Record of Law, 2025). Reported as one of the earliest Indian cases to hold that environmental protection forms part of the constitutional right to life, the case predates Uttarakhand's own statehood by 15 years, since Doon Valley was then still part of Uttar Pradesh, but it remains the foundational precedent shaping how Indian courts, including the Uttarakhand High Court rulings on the Kosi and Nandhaur rivers discussed above, approach mining disputes in the state's fragile hill terrain today. That the state's mining governance challenges have shifted over four decades from hillside limestone quarrying above Dehradun to riverbed sand and boulder extraction across its Terai rivers, while remaining structurally similar in the underlying pattern of revenue pressure overriding environmental clearance

processes until court intervention forces compliance, suggests the underlying institutional weakness lies less in any single mineral or location and more in the state's mining permission and enforcement architecture itself, a diagnosis the 2021 transit pass audit finding and the 2025 and 2026 court and wildlife board interventions described above both tend to confirm.

13.5 Pollution, Air, Water, Noise and Soil, Status and Regulatory Response

Air quality in Uttarakhand varies sharply between its hill and plains districts, a pattern consistent with the industrial and traffic sources concentrated in the Terai belt. Real time monitoring places Haridwar as the state's most polluted district, with forecast PM_{2.5} concentrations around 80 micrograms per cubic metre, a level classified as moderately polluted and well above World Health Organization clean air guidelines, while Dehradun has generally recorded more moderate readings, with an Air Quality Index around 75 and PM_{2.5} concentrations closer to 23 micrograms per cubic metre in mid 2026 (AirPollution.io, 2026; AQI.in, 2026). The Uttarakhand Environment Protection and Pollution Control Board regulates industrial emissions through a red, orange, green and white classification system for industrial sectors and administers waste specific rules covering plastic, battery and electronic waste alongside newer guidance on recycling waste tyres into pyrolysis oil, reflecting a regulatory architecture that has expanded considerably in scope even as ambient air quality in the state's plains districts remains a persistent, largely unresolved problem (Uttarakhand Pollution Control Board, 2025).

Water pollution in the state's major rivers is closely tied to the sewage treatment gap discussed in section 13.3, since untreated or partially treated municipal discharge from towns along the Ganga and its tributaries, particularly around Haridwar and Rishikesh, remains the dominant source of organic and bacteriological contamination measured against Central Pollution Control Board river water quality standards, a pressure that intensifies sharply during the Char Dham Yatra and Kumbh Mela seasons discussed below, when the resident population of these towns is temporarily multiplied several times over by pilgrim inflows that existing sewage infrastructure was not sized to handle. Noise pollution, while less systematically monitored than air or water quality in the sources reviewed for this chapter, is a recognised seasonal problem along the state's main pilgrimage corridors, where the combination of continuous vehicular traffic, loudspeaker use at religious sites and construction activity associated with the road widening discussed in section 13.2 concentrates noise exposure in narrow valley corridors where sound carries and disperses differently than in open plains terrain, though state specific ambient noise monitoring data for these corridors was not available in the sources consulted here, a further instance of the monitoring gap this chapter has identified repeatedly across its preceding sections.

The state's most distinctive pollution challenge, however, is neither industrial nor purely urban, it is generated by the sheer scale of religious tourism the Char Dham Yatra and the periodic Kumbh Mela in Haridwar bring to a fragile Himalayan environment. Uttarakhand's urban areas generate approximately 3,000 metric tonnes of solid waste daily under ordinary conditions, a figure that rises sharply during the Yatra season, when environmental

researchers estimate that an individual pilgrim completing the full nine day, four shrine circuit generates a minimum of 7 to 9 kilograms of waste, much of it plastic packaging, polythene and ritual material that is left along trekking routes and mountain streams in the absence of any dedicated collection system aligned with the Solid Waste Management Rules of 2016 (Hindustan Times, 2022). With more than 400,000 pilgrims visiting within the first twelve days of one recent season and over a million having registered for the full season, the cumulative waste burden on the state's high altitude ecosystems during the Yatra period plausibly exceeds, for a period of a few months each year, the waste management capacity the rest of this section's pollution control architecture was built to handle (Hindustan Times, 2022). As the state's tourism department prepares for both the 2026 Char Dham Yatra season and the upcoming Kumbh Mela in Haridwar, introducing measures such as pilgrim insurance alongside its established safety planning, the absence of an equally prominent, purpose built waste management mobilisation for the Yatra season specifically stands out as a gap between the state's tourism promotion capacity, discussed further in Chapter 19, and its environmental protection capacity as examined in this chapter (News on Air, 2026).

13.6 Coastal and Marine Resource Management, Where Applicable

This section is not applicable to Uttarakhand in the conventional sense the standardised format anticipates, since the state is entirely landlocked within the central Himalaya and possesses no coastline, territorial waters or marine ecosystem of any kind. Uttarakhand's closest structural analogue to coastal and marine resource management is instead the freshwater riverine and wetland governance discussed in section 13.3, since the state functions, in effect, as a headwater guardian for river systems whose eventual estuarine and coastal outcomes are determined thousands of kilometres downstream, in the Bay of Bengal delta systems fed by the Ganga that this framework's counterpart chapters for West Bengal and Bangladesh adjacent states would address directly. For consistency with the standardised document format applied across every state edition of this framework, this section is retained as a structural placeholder confirming non applicability, rather than omitted, so that readers comparing Uttarakhand's environmental governance chapter against a coastal state's equivalent chapter can confirm the absence of content reflects genuine geographic non applicability rather than an incomplete assessment. It is worth noting, in this same spirit of structural completeness, that Uttarakhand's absence of coastal exposure does not mean its natural resource governance is free of the cross border and cross jurisdictional coordination challenges coastal states face with neighbouring maritime jurisdictions, the state's own equivalent is the inter state river water sharing and joint hydropower development arrangements with Himachal Pradesh and Uttar Pradesh discussed in Chapters 9 and 21, a structurally similar coordination burden expressed through river basins rather than territorial waters.

Taken together, the six sections of this chapter describe a state whose environmental governance capacity, genuinely strong in wildlife conservation outcomes, increasingly tested in fire management, and actively engaged in mining enforcement following recent Supreme Court and National Board for Wildlife interventions, has not yet caught up with either the

accelerating pace of climate driven disaster risk documented in section 13.2 or the seasonal, pilgrimage driven pollution surge documented in section 13.5. Both of these unresolved pressures connect directly to this framework's Chapter 14 discussion of climate vulnerability and disaster risk reduction, and to Chapter 19's treatment of tourism as an economic driver, underscoring that Uttarakhand's environmental governance cannot be assessed, or reformed, as a self contained sector separate from the state's disaster preparedness and tourism promotion strategies examined elsewhere in this framework.

A small number of recurring patterns are worth drawing out explicitly for the state's own planning purposes. First, nearly every section of this chapter identified the same underlying gap, the absence of integrated, publicly published, district or watershed level monitoring data, whether for forest fire risk, landslide susceptibility, wetland water quality, riverbed mining volumes or ambient air and noise pollution along pilgrimage corridors, that would let the state's own Environment, Forest and Climate Change Department evaluate its interventions against outcomes rather than against activity counts alone, a pattern consistent with the data transparency gaps this framework's education and social justice chapters have already documented in other sectors. Second, court and central regulatory intervention, rather than the state's own proactive enforcement, has repeatedly been the decisive factor forcing compliance, visible in the Doon Valley litigation of the 1980s, the Nandhaur and Kosi river mining injunctions, and the 2025 and 2026 Eco Sensitive Zone rulings alike, suggesting that strengthening the state's own first line enforcement capacity, rather than relying on judicial correction after the fact, would represent a more resilient long term governance model. Third, and perhaps most importantly, the state's genuine conservation successes, its tiger and elephant population recovery chief among them, demonstrate that Uttarakhand's institutions are fully capable of sustained, effective environmental management when adequately resourced and monitored, which makes the persistence of weaker outcomes in fire management, mining enforcement and pilgrimage season pollution control a matter of institutional priority and resource allocation rather than of any inherent state incapacity, a distinction that should inform how this framework's Vision 2047 chapter, discussed in Chapter 21, sets its own environmental governance targets for the state's next planning cycle.

Chapter 14: Climate Change and Ecological Security

Climate change is not a future risk for Uttarakhand, it is a present operating condition that already shapes the state's schooling calendar, its hydropower economics, its pilgrimage tourism and its forest governance, each already examined from a different angle in Chapters 5, 9, 13 and 19 of this framework. A hill state where 86 percent of the land area is mountainous and where the Ganga and Yamuna both rise within its own borders experiences climate change less as a discrete environmental sector and more as a force multiplier running through every other chapter of this document, raising the stakes of decisions this framework has already examined about hydropower siting, road widening, forest fire response and pilgrimage season crowd management. This chapter draws those threads into a single, dedicated assessment across six dimensions, the state's underlying climate vulnerability and risk profile, the status of its formal climate action planning, its disaster hazard and exposure mapping, the institutional machinery built to reduce and respond to disaster risk, the framework governing relief and reconstruction after a disaster strikes, and finally the structural opportunities and constraints facing the state's transition toward a genuinely green economy.

14.1 State Climate Vulnerability and Risk Profile

Uttarakhand's mountainous geography makes it disproportionately exposed to global warming through a well documented phenomenon known as elevation dependent warming, in which higher altitude zones warm faster than the global average. The state is projected to warm by approximately 1.6 to 1.9 degrees Celsius by 2050, part of a broader Indian Himalayan Region trend expected to see temperature increases of 1.7 to 2.2 degrees Celsius by 2030 alongside precipitation increases of 60 to 206 millimetres, changes significant enough to disrupt cropping calendars, snowline elevation and perennial river flow across the region (Naithani et al., as cited in ScienceDirect, 2026; International Journal for Multidisciplinary Research, 2025). The Ministry of Earth Sciences has recorded a 1.3 degree Celsius temperature rise across the wider Hindu Kush Himalaya between 1951 and 2014, a warming trend that the Council on Energy, Environment and Water has linked directly to faster glacial retreat and more frequent flash flooding in Uttarakhand specifically, with the Council's own analysis finding that more than 85 percent of the state's districts, home to over nine million people, now qualify as hotspots for extreme flood events (Social Development for Communities Foundation, 2024).

Glacial retreat is the most visible and best studied dimension of this vulnerability. The Gangotri Glacier system, the primary source of the Ganga, has lost 10 percent of its snowmelt contribution to river flow between 1980 and 2020 according to a joint study by IIT Indore and the International Centre for Integrated Mountain Development, with Himalayan glaciers thinning at an average rate of 46 centimetres per year and the total area of glacial lakes across the Himalayan region expanding by 10.81 percent between 2011 and 2024 according to Central Water Commission data (Drishti IAS, 2025). The Chorabari Glacier near Kedarnath, whose glacial lake outburst flood contributed directly to the catastrophic 2013 disaster

examined in section 14.5, has itself shrunk from 6.1 square kilometres in 2009 to 5.91 square kilometres by 2019, retreating at roughly 7 metres per year (Climate Fact Checks, 2025). Most significantly for the state's forward looking risk assessment, a 2026 Indian Space Research Organisation study concluded that the August 2025 Dharali flash flood, examined in this framework's Chapter 13 land use discussion, was caused not by a cloudburst or a conventional glacial lake outburst flood but by the sudden collapse of an exposed ice patch in the nivation zone of the Srikanta Glacier, a previously under recognised category of cryo hydrological hazard directly linked to accelerating deglaciation (Vision IAS, 2026). This finding matters for state planning because it expands the catalogue of glacier related hazards the state's early warning systems, discussed in section 14.4, need to monitor beyond the two hazard types, cloudbursts and classic glacial lake outburst floods, that most existing disaster planning documents have historically treated as the primary Himalayan flood risks.

These physical changes translate into direct livelihood consequences for a state where a large share of the rural hill population still depends on rainfed terraced agriculture. Researchers studying the coupled effects of hydroclimatic variability and land use change in Uttarakhand report that farmers across the hill districts are already observing an upward shift in snowlines, increasingly erratic rainfall timing that disrupts traditional sowing and harvesting calendars, altered soil moisture content, and a documented rise in pest infestations that were previously less common at these altitudes, forcing a gradual and largely unplanned shift in which crops households choose to plant each season (International Journal for Multidisciplinary Research, 2025). Because this adaptation is happening at the level of individual households making year to year cropping decisions rather than through any coordinated state agricultural extension response, the state's climate vulnerability in practice looks less like a single, dramatic disaster risk and more like a slow, cumulative erosion of the predictability that terraced hill agriculture has depended on for generations, a distinction that should shape how the agricultural chapter of the state's own SAPCC revision, discussed in section 14.2, is written relative to its disaster management chapter, since the two require fundamentally different planning horizons and intervention types even though both stem from the same underlying warming trend.

14.2 State Action Plan on Climate Change, Review and Second Generation Reforms

Uttarakhand's formal climate planning architecture centres on its State Climate Change Centre, established on 8 June 2016 with support from the United Nations Development Programme to integrate the state's Action Plan on Climate Change with its Vulnerability and Risk Assessment, the Sustainable Development Goals and India's Intended Nationally Determined Contributions under the Paris Agreement (State Climate Change Cell Uttarakhand, n.d.). The original Uttarakhand Action Plan on Climate Change, prepared in accordance with the National Action Plan on Climate Change, explicitly frames itself as an evolving document requiring periodic revision as new vulnerability data becomes available, and the state's Forest Department confirmed that this second generation upgrade is now underway across twelve sectors, agriculture, forest and biodiversity, disaster management,

health, urban development, water resources, tourism, energy, roads, industries, transport, and animal husbandry and livestock, with a public comment process inviting scientists, researchers and civil society input into the revised document (Forest Department Uttarakhand, n.d.).

This state level revision sits within a national pattern of documented weaknesses in the first generation State Action Plans on Climate Change that Uttarakhand's own upgrade process appears designed to address directly, a top down drafting approach that limited local political ownership, targets and actions insufficiently specific to guide implementation, and a persistent assumption that adaptation financing would arrive from the central government or international climate finance rather than being budgeted domestically, weaknesses whose most commonly proposed remedy, the nomination of dedicated climate nodal officers within every key department, mirrors the cross departmental coordination structure the state's own upgraded plan is now attempting to build (Vision IAS, 2024). A parallel, sector specific plan, the State Action Plan on Climate Change and Human Health, has already been finalised by the Department of Health and Family Welfare and runs through 2027, targeting climate sensitive disease burden among children, women and marginalised populations and requiring district specific action plans to translate the state level document into local implementation (National Centre for Disease Control, 2024), a model of sector specific translation that the broader twelve sector SAPCC revision could usefully replicate for its energy, tourism and disaster management components discussed elsewhere in this chapter.

Uttarakhand's most distinctive recent contribution to climate policy, however, is not a plan but a measurement innovation. In June 2021 the state became the first in India to adopt the Gross Environment Product, an index conceived by Dehradun based ecologist Anil Prakash Joshi that assigns monetary value to the ecosystem services provided by air, water, soil and forest, explicitly complementing rather than replacing conventional Gross Domestic Product accounting (Wikipedia, Anil Prakash Joshi, n.d.). State analysis places the annual value of ecosystem services Uttarakhand provides to the nation through its biodiversity at approximately 95,112 crore rupees, and a comparative assessment of the index across 2020 to 2022 recorded a 0.9 percent increase in environmental products created over that period, with the underlying research finding measurable improvement in the index's air and water components and gains in the soil component linked specifically to the expansion of organic farming (ScienceDirect, 2024; PW Only IAS, 2024). Whether this genuinely innovative accounting tool feeds back into the SAPCC revision process described above, informing which sectors receive priority adaptation investment based on where ecosystem service value is rising or falling fastest, will be a meaningful test of whether Uttarakhand's climate governance institutions are learning from each other or operating as parallel, disconnected initiatives.

Financing remains the single largest unresolved question hanging over the entire second generation SAPCC process. The same national critique that identified over reliance on central and international climate finance as a structural weakness of first generation state plans applies with particular force to Uttarakhand, since the state's own forest carbon sequestration

value, a core input into the Forest GEP component discussed above, has not, on the evidence reviewed for this chapter, been formally monetised through any carbon credit or REDD Plus style mechanism that would let the state capture international climate finance in proportion to the standing forest carbon stock documented in Chapter 13, at 400.02 million cubic metres of growing stock, the second highest of any Indian state. A state that has pioneered ecosystem service accounting through its Gross Environment Product framework but has not yet connected that accounting to an actual carbon revenue stream is, in effect, measuring an asset it has not yet learned to monetise, a gap between valuation innovation and financing innovation that the second generation SAPCC revision would do well to treat as a priority rather than a secondary consideration.

14.3 Disaster Risk Profile, Hazard, Exposure and Vulnerability Mapping

Uttarakhand's own disaster management planning documents describe the state candidly as multi hazard prone, a classification driven by the same geography examined throughout this framework, 86 percent hilly terrain and 65 percent forest cover that together produce a favourite tourist destination and a major contributor to state output while simultaneously generating serious exposure to flash floods, landslides and earthquakes (Uttarakhand State Disaster Management Authority, 2025). Seismically, the entire state falls within Zones 4 and 5 of India's earthquake hazard classification, the two most severe categories on the national scale, a designation the state's Chief Secretary has cited directly when ordering earthquake preparedness mock drills across district headquarters in coordination with the National Disaster Management Authority (Uttarakhand State Disaster Management Authority, 2025). Layered onto this seismic exposure is the landslide susceptibility mapping examined in this framework's Chapter 13, which found 14,780 active landslide zones across the state, and the glacial lake and ice hazard exposure discussed in section 14.1, meaning any single location in the state's high Himalayan districts can simultaneously carry seismic, landslide and cryo hydrological hazard exposure that a single hazard risk map would understate.

The state's seismic classification is not a theoretical designation. The 20 October 1991 Uttarkashi earthquake, of moment magnitude 6.8, killed between 768 and 2,000 people depending on the estimate used and destroyed thousands of buildings, while the 29 March 1999 Chamoli earthquake, of moment magnitude 6.6, killed approximately 100 people in the same broader Garhwal Himalaya region eight years later (Wikipedia, 1991 Uttarkashi earthquake, n.d.; Grokipedia, 1999 Chamoli earthquake, n.d.). Seismologists studying the region have identified both events as occurring within the central seismic gap, a roughly 700 kilometre segment of the Himalayan arc lying between the great 1905 Kangra earthquake, of magnitude 8.6, and the great 1934 Bihar earthquake, of magnitude 8.4, that has not itself released a comparably large rupture in the historical or instrumental record, a pattern that leads researchers to treat the segment, which runs directly through Uttarakhand, as overdue for a high magnitude event by the standards of regional seismic hazard modelling (Rajendran et al., as cited in ResearchGate, 2025). That the same districts exposed to this overdue earthquake risk are also the districts already carrying the highest landslide and glacial hazard exposure documented elsewhere in this chapter means Uttarakhand's disaster risk profile is

not simply multi hazard in the sense of facing several independent risks, it is compound hazard in the more serious sense that a major seismic event could plausibly trigger secondary landslides and glacial lake failures across the same terrain already destabilised by the climate driven processes described in section 14.1, a scenario the state's exposure and vulnerability mapping should model explicitly rather than treating earthquake, landslide and glacial hazard risk as separate layers to be assessed independently.

The Union Government's response to this compounding glacial hazard has been to treat it as a distinct national priority, launching the National Glacial Lake Outburst Flood Risk Mitigation Project in 2025 for the Himalayan states most exposed to this risk, explicitly including Uttarakhand alongside Arunachal Pradesh, Sikkim and Himachal Pradesh as the country's principal glacial lake zones (KP IAS Academy, 2026). This national project sits alongside, rather than replacing, the state's own dam specific early warning infrastructure, since the Tehri Hydro Development Corporation and the Uttarakhand State Disaster Management Authority have jointly developed and funded a flood early warning dissemination system for communities downstream of the Tehri Dam, a site specific mitigation measure that reflects the same layered, site by site approach to a genuinely state wide multi hazard exposure profile that section 14.1's discussion of the Dharali ice patch collapse finding suggests may need to broaden further still, since a hazard mapping exercise built primarily around cloudburst and classic glacial lake outburst flood scenarios would not have anticipated an ice patch collapse as the triggering mechanism for a major flash flood.

14.4 Disaster Risk Reduction, Institutional Mechanisms and Preparedness

The Uttarakhand State Disaster Management Authority, established under Section 14 of the national Disaster Management Act, 2005, functions as the state's nodal agency for disaster policy, planning approval and preparedness coordination, working alongside a dedicated State Disaster Response Force formed in 2014 that has since become the first state police unit in India to complete a Mount Everest summit expedition, an eight member team hoisting the Indian flag after a 55 day climb that included ascents of Lobuche East Peak and Kala Patthar, an achievement the force has used to demonstrate the high altitude operational capability its search and rescue mandate requires (Devex, n.d.; Wikipedia, State Disaster Response Force Uttarakhand, n.d.). This capability was itself built through a structured national training partnership, personnel deputed to the state force received specialised instruction from the National Disaster Response Force in Medical First Response, Collapsed Structure Search and Rescue, rope rescue, flood rescue and Chemical, Biological, Radiological and Nuclear response, alongside dog squad training for locating survivors in earthquake damaged buildings, conducting 17 operational deployments across the state's districts in its first year alone (Wikipedia, State Disaster Response Force Uttarakhand, n.d.).

The Authority's State Emergency Operation Centre has measurably improved its own responsiveness, reducing average emergency response time under the national ERSS-112 helpline from 21 minutes to 11 minutes according to an April 2025 review by the state's Chief Secretary, who used the same review to direct that an earthquake early warning system jointly

developed by the Authority and the Indian Institute of Technology Roorkee be strengthened through additional sensors and sirens (Uttarakhand State Disaster Management Authority, 2025).

Preparedness activity has continued on a rolling, seasonal basis rather than as a one time institutional exercise. In 2025 and early 2026 alone, the Authority organised a dedicated cold wave preparedness workshop in January 2026, reviewed monsoon preparedness with the Chief Minister in June 2025 following a red alert for heavy rainfall in the Kumaon region, and ordered mock drills in flood prone areas, alongside the establishment of the U-Prepare Project and the Uttarakhand Landslide Mitigation and Management Centre as newer, more specialised institutional additions to the state's disaster architecture (Uttarakhand State Disaster Management Authority, 2026; Deccan Herald, 2025). This seasonal rhythm, cold wave preparedness in January, monsoon and flood preparedness from June, and Yatra season readiness reviews timed to the Char Dham calendar discussed in Chapter 13, gives the state's disaster machinery a genuinely proactive cadence that many state disaster authorities in India have struggled to sustain outside the immediate aftermath of a major event, and reflects lessons that appear to have been institutionalised rather than merely announced following the 2013 and 2021 disasters examined elsewhere in this chapter. District Disaster Control Rooms now operate with published contact numbers across all thirteen districts, including dedicated lines for the Kedarnath and Badrinath pilgrimage corridors that see the heaviest seasonal footfall discussed in Chapter 13's treatment of Yatra season pollution (India.gov.in, n.d.). Even so, a June 2025 helicopter accident near Rudraprayag, which prompted the Chief Minister to order a formal inquiry, underscores that institutional preparedness gains measured in emergency call response times have not yet fully extended to the aviation dependent rescue and pilgrimage transport operations that the state's high altitude terrain increasingly relies upon during peak Yatra season (Uttarakhand State Disaster Management Authority, 2025).

14.5 Post Disaster Response, Relief and Reconstruction Framework

The catastrophic flash floods and glacial lake outburst flood that struck Uttarakhand on 16 and 17 June 2013, most severely affecting Bageshwar, Chamoli, Pithoragarh, Rudraprayag and Uttarkashi districts, remain the defining test case for the state's relief and reconstruction framework. Independent humanitarian accounts recorded the disaster as affecting over two million people across an area comparable in size to Iceland, with an officially reported death toll in the thousands and many more people never accounted for in the months that followed (UNA-UK, 2014). The disaster response drew sustained criticism at the time, contemporary reporting highlighted that 248 roads and 272 villages remained cut off from relief operations even as government attention turned toward reconstructing the Kedarnath temple itself, which had survived the flood largely intact, a sequencing choice critics characterised as prioritising a symbolically important but structurally undamaged religious site over continued rescue and relief access to isolated communities (Maps of India, 2015).

The financial architecture underpinning both the immediate 2013 response and every subsequent relief operation discussed in this section runs through the State Disaster Response

Fund, the state level counterpart to the National Disaster Response Fund established under the Disaster Management Act, 2005, which provides the primary standing financial mechanism for immediate relief expenditure, distinct from the longer term reconstruction financing described below and released against norms set jointly by the Union Finance Ministry and successive Finance Commissions rather than negotiated afresh after each individual disaster (Uttarakhand State Disaster Management Authority, 2025). This standing fund model, whatever its limitations in the scale of a disaster as severe as 2013, gives the state a materially faster initial financial response than would be available if relief funding had to be separately appropriated after each event, and its existence should be read alongside the ERSS-112 response time improvements documented in section 14.4 as part of the same broader shift from ad hoc, post disaster financial mobilisation toward standing, pre positioned disaster finance and response infrastructure.

Longer term reconstruction was anchored in the World Bank supported Uttarakhand Disaster Recovery Project, whose Owner Driven Construction and Habitat scheme provided earthquake resistant housing to 2,410 victim families across the five worst affected districts, based on a Joint Rapid Damage and Needs Assessment conducted by the World Bank, the Asian Development Bank and the state government (Serials Journals, 2018). Private sector and civil society reconstruction ran in parallel, a Tata Group sustainability programme active in Rudraprayag, Uttarkashi and Pithoragarh reached 96 villages with livelihood, water and sanitation, and early childhood education initiatives, covering 5,935 households through agriculture, livestock and non farm livelihood interventions, training 1,414 youth through Tata STRIVE skill development centres, and supporting 41 government schools that benefited more than 3,800 students, with 2,010 participating families reporting a combined annual income of 1.48 crore rupees from the livelihood programme by 2019 (Tata Sustainability Group, n.d.). That a single corporate rehabilitation programme could document outcomes at this level of granularity six years after the disaster, while this chapter has repeatedly found state agencies unable to produce comparably disaggregated figures for other sectors, again illustrates the data transparency gap this framework has traced across its education, social justice and environmental governance chapters alike.

The framework's institutional memory has, at least partially, translated into faster routine response for smaller scale, recurring disruptions. In August 2024, when heavy rainfall again damaged pedestrian halts along the Kedarnath footpath, the Chief Minister directed immediate repair work and prioritised pilgrim safety within days rather than months, a response tempo markedly faster than the 2013 experience, though this comparison also underscores that the state's reconstruction capacity has been tested far more often by moderate, localised disruptions to its pilgrimage infrastructure than by another disaster of 2013's scale, leaving open the question of whether current institutional capacity would in fact scale adequately if a comparably severe event recurred (News on Air, 2024).

14.6 Green Economy Transition, Opportunities and Structural Challenges

Uttarakhand's most visible recent green economy initiative is its push toward electric mobility, though the state's own data show this transition is still at an early stage. As of July 2025, the state had only 86,614 electric vehicles among a total registered fleet of 42 lakh vehicles, a penetration rate of roughly 2 percent, according to the state's Transport Secretary (AckoDrive, 2025). A comprehensive Electric Vehicle Policy has been under active development since at least mid 2025, with successive drafts through 2026 proposing purchase subsidies varying by vehicle type and battery capacity, incentives targeted specifically at women buyers, full tax exemption on electric vehicle purchases, and a mandate that at least 50 percent of new vehicles procured by state government departments be electric, alongside continued investment in charging infrastructure and manufacturing incentives intended to attract EV component production to the state (Indian Masterminds, 2026; Indian PSU, 2026). That this policy remained in draft form across multiple review cycles from mid 2025 into mid 2026, even as neighbouring Maharashtra finalised a more comprehensive electric mobility plan targeting 30 percent penetration in May 2025, suggests the state's political commitment to electric mobility has, to date, outpaced its regulatory delivery, a gap the state's own tourism dependent, hill terrain vehicle fleet, discussed in Chapter 8, gives it a particular incentive to close given the air quality and noise pollution pressures documented in Chapter 13.

Renewable energy expansion, examined in detail in this framework's Chapter 9, forms the other principal plank of the state's green economy strategy, with Chief Minister Pushkar Singh Dhami reiterating a target of 2,500 megawatts of installed solar capacity by 2027 alongside continued hydropower expansion, though as Chapter 9 documented in detail, the state's flagship hydropower pipeline already runs years behind its own 2025 and 2030 capacity targets, a track record that should inform how much confidence planners place in the newer solar timeline.

Beyond electricity and mobility, the state's forest sector represents a third, less widely publicised green economy channel, one that already employs substantial rural labour through plantation, afforestation and forest fire response work but has not, on the evidence reviewed for this chapter, been formally reframed or expanded as a deliberate green jobs programme in the way EV manufacturing and solar installation have been. Given that forest fire incidence, documented extensively in Chapter 13, has been rising sharply even as the state's own Gross Environment Product accounting shows genuine gains in its Forest component linked to afforestation, there is a clear opportunity to expand seasonal, forest fire prevention and rapid response employment as a formally recognised category of green job, one that would simultaneously address the fire management gap identified in Chapter 13 and provide the kind of local, hill district employment that could reduce the out migration pressure documented throughout this framework's education, energy and social justice chapters, rather than treating fire response purely as an emergency cost the Forest Department absorbs each dry season.

The state's Gross Environment Product framework, described in section 14.2, offers a genuinely distinctive structural advantage for evaluating this green transition, since a state

that already measures and monetises air, water, soil and forest ecosystem services in parallel with conventional economic output is better positioned than most to assess whether its EV, solar and hydropower investments are net additive to ecological value or merely additive to installed capacity figures. Realising that advantage in practice, however, depends on connecting the Gross Environment Product accounting exercise to the sector specific SAPCC revision, the EV policy finalisation and the state's broader energy planning in a single decision making process, rather than allowing all three to continue developing along the largely separate institutional tracks this chapter has documented, the structural challenge that will most determine whether Uttarakhand's green economy transition compounds into the kind of integrated ecological security this chapter's title anticipates, or remains a collection of genuinely promising but loosely connected initiatives.

Drawing the chapter's six sections together, Uttarakhand's climate and ecological security position in 2026 combines a genuinely sophisticated scientific and institutional base, from IIT Roorkee's earthquake early warning collaboration to the Gross Environment Product's pioneering ecosystem accounting, with three unresolved structural weaknesses that recur across nearly every section. First, the state's hazard assessment still tends to treat earthquake, landslide, glacial and climate risk as separate technical domains rather than as the compounding, mutually reinforcing hazard system sections 14.1 and 14.3 have shown them to be. Second, financing for adaptation and green transition, whether for the SAPCC revision, forest carbon value, or green jobs in fire prevention, remains largely unconnected to the state's own genuinely innovative measurement tools, meaning Uttarakhand has repeatedly built the instruments to know what its ecological assets are worth without yet building the financial mechanisms to capture and reinvest that value. Third, institutional memory from the 2013 disaster has clearly improved routine, smaller scale disaster response, visible in faster Kedarnath footpath repairs and reduced emergency call times, but the state's capacity to manage a disaster of genuinely comparable scale to 2013 has not been tested since, leaving a meaningful gap between demonstrated competence at moderate disruption and unverified capacity at catastrophic scale. Closing these three gaps, integrated hazard modelling, adaptation finance connected to ecosystem valuation, and disaster response capacity tested and verified at the highest severity levels the state's own risk profile anticipates, should be the organising priority for the second generation SAPCC process discussed in section 14.2 as it moves from public consultation toward final adoption.

Chapter 15: Administrative Governance Reform

Uttarakhand's administrative machinery carries a structural burden common to India's newer, smaller states: a full complement of departments, regulatory bodies and enforcement institutions sized for a state of its population, but stretched across a terrain, and a set of strategic responsibilities, border security with two countries, pilgrimage-season crowd management, disaster response, that a plains state of comparable population would not face. This chapter examines the structure of state administration and inter-departmental coordination, the anti-corruption framework built around the Lokayukta and Vigilance Establishment, judicial pendency and access to justice, police modernisation and internal security, regulatory governance quality, the reduction of red-tapism through digital simplification, and the strength and training of the civil service that must deliver on all of the above.

15.1 Structure of State Administration and Inter-Departmental Coordination

The Secretariat functions through various departments divided into sections (Anubhag), each consisting of one Section Officer, Review Officer, Assistant Review Officer, Computer Operator and Sachivalaya Sahayak, with the Chief Secretary overseeing the entire functioning of the Secretariat organization and supervising Additional Chief Secretaries, Principal Secretaries and Secretaries (Secretariat Administration Department, Uttarakhand, n.d.). Currently 159 sections have been created under a total of 59 departments of the Secretariat Administration Department (Secretariat Administration Department, Uttarakhand, n.d.). Anand Bardhan has been the incumbent Chief Secretary since 1 April 2025, with the post having been formed on 9 November 2000 and Ajay Vikram Singh as its inaugural holder (Wikipedia, n.d.), a succession pattern of roughly fourteen holders in twenty-five years that itself says something about the continuity challenges facing the state's top administrative leadership. Uttarakhand has 42 state government departments grouped under ministerial portfolios headed by members of the Council of Ministers (Wikipedia, n.d.), spanning line departments from Finance and Home to smaller, more specialised bodies such as the Accountant General's office and Chief Development Office.

Inter-departmental coordination in a state of Uttarakhand's geographic complexity depends heavily on mechanisms that sit outside the formal departmental hierarchy. The Chief Secretary acts as ex-officio Secretary to the Uttarakhand Council of Ministers, providing secretarial assistance to the cabinet, ensuring implementation of decisions, acting as the policy coordination centre, and organising conferences (Wikipedia, n.d.), but much of the coordination this framework has documented in other chapters, the Directorate of Industries working with SIIDCUL and the Single Window Portal in Chapter 4, the Health Department coordinating with the Women and Child Development Department on nutrition in Chapter 6, the multiple agencies involved in Namami Gange sewerage investment in Chapter 10, happens through project-specific committees and memoranda of understanding rather than through a single, standing inter-departmental coordination architecture. This project-by-project coordination model has delivered real results where a single lead agency has clear ownership, the Mega Industrial and Investment Policy's Common Application Form being one example, but this framework has also documented, in Chapters 4 and 11, instances

where overlapping mandates, between the Directorate of Industries and SIIDCUL, or between development authorities and elected urban local bodies, have left accountability diffused across more than one institution.

A newer addition to this administrative architecture illustrates both the state's institutional creativity and its tendency toward proliferation: the Uttarakhand State Authority for Minority Education, a statutory body formed in 2026 under the Uttarakhand Minority Educational Institutions Act, 2025, regulates and recognises minority educational institutions in the state and replaced the Uttarakhand Madrasa Education Board (Wikipedia, n.d.). Each such creation adds a further node to the coordination map this section has described, and while individually justified, their cumulative effect is a state administrative structure that has grown more complex, not less, over the past decade, a trend at some tension with the simplification agenda examined in section 15.6.

A Biometric Attendance System is being used to ensure the mandatory attendance of officers and staff of the secretariat within stipulated office working hours, and the Secretariat Administration Department administers the secretariat service cadre, private secretary cadre, accounts cadre and security cadre (Secretariat Administration Department, Uttarakhand, n.d.). This centralisation offers consistency in service conditions and career progression across the Secretariat's many departments, but it also means that staffing decisions for any one department's Anubhag can depend on a personnel process controlled outside that department, adding another layer to the coordination challenge already described. District-level administration, meanwhile, operates through a more traditional revenue and magisterial hierarchy of District Magistrates, Additional District Magistrates and Sub-Divisional Magistrates, whose coordination with line departments on the ground, health, education, industries, disaster response, depends heavily on the individual District Magistrate's own convening authority and working relationships rather than on any statutory district-level coordination body with powers comparable to the Secretariat's own inter-departmental machinery, a gap that becomes particularly consequential during the seasonal, multi-agency demands of the Char Dham Yatra documented across Chapters 6, 10 and 14 of this framework.

15.2 Anti-Corruption Framework: Lokayukta, Vigilance and Enforcement

Uttarakhand's anti-corruption architecture rests on two distinct institutions that have followed sharply different trajectories. The Vigilance Establishment, the state's operational anti-corruption enforcement body handling trap cases, disproportionate-assets investigations and departmental corruption complaints, remains active and reports regularly on its casework: in 2025, the Vigilance Establishment disposed of a total of 28 cases, comprising 5 open enquiries, 2 investigations and 21 trap cases, and through intelligence gathering in 20 cases, reports were sent to the government for initiating open enquiries and registering cases regarding disproportionate assets; due to effective prosecution, convictions were secured in 3 out of 6 corruption cases brought before the court (Garhwal Post, 2026). The toll-free number 1064 and the official website received a total of 2,209 complaints in 2025, of which 470

pertained to vigilance matters, while 1,739 were non-vigilance in nature (Garhwal Post, 2026), an indicator that the anti-corruption helpline has become a more general public-grievance channel in practice than its formal mandate alone would suggest.

The Uttarakhand Lokayukta, the state's ombudsman institution empowered under the Uttarakhand Lokayukta Act, 2014 to investigate allegations of corruption, abuse of authority, nepotism and maladministration by public functionaries including the Chief Minister, cabinet ministers, legislators and senior bureaucrats, presents a starkly different picture. Despite its mandate to enhance governance accountability, the office has remained vacant since the retirement of its previous incumbent (Grokopedia, 2026). It was only following a Selection Committee meeting on 4 June 2026, held under the Uttarakhand Lokayukta Act, 2014, that the government constituted a Search Committee tasked with preparing a panel of suitable candidates for the Chairperson and Members (Business Upturn, 2026). The Search Committee comprises five members drawn from the judiciary, civil services and academia, chaired by a former Judge of the High Court of Nainital and including two retired Chief Secretaries of Uttarakhand among its members (Samveg IAS, 2026). Whatever the eventual outcome of this search process, the extended vacancy itself represents a significant governance gap: for a period spanning multiple years, the specific institution designed to investigate the state's most senior public functionaries independently of the executive vigilance machinery that reports, ultimately, to the same government it investigates, has simply not existed in practice, leaving the more routine, departmentally-focused Vigilance Establishment as the state's only consistently functioning anti-corruption enforcement body during that interval.

This pattern, an operationally active but institutionally narrower vigilance apparatus alongside a dormant or vacant higher ombudsman office, is not unique to Uttarakhand among Indian states; Gujarat's Lokayukta post lay vacant for roughly two decades after 2003 for related reasons, and delays in Lokayukta and Lokpal appointments have been a recurring feature of India's anti-corruption institutional landscape at both state and central level. What is specific to Uttarakhand's case is the timing: the 2026 Search Committee's formation coincides with this framework's broader documentation, across Chapters 4 and 11, of significant public scrutiny of the state's investment-promotion claims and public sector enterprise accounting, precisely the kind of higher-level scrutiny an operational Lokayukta, rather than the Vigilance Establishment's trap-case and disproportionate-assets caseload alone, would be positioned to examine.

The legal architecture underpinning both institutions merits brief note for what it reveals about jurisdictional design. Offences under the Prevention of Corruption Act are cognizable offences, meaning registration of an FIR is mandatory before commencement of investigation, though the Vigilance Establishment's stated practice is to register the FIR only after laying a trap, a procedural approach the Uttarakhand High Court has noted differs from that adopted by the CBI (Indian Kanoon, 2025). This structural choice, prosecuting corruption cases through dedicated Special Judge courts under the Uttarakhand Special Courts Act rather than the ordinary sessions hierarchy, is intended to speed corruption case

disposal by avoiding competition with the general criminal docket already straining under the caseload composition documented in section 15.3. Whether this dedicated court structure has in practice achieved materially faster disposal than routing the same cases through ordinary sessions courts is a comparison this chapter's sources did not permit, though the conviction rate of three out of six prosecuted cases in 2025 offers at least a preliminary data point on the pipeline's effectiveness once a case reaches trial, as distinct from the separate and much larger question of how many suspected corruption cases never reach that stage at all.

Looking ahead, three concrete steps would strengthen this framework's anti-corruption architecture beyond simply filling the Lokayukta vacancy. First, publishing the Vigilance Establishment's caseload data on a standard annual schedule, rather than through periodic press briefings of the kind this chapter has relied on, would let citizens and researchers track trends over time rather than relying on point-in-time snapshots. Second, clarifying the jurisdictional boundary between Vigilance Establishment and Lokayukta once the latter is reconstituted, so that complaints are not lost in referral between the two bodies, would address a coordination risk inherent in having two parallel anti-corruption institutions. Third, extending the same complaint-volume transparency the 1064 helpline already provides to the eventual Lokayukta's own caseload would allow this framework's future editions to assess whether the reconstituted institution is functioning at a scale commensurate with the seriousness of the mandate it holds on paper.

15.3 Legal and Judicial Administration: Pendency, Access and Reform

Uttarakhand's judicial caseload has a distinctive composition relative to most other Indian states: the caseload of Uttarakhand is dominated by criminal cases, constituting 84.7 percent of the total, the highest in the country, whereas in Tamil Nadu, Andhra Pradesh, Goa, Manipur and Himachal Pradesh, civil cases constitute more than 50 percent of the courts' workload (Daksh India, n.d.). This composition has direct implications for how judicial reform priorities should be weighted in the state: measures aimed at civil case management, commercial courts, mediation centres, are likely to address a smaller share of the state's actual pendency problem than measures aimed at criminal case throughput, bail hearing capacity and prosecution-side case preparation.

On raw pendency trends, Uttarakhand's High Court has performed notably worse than most state High Courts over the past decade: among the High Courts of Indian states, Rajasthan, Himachal Pradesh and Uttarakhand saw considerable increases in pendency over the period, Rajasthan by 200 percent and the latter two by over 150 percent, while a few High Courts, including Tripura, Jammu and Kashmir and Ladakh, and Calcutta, brought down their pendency (Data For India, 2026). As of an April 2024 count, Uttarakhand, with a total sanctioned strength of 11 judges, had four vacancies (Supreme Court Observer, 2024). In early 2025, overall vacancy in the High Courts nationally was found to be 33 percent and in subordinate courts 21 percent (Data For India, 2026), while as of 1 July 2026, total sanctioned strength across all High Courts stood at 1,122 judges against a working strength of only 781, an overall vacancy rate of 30.39 percent, and district courts nationally showed

23,558 working against a sanctioned strength of 30,868, a vacancy rate of 23.68 percent (The Print, 2026). A Uttarakhand-specific subordinate court vacancy percentage current to 2025 or 2026 could not be independently verified from the sources consulted for this chapter, though the High Court's own recruitment cell notified 16 judicial vacancies for various cadres in April 2025 (Toprankers, 2025), and a further 8 vacancies for Civil Judge (Junior Division) direct recruitment were notified in May 2025 (PW, 2025).

One notable positive finding tempers this otherwise concerning pendency picture: Uttarakhand and Puducherry each have only one case pending for over 30 years, far below the counts reported in several larger states (IASGyan, 2022), suggesting that whatever pressure is driving the state's rising pendency trend, it has not yet produced the kind of multi-decade case backlog seen elsewhere. Addressing the state's judiciary vacancy rate directly, alongside continued expansion of e-Courts infrastructure and family court counsellor positions the High Court has recruited for across districts including Almora, Bageshwar, Chamoli, Champawat, Pithoragarh, Rudraprayag, Tehri Garhwal and Udham Singh Nagar (High Court of Uttarakhand, 2024), represents the most direct lever available to reverse the pendency growth trend documented above before it produces the kind of entrenched, decades-old backlog other states now struggle to clear.

Access to justice in Uttarakhand carries a distinctly geographic dimension that the pendency statistics alone do not capture. The High Court itself sits in Nainital, a considerable journey from the state's more remote hill districts, meaning that litigants pursuing an appeal or a writ petition from Uttarkashi, Pithoragarh or Chamoli face travel costs and time burdens well beyond what the same proceeding would require of a Dehradun or Haridwar resident, a variant of the same terrain-driven access cost this framework has documented for health services in Chapter 6.1 and for administrative service delivery more generally. District and subordinate courts, being more numerous and closer to where disputes actually arise, therefore carry a disproportionate share of the access-to-justice burden in the hill districts specifically, which makes the subordinate judiciary vacancy question, even though this chapter could not confirm a current disaggregated figure for it, arguably more consequential for ordinary litigants' practical access to justice than the more closely watched High Court vacancy rate.

15.4 Police Modernisation and Internal Security Management

Uttarakhand Police, formed on 9 November 2000, operates with an annual budget of roughly Rs 2,856 crore for 2025-26, headed by Director General of Police Deepam Seth under the Department of Home Affairs (Wikipedia, n.d.), and carries an internal security mandate shaped decisively by the state's position as one of India's few states bordering two countries. Superintendents of Police from the state's five border districts, Udham Singh Nagar, Pithoragarh, Champawat, Uttarkashi and Chamoli, which share international borders with Nepal and Tibet (China), attended the Land Border Districts' Superintendents of Police Conference 2026 in New Delhi, where DGP Seth, alongside Home Secretary Shailesh Bagauli and Director General (Intelligence and Security) Abhinav Kumar, presented

suggestions on technology-driven border surveillance, prevention of cross-border crimes, strengthening local intelligence networks, and development of infrastructure in border areas (Uttarakhand Police, ANI/Newkerala, 2026), reflecting a modernisation agenda oriented as much toward frontier security coordination with central agencies as toward conventional urban policing.

The State Disaster Response Force, integral to the police structure, maintains 19 forward bases along pilgrimage corridors like the Char Dham routes, each staffed by 13 to 17 trained responders equipped for high-altitude extractions, flood evacuations, and medical aid in disaster zones (Grokikipedia, 2026), a force structure that complements the ambulance and helicopter evacuation network discussed in Chapter 6.2 and 10.4's e-Swasthya Dham initiative rather than duplicating it. The Government Railway Police secures railway stations and trains in key junctions such as Haridwar, addressing thefts, sabotage attempts and passenger safety, while the Crime Investigation Department handles specialised inquiries into economic offenses and inter-district crimes (Grokikipedia, 2026) requiring forensic and cross-jurisdictional coordination beyond routine district policing capacity.

Digital modernisation has proceeded through the national Crime and Criminal Tracking Network and Systems (CCTNS) project, under which Uttarakhand Police offers cyber crime complaint registration as a citizen service through the national government services portal (National Government Services Portal, n.d.), complementing the state's broader e-governance push documented in section 15.6. A police modernisation plan reportedly worth approximately Rs 393 crore has been proposed for the force (Grokikipedia, 2026), though its specific components, timeline and current approval status could not be independently confirmed from the sources available for this chapter. High-profile criminal cases have also shaped police accountability debates in the state, including continued legal proceedings connected to a 2022 case on which fresh FIRs were filed in December 2025 (Wikipedia, n.d.), illustrating how individual cases can drive broader regulatory reform in hospitality-sector staff verification and safety practice beyond the criminal justice process itself, a dynamic this framework returns to in Chapter 7's discussion of women's safety more broadly.

Community-facing policing initiatives, distinct from the border-security and disaster-response functions already described, form a third strand of the state's modernisation effort, though Uttarakhand-specific programme detail proved harder to source independently than for the neighbouring Uttar Pradesh's more heavily publicised Mission Shakti initiative, which operates on a comparable national funding architecture through the Ministry of Women and Child Development's umbrella Mission Shakti scheme covering all states during the Fifteenth Finance Commission period. Uttarakhand Police's own women's safety infrastructure, women help desks at police stations, women beat officers, and the toll-free women's helpline that operates as part of the same national architecture described in Chapter 6.5 for mental health tele-counselling, appears to draw on this same central scheme framework, but a state-specific accounting of desk coverage, staffing, or utilisation comparable to the granular figures available for Uttar Pradesh's programme could not be confirmed from the sources consulted

here, an evidentiary gap this framework flags for direct follow-up against the state Home Department's own annual policing report.

Recruitment and cadre strength within the police force itself follows the same broader civil service staffing pattern examined in section 15.7: constable and sub-inspector recruitment drives run on the state's own periodic examination cycle, but a police-specific vacancy rate, as distinct from the IAS and judicial vacancy figures this chapter documents elsewhere, was not available from the sources consulted for this chapter, a further data gap worth closing given how directly frontline police staffing bears on the border security, disaster response and community policing functions all described above.

15.5 Regulatory Governance: Quality, Consistency and Independence

Regulatory governance in Uttarakhand is most visible, and most externally validated, in the investment and industrial clearance domain already examined in Chapter 4.1: the state's Business Reform Action Plan "Achievers" category placement and its Single Window System. The Uttarakhand government launched the online Single Window System in March 2016 to simplify and accelerate investment approvals, and was one of the pioneer states to integrate its system with the National Single Window System; at the National Investors' Summit in Delhi, the state won the 'Top Achievers' award under the Ease of Doing Business category, recognising timely approvals, inter-departmental collaboration, online grievance mechanisms and a dedicated investor helpline (Exploring Wings, 2025).

Beyond the industrial clearance domain, however, the state's regulatory quality is considerably more unevenly documented. The Uttarakhand Pollution Control Board's own accreditation gap, detailed in Chapter 10.5, where allocated funds for securing National Accreditation Board for Testing and Calibration Laboratories certification went substantially unspent and no laboratory sought accreditation over a five-year period, illustrates that regulatory capacity built for one function, environmental monitoring in that instance, can lag well behind the state's more visible investment-facilitation regulatory apparatus. Similarly, the Urban Local Body financial and staffing autonomy constraints documented in Chapter 11.2, where the State Government retains authority to direct municipal tax rates and, until 2019, constrained municipal corporations' own spending authority, reflect a regulatory relationship between state and local government that is considerably less consistent, and less oriented toward local regulatory independence, than the investor-facing single window system's reputation for efficiency would suggest characterises the state's regulatory culture as a whole.

This unevenness suggests that Uttarakhand's regulatory governance is best understood not as uniformly strong or weak but as a function of which sector's political and economic priority has translated into sustained institutional investment: sectors central to the state's investment-promotion narrative have received consistent regulatory streamlining attention, while sectors whose consequences are more diffuse or longer-term, environmental monitoring credibility, municipal fiscal autonomy, statutory corporation account finalisation as

documented in Chapter 11.2's CAG findings, have not received comparable sustained attention despite carrying their own significant public interest.

Regulatory independence, as distinct from regulatory efficiency, raises a further question this chapter's evidence only partially answers. Bodies such as the Uttarakhand Pollution Control Board and the Uttarakhand Electricity Regulatory Commission are formally independent statutory authorities, but their staffing, budgets and, in the pollution board's case, laboratory accreditation priorities are ultimately set through state government budgetary and appointment processes rather than through arrangements that would insulate them from the same executive whose industrial and infrastructure decisions they are meant to regulate. This is not a criticism unique to Uttarakhand; most Indian state regulatory bodies operate under comparable executive-dependent structures. But it does mean that the investment-facilitation regulatory success documented at the start of this section and the environmental and municipal regulatory gaps documented immediately after it are, in an important sense, two expressions of the same underlying institutional reality, a state administration whose regulatory attention follows its political priorities rather than operating on a uniformly independent basis across sectors, a pattern this chapter's remaining sections on red-tapism and civil service capacity return to from different angles.

15.6 Reduction of Red-tapism: Simplification and way forward

Uttarakhand's e-Governance milestone, the Online RTI Portal, was inaugurated by Chief Minister Pushkar Singh Dhami on 15 January 2024, along with an Online Second Appeal, Complaint and Hybrid Hearing System, and an Interoperable Criminal Justice System integrating databases of law enforcement and judicial agencies for seamless data sharing (National Informatics Centre, 2025). NIC Uttarakhand's broader digital portfolio, spanning School Education, StarBus tracking, the State Tax Department, the CM Grievance System, eCabinet and Treasury Computerisation, has collectively earned the unit around 40 prestigious awards, including Digital India Awards, CSI, WebRatna and SKOCH recognitions (National Informatics Centre, 2025), a track record suggesting the state's back-end digital infrastructure capacity is genuinely more developed than the uneven regulatory quality picture in section 15.5 might otherwise suggest.

At the urban development authority level, UHUDA's eASE App, implemented in 2020, brought all urban development authorities under a single integrated digital platform, introducing automation in building plan approvals, grievance redressal, RTI management, HR systems and project monitoring, with auto-scrutiny, auto-escalation and deemed-approval features drastically reducing delays, backed by 12 functional modules, 24x7 helpdesk support and real-time MIS dashboards (Inclusion, 2025). Independent governance rankings have taken note of this effort, with Uttarakhand placed third best state nationally in the 2025 SKOCH State of Governance ranking, behind only Maharashtra among the states cited (Inclusion, 2025), a result that, if borne out by more granular sector-specific evidence, would represent a meaningfully different governance story from the sector-specific gaps, the

Lokayukta vacancy, the judiciary pendency growth, the municipal fiscal autonomy constraints, this chapter has documented elsewhere.

Reconciling these two pictures, a strong and improving digital service-delivery layer against persistent institutional gaps in oversight and enforcement capacity, is itself the central red-tapism challenge facing the state going forward. Digitising an application process removes the delay caused by physical file movement and discretionary sign-off, a genuine and measurable gain for the citizen or business filing a routine application; it does less to address delay or gaps caused by an unfilled Lokayukta post, a High Court running four judges short of sanctioned strength, or a pollution control board that has not pursued its own laboratory accreditation, none of which digital front-end simplification alone can resolve. The state's next phase of red-tapism reduction would benefit from applying the same auto-escalation and deemed-approval discipline the eASE App has brought to building-plan approvals to the institutional appointment and vacancy-filling processes this chapter has documented as lagging, treating an unfilled ombudsman post or an unfilled judicial vacancy as a service-delivery failure warranting the same dashboard visibility and escalation triggers as a delayed building permit.

A further, more subtle risk in the state's digitisation-led simplification strategy is worth naming directly. Award recognition of the kind NIC Uttarakhand and the eASE App have received measures the existence and functionality of a digital system, not necessarily the downstream outcome that system was built to improve; a building-plan approval processed in days rather than months is a genuine efficiency gain, but it says nothing about whether the underlying plan review was substantively rigorous, just as the Single Window Portal's processing speed for industrial applications, documented in Chapter 4.2, says nothing about whether the incentives approved through it are being correctly verified against actual investment outcomes, the same verification gap this framework's Chapter 4.1 discussion of the state's grounded-investment claims documented at length. Treating award-winning digital throughput and substantive regulatory or institutional quality as the same achievement would be a mistake this framework's evidence does not support making.

15.7 Civil service strength: Vacancy rates and Training institutions

Uttarakhand's civil service architecture rests on the Provincial Civil Service, founded on 15 May 2001, comprising Group A and Group B posts and serving as the feeder service for the Indian Administrative Service in the state, with the Department of General Administration as its cadre-controlling authority (Wikipedia, n.d.). The state's IAS cadre has historically run well short of its sanctioned strength: out of a sanctioned strength of 120 IAS officers, 83 posts were filled, but 16 of those officers were on Central deputation, leaving only 67 IAS officers actually serving the state, with just 9 officers working against 21 sanctioned super-time-scale posts, prompting the sitting Chief Minister to write to the Central Government requesting release of officers who had completed their central deputation terms (Tribune News Service, n.d.). More recent data suggests the underlying tension between state cadre needs and central deputation has persisted: Uttarakhand had 31 percent of its reserved

cadre officers on central deputation as of 2024, a moderate rate relative to states such as Punjab (40 percent) and Odisha (35 percent) (The Secretariat, 2024), while nationally, as of February 2026, there was a reported shortage of around 1,300 IAS officers, with 5,577 officers in position against 6,877 sanctioned posts (The Secretariat, 2026), an all-India pattern of structural civil service understaffing this framework has no reason to believe has spared Uttarakhand specifically, though a fully current, disaggregated 2025 or 2026 vacancy count specific to the state's own IAS cadre could not be confirmed from the sources available for this chapter.

At the state civil service level, recruitment continues on a smaller but steady annual cycle: the Uttarakhand Public Service Commission's Combined Upper Subordinate Service Examination 2026 notified 63 vacancies for direct recruitment across various departments (Testbook, 2026), continuing the pattern of modest annual intake this framework has documented straining to keep pace with the departmental proliferation described in section 15.1. In April 2026, the state government transferred six IAS and 26 Provincial Civil Service officers in a late-night decision explicitly timed to re-energise district administration as the Char Dham Yatra commenced, redeploying Additional District Magistrates, City Magistrates, Deputy Collectors and officials in various commissions and departments (The Secretariat, 2026), though frequent reshuffling of this kind carries its own administrative continuity cost even when well-intentioned.

Training for both the IAS and Provincial Civil Service cadres runs through the Dr. Raghunandan Singh Tolia Uttarakhand Academy of Administration in Nainital. The institute was established as Officers Training School (OTS) at Allahabad in 1951 to impart professional training to IAS officers allotted to the UP cadre, Provincial Civil Service (Executive) officers and Provincial Judicial Service officers, and was shifted to Nainital in 1971 to its present campus, popularly known as Ardwell Camp (Uttarakhand Academy of Administration, n.d.). In 1974 the institution was renamed Administrative Training Institute, in 1988 raised to Uttar Pradesh Academy of Administration status, renamed Uttaranchal Academy of Administration in 2000, and later renamed after former Chief Secretary Dr. Raghunandan Singh Tolia; the Academy is one of five Regional Training Centres in the country under the jointly sponsored Trainer Development Project of the Government of India's Training Division, DoPT, and the British Commonwealth (Uttarakhand Academy of Administration, n.d.), positioning it as a training resource whose reach extends somewhat beyond Uttarakhand's own cadre needs alone. Whether the Academy's training capacity and curriculum have kept pace with the state's more recent administrative demands, digital governance systems, disaster response coordination, and the seasonal pilgrimage administration burden this framework has documented repeatedly, is a question this chapter's sources could not answer definitively, but the persistent gap between sanctioned and working strength documented above across both the IAS cadre and the judiciary suggests that training capacity, however well regarded, cannot substitute for the more basic task of recruiting and retaining enough officers to fill the state's sanctioned administrative and judicial posts in the first place.

Read together, this chapter's seven subsections describe a state administration that has invested unevenly across its governance functions: genuinely strong and internationally recognised digital service-delivery infrastructure sits alongside a years-long vacancy in the state's principal anti-corruption ombudsman office, a judiciary whose pendency has grown faster than nearly any other state's over the past decade, and a civil service cadre that has run persistently short of its own sanctioned strength since at least the mid-2010s. None of these gaps is unique to Uttarakhand, and several, Lokayukta vacancies, IAS shortages, judicial pendency, are recognised national patterns this chapter has situated Uttarakhand within rather than treated as sui generis failures. But the state's particular combination of a demanding, terrain-driven administrative burden and a persistently under-strength officer corps to carry it means that closing these staffing and appointment gaps deserves at least as much priority in the state's governance reform agenda as the digital simplification initiatives that have, so far, drawn the more visible national recognition documented in section 15.6

CHAPTER 16: TECHNOLOGY-ENABLED SERVICE DELIVERY

16.1 Digital Infrastructure: Broadband, Optical Fibre and Connectivity Coverage

Uttarakhand's digital infrastructure has advanced considerably under the state government's August 2025 "Hill se Hi-Tech" initiative, launched by Chief Minister Pushkar Singh Dhami from the Mukhya Sevak Sadan at the Chief Minister's camp office, which introduced a next-generation state data centre alongside a broader Information and Communication Technology enabled services programme intended to transform the state's governance, service delivery, and economic growth architecture (Hill to Hi-Tech, The Week, 2025). This programme's explicit framing, transforming a hill state into a technologically advanced one, reflects a deliberate policy wager that digital infrastructure investment can substitute for, or at minimum meaningfully complement, the physical connectivity constraints discussed throughout Chapter 8, allowing citizens and government offices in the state's mountainous terrain to access services and information without the delay and difficulty that physical travel across Uttarakhand's difficult geography, discussed in Chapter 1, otherwise imposes.

The choice of the phrase "hill se hi-tech", literally "from hill to high-tech", as the organising slogan for this initiative carries a symbolic significance worth noting explicitly, since it directly inverts the historical narrative of Uttarakhand's hill districts as a source of outmigrating labour and underdevelopment, discussed extensively in Chapters 1 and 12, reframing the hills instead as the origin point of the state's technological advancement rather than merely its beneficiary. Whether this rhetorical reframing translates into genuine, measurable improvement in digital service access specifically within the hill districts, rather than concentrating primarily in Dehradun and the state's other plains urban centres as has historically occurred with previous waves of infrastructure investment discussed throughout this framework, will be an important test of the initiative's substantive rather than merely symbolic success.

The National Informatics Centre's Uttarakhand unit maintains dedicated district offices across all thirteen of the state's districts, from Dehradun and Haridwar in the plains to Uttarkashi and Pithoragarh in the high Himalaya, providing computerisation support, cloud services, domain registration, email, video conferencing, and cybersecurity infrastructure to government offices throughout the state (Home, Uttarakhand State Unit Website, National Informatics Centre, 2026). More than 26,000 government email accounts have been created for official use across the state's administrative apparatus, reflecting the scale of digital identity infrastructure now underpinning routine government communication and workflow, a foundation that did not exist in comparable form even a decade ago (Uttarakhand, the Land of Gods, is Embracing Digital Transformation, National Informatics Centre, 2025).

This district level presence of the National Informatics Centre, extending genuinely uniformly across both the state's plains and its most remote hill districts, represents an important structural counterexample to the broader pattern of hill-plains infrastructure disparity documented throughout this framework, since it indicates that at least the basic institutional presence required to deliver digital government services exists in every one of Uttarakhand's thirteen districts, even if the quality and reliability of the underlying connectivity infrastructure connecting these district offices to end users, discussed further in this section, continues to vary considerably between the state's better connected plains areas and its more remote hill settlements.

Beyond this conventional information technology infrastructure, the Uttarakhand Space Application Centre, constituted as an autonomous organisation in 2005 under the state's Department of Science and Technology, represents a genuinely distinctive digital infrastructure institution reflecting the state's specific geographic circumstances, established explicitly in recognition of the state's acute vulnerability to Himalayan fragility and intensifying climate change, and mandated to deploy space technology for the direct benefit of the state's population (Homepage, Uttarakhand Space Application Centre, 2026). The Centre's continued institutional development, including an active recruitment process for a Director position advertised in February 2026, indicates sustained state commitment to building indigenous geospatial and remote sensing capacity specifically tailored to Uttarakhand's mountainous terrain, rather than relying exclusively on centrally provided satellite and remote sensing services designed without specific reference to the state's particular Himalayan monitoring requirements, discussed further in section 16.6.

The twenty year continuity of the Uttarakhand Space Application Centre's operation, spanning the period since its 2005 establishment through its current 2026 recruitment activity, offers a useful point of comparison against the more recently launched Hill se Hi-Tech initiative discussed throughout this chapter, illustrating that the state's engagement with advanced digital and space technology is not an entirely new phenomenon prompted solely by the 2025 initiative, but rather builds on an institutional foundation that has been developing steadily for two decades. This longer institutional history suggests a genuine, sustained state commitment to technology-enabled governance in service of its specific Himalayan circumstances, rather than a purely reactive or politically opportunistic technology announcement disconnected from prior institutional investment, a distinction that carries some reassurance regarding the likely durability of the state's current, more ambitious technology transformation programme discussed throughout this chapter.

16.2 e-Governance Architecture and Digital Public Infrastructure

Uttarakhand's core e-governance architecture centres on the Digital Uttarakhand app, launched as part of the August 2025 Hill se Hi-Tech initiative discussed in section 16.1, designed as a unified digital governance ecosystem offering a single platform through which both citizens and government officials can access services, described by the state government as the flagship instrument through which the broader technology transformation programme will be delivered to the population (Hill to Hi-Tech, The Week, 2025). This unified platform

approach mirrors the digital public infrastructure strategies pursued by several other Indian states, discussed in comparative analysis elsewhere in this framework series, consolidating what would otherwise be a fragmented landscape of separate departmental digital services into a single citizen facing access point.

The genuine value of this unified app approach for Uttarakhand specifically lies less in the convenience benefit it offers plains urban residents, who in many cases already possess reasonably reliable access to individual departmental websites and services, and more in the potential it offers hill district residents, discussed throughout this framework, to access the full range of state government services through a single, consistently designed mobile application rather than needing to separately locate, learn, and navigate dozens of individual departmental digital properties, each potentially built with different levels of technical sophistication and mobile optimisation. Realising this potential benefit fully will depend on the underlying mobile network connectivity discussed in the rural infrastructure context of Chapter 12 reaching a sufficient standard across the state's hill districts, since a unified app, however well designed, cannot deliver its intended benefit to citizens whose mobile signal reliability remains as inconsistent as this framework has documented in several of the state's remote settlements.

The state's eCabinet system, which digitises Cabinet meeting proceedings through paperless workflows and secure remote access, represents one of Uttarakhand's most nationally significant digital governance exports, having been adopted not only within the state itself but replicated in five other Indian states, Maharashtra, Andhra Pradesh, Tripura, Uttar Pradesh, and Arunachal Pradesh, indicating that Uttarakhand's National Informatics Centre unit has developed genuine technical capability recognised and adopted well beyond the state's own borders (Uttarakhand, National Informatics Centre, 2026). This inter-state technology transfer, from a comparatively small state such as Uttarakhand to considerably larger states including Maharashtra and Uttar Pradesh, offers an instructive counterpoint to the more conventional assumption that digital governance innovation flows primarily from India's largest and most resource rich states outward to smaller ones, demonstrating that a state's population and economic scale, discussed in Chapters 1 and 3, need not determine its capacity for genuine technical innovation in specific, well-scoped governance domains.

The National eVidhan Application, a national Digital India Mission Mode Project aimed at making state legislatures fully paperless, was formally inaugurated in Uttarakhand on 18 February 2025 by the Chief Minister and the Speaker of the Uttarakhand Vidhan Sabha jointly, extending this paperless governance principle from the executive Cabinet process to the state's legislative proceedings as well (Uttarakhand, the Land of Gods, is Embracing Digital Transformation, National Informatics Centre, 2025). Beyond its immediate paper reduction and workflow efficiency benefits, this digitisation of legislative proceedings offers an important, if less immediately visible, transparency benefit, since digitally recorded and searchable legislative records make it considerably easier for citizens, journalists, and researchers, including those compiling frameworks of this kind, to track legislative history, committee proceedings, and voting records than would be possible with conventional paper

based legislative archives, a benefit connected to the accountability architecture discussed in Chapter 15.

The state's adoption of the S3WaaS cloud framework, a national Digital India platform enabling departments to rapidly develop secure, scalable, and accessible government websites, has resulted in the development of numerous department websites hosted on this shared infrastructure, with figures cited between 77 and 100 government websites depending on the specific reporting period, reflecting continued expansion of the state's departmental digital presence built on this shared national technical foundation rather than requiring each department to develop bespoke website infrastructure independently (Uttarakhand, National Informatics Centre, 2026; Home-2, Uttarakhand State Unit Website, 2026). This shared infrastructure approach offers meaningful efficiency advantages for a state of Uttarakhand's comparatively modest administrative scale, discussed in the fiscal context of Chapter 2, since it avoids the duplicated technical development cost that a more fragmented, department by department website development approach would otherwise impose.

16.3 Citizen Service Delivery: CSCs, Service Portals and Mobile Governance

Citizen facing digital service delivery in Uttarakhand has expanded substantially through sector specific portals addressing the state's most significant public service domains. The NextGen eHospital application, a Software as a Service hospital management system implemented across government hospitals nationwide including within Uttarakhand, enhances patient care, digital medical record management, and hospital operational efficiency, directly supporting the health system strengthening priorities discussed in Chapter 6, particularly relevant given the geographic dispersal of the state's hill population and the corresponding importance of digital medical records that can follow a patient across different treatment facilities without requiring physical record transport across difficult mountain terrain (Uttarakhand, National Informatics Centre, 2026).

This digital medical record portability carries a specific and important application within Uttarakhand's healthcare referral pathway, discussed in Chapter 6, since patients from the state's remote hill Primary Health Centres are frequently referred onward to larger district hospitals or the tertiary care facilities concentrated in Dehradun and Haridwar, a referral chain that, absent digital record continuity, has historically required patients or their families to physically carry paper records between facilities, risking loss, damage, or simple delay in a context where the underlying medical condition may itself be urgent. A functioning digital hospital record system that follows the patient electronically through this referral chain therefore offers a meaningfully different, and considerably safer, care continuity experience than the paper based alternative it replaces, particularly for patients undertaking the long and difficult journey from a remote hill village to Dehradun's tertiary facilities.

The state's School Education Portal, an artificial intelligence enabled platform supporting student and teacher management alongside transparent Right to Education Act seat allotment processes, extends this citizen service digitisation into the education sector discussed in Chapter 5, offering a technology based mechanism for ensuring RTE mandated seat

reservations are allocated transparently and verifiably rather than through the more opaque manual allocation processes that have historically drawn scrutiny in RTE implementation across many Indian states (Uttarakhand, National Informatics Centre, 2026). Water and sanitation service delivery has similarly been digitised through dedicated portals operated by the Pey Jal Nigam and Jal Sansthan, the state's principal water supply agencies, incorporating Supervisory Control and Data Acquisition and Internet of Things based real-time monitoring of water supply infrastructure, a capability of particular significance given the water security challenges discussed throughout Chapter 10 (Uttarakhand, National Informatics Centre, 2026).

This real-time water infrastructure monitoring capability offers particular value for a state whose water supply systems, discussed in Chapter 10, must contend with the seasonal variability of glacial and monsoon fed hill hydrology alongside the physical vulnerability of pipeline infrastructure to landslide and earthquake damage, discussed in Chapter 14, since Internet of Things based sensors can alert the Jal Sansthan to a supply disruption or infrastructure failure considerably faster than the conventional model of waiting for citizen complaints to reach the department through manual channels, particularly relevant in remote hill areas where a pipeline break might otherwise go unreported for an extended period given the sparse population and difficult terrain surrounding much of the state's rural water infrastructure.

The StarBus platform, a comprehensive bus booking and management system incorporating real-time GPS tracking and integration with major national travel booking platforms including RedBus and MakeMyTrip, extends the state's citizen service digitisation into public transport, discussed in the broader connectivity context of Chapter 8, offering travellers and pilgrims, particularly those undertaking the Char Dham Yatra discussed in Chapter 19, a modern, digitally accessible booking experience for state transport services that had historically depended on manual, counter based ticketing processes poorly suited to the scale of seasonal pilgrimage demand the state's transport network must accommodate. The Vehicle Location Tracking and Emergency Alert System, another Uttarakhand developed digital governance tool enhancing vehicle safety through GPS tracking and emergency alert functionality, has likewise been adopted across nine other states and union territories, Bihar, Goa, Chandigarh, Andaman and Nicobar Islands, Rajasthan, Mizoram, Haryana, Uttar Pradesh, and Delhi, further illustrating the genuine technical export capability Uttarakhand's digital governance development has achieved (Uttarakhand, National Informatics Centre, 2026).

This vehicle tracking and emergency alert capability carries particular safety significance for Uttarakhand's own mountain highway network, discussed in Chapter 8, where the combination of steep gradients, hairpin bends, and periodic landslide or fog related visibility reduction creates genuine road safety risk for both pilgrim traffic and freight movement, meaning that a GPS tracked emergency alert system offers considerably faster incident detection and emergency response dispatch than would be possible relying on manual reporting from a vehicle breakdown or accident occurring in a remote mountain location with

limited mobile signal, connecting this citizen service delivery tool directly to the disaster and emergency response priorities discussed in Chapter 14.

16.4 Data Governance, Open Data Policy and Privacy Framework

Data governance within Uttarakhand's digital public infrastructure has assumed particular significance following the state's implementation of the Uniform Civil Code, discussed in the Preface and Chapter 15, since the Code's mandatory registration requirements for marriage, divorce, and live-in relationships are administered through a dedicated UCC Portal requiring registrars and sub-registrars across the state's block level administrative structure to process what constitutes an entirely new category of sensitive personal data collection at population scale (Training Sessions Underway for Govt Officials on UCC Portal, News on Air, 2025). Specialised training sessions for government officials on this portal's operation commenced in districts including Chamoli and Rudraprayag from January 2025, with senior State Secretariat officials overseeing the rollout to ensure block-wise nominated registrar and sub-registrar personnel could competently manage online form submission, application processing, and the portal's various technical requirements (Training Sessions Underway for Govt Officials on UCC Portal, News on Air, 2025).

The scale and pace of this training rollout, extending block by block across the state's thirteen districts through structured, sequential sessions rather than a single centralised training event, reflects a reasonably cautious and methodical approach to introducing genuinely novel legal and administrative processes at the grassroots level, an approach this framework regards as appropriate given the sensitivity and complexity of the underlying legal requirements the UCC Portal's registrar personnel must now interpret and apply correctly. The alternative, a more rushed rollout without adequate personnel preparation, would have risked exactly the kind of implementation error and citizen grievance that could undermine public confidence in the Uniform Civil Code's administration during its earliest and most closely scrutinised period of operation, both within Uttarakhand and, given the Code's status as the first such implementation in independent India, discussed in the Preface, before a national audience watching closely for lessons applicable to their own states.

The genuinely novel and sensitive nature of the personal data the UCC Portal collects, spanning live-in relationship registration in particular, a category of intimate personal information not previously subject to any formal state registration requirement anywhere in India, creates data governance responsibilities considerably beyond those associated with more conventional government service portals discussed elsewhere in this chapter. Ensuring that access controls, data retention policies, and disclosure safeguards applied to this UCC Portal data are calibrated to the genuine sensitivity of the information involved, rather than defaulting to the access and retention standards appropriate for more routine administrative data, represents an important and, given the Code's unprecedented nature within Indian governance, largely untested data governance priority for the state's Information Technology Department.

This sensitivity is compounded by the specific social context within which live-in relationship registration operates in much of Uttarakhand's population, discussed in the cultural context of Chapter 1, where such relationships may not be openly acknowledged within a person's family or community network even where the relationship itself is entirely legal, meaning that any data breach or inappropriate disclosure from the UCC Portal carries potential consequences for registrants extending well beyond the kind of inconvenience typically associated with a conventional government data breach, into territory that could affect family relationships, social standing, and in some cases personal safety. This elevated stakes context should inform not merely the technical security standards applied to the UCC Portal's underlying database infrastructure but also the specific access permission architecture governing which categories of government official can view which fields of registrant data, ensuring that access is genuinely restricted to personnel with a demonstrated operational need rather than broadly available across the state's registrar administrative hierarchy.

The State Tax Dashboard's integration of Goods and Services Tax analytics with artificial intelligence based fraud detection and face-recognition gate pass systems, discussed further in the emerging technology context of section 16.6, similarly involves the processing of commercially sensitive taxpayer data and biometric information, requiring data governance standards consistent with the broader national Digital Personal Data Protection Act framework discussed in this framework's companion state analyses (Uttarakhand, National Informatics Centre, 2026). Developing a coherent, state-wide data governance policy that addresses both the UCC Portal's uniquely sensitive personal data and the State Tax Dashboard's biometric and commercial data within a single consistent framework, rather than allowing each portal to develop its own ad hoc data handling standards, represents an important priority for the state's continued digital governance maturation.

16.5 Cybersecurity: State-Level Institutional Mechanisms

Cybersecurity infrastructure within Uttarakhand's digital governance architecture is substantially supported by the National Informatics Centre's district level offices, present across all thirteen of the state's districts, discussed in section 16.1, which provide cybersecurity services alongside their broader cloud, networking, and data centre support functions (Home-2, Uttarakhand State Unit Website, 2026). This district level cybersecurity support infrastructure carries particular importance given the state's rapidly expanding portfolio of citizen facing digital services discussed throughout this chapter, since each new digital touchpoint, whether the UCC Portal discussed in section 16.4, the School Education Portal discussed in section 16.3, or the State Tax Dashboard discussed in section 16.6, represents an additional potential vector for cyberattack that the state's cybersecurity infrastructure must be resourced to defend.

The recognition documented in the National Informatics Centre's own reporting that the Uttarakhand team's efforts in restoring the State Data Centre following a disruption merited specific institutional acknowledgement suggests that the state's cybersecurity and infrastructure resilience apparatus has already been tested by at least one significant operational incident, and that the response to that incident was considered successful enough

to warrant formal recognition (Home-2, Uttarakhand State Unit Website, 2026). While the specific nature of this disruption is not detailed in the available reporting, its occurrence and the subsequent recovery underscore the practical, rather than purely theoretical, importance of the cybersecurity and business continuity infrastructure this section discusses, since digital government services are only as valuable to citizens as the reliability with which the underlying infrastructure can be sustained and, when disrupted, restored.

Public cybersecurity awareness and digital literacy programming has extended beyond government infrastructure protection alone to encompass citizen facing education, with Safer Internet Day workshops conducted across all thirteen districts on 11 February 2025, engaging approximately 1,300 participants including government officials and members of the public in digital safety awareness training (Uttarakhand, the Land of Gods, is Embracing Digital Transformation, National Informatics Centre, 2025). This citizen facing cybersecurity awareness effort complements the more technical, infrastructure focused cybersecurity work performed by the National Informatics Centre, recognising that digital service delivery security depends not only on robust backend infrastructure but on citizen users themselves understanding basic digital safety practices, particularly relevant given the expanding smartphone access among school age children and the broader population discussed in the digital education context of Chapter 5.

The genuinely uniform reach of these Safer Internet Day workshops across all thirteen districts, rather than concentration in Dehradun and the state's other plains urban centres alone, represents a meaningful departure from the broader hill-plains disparity pattern documented throughout this framework, suggesting that at least this specific citizen facing cybersecurity awareness initiative was deliberately designed and resourced to reach the state's hill district population on comparable terms to its plains population, a design principle this framework recommends the state's broader digital literacy and citizen education programming should seek to replicate more consistently across its other technology initiatives discussed throughout this chapter.

Capacity building for the government officials responsible for operating and securing the state's expanding digital infrastructure has proceeded through a structured training programme, with twelve distinct training programmes conducted for National Informatics Centre officers covering management, technology, and induction training, complemented by post-training knowledge sharing sessions intended to disseminate learning beyond the immediate training participants to their broader departmental colleagues (Uttarakhand, the Land of Gods, is Embracing Digital Transformation, National Informatics Centre, 2025). Sustaining this training cadence, and extending it to keep pace with the rapidly expanding scope of digital services discussed throughout this chapter, represents an essential, ongoing priority given that cybersecurity threats and best practices continue to evolve considerably faster than any single training cycle can fully anticipate.

16.6 Emerging Technologies: AI, Geospatial Systems and Smart Governance

Uttarakhand has established a genuinely ambitious institutional foundation for artificial intelligence adoption in governance through the state's newly launched AI Mission, announced as part of the August 2025 Hill se Hi-Tech initiative discussed throughout this chapter, explicitly designed to integrate artificial intelligence across governance, ecology, disaster management, healthcare, tourism, education, and agriculture, anchored by a dedicated centre of excellence intended to serve as the mission's technical nucleus (Hill to Hi-Tech, The Week, 2025). This cross-sectoral design, spanning nearly every major sectoral chapter examined throughout this framework, reflects a deliberate policy choice to treat artificial intelligence not as a narrow information technology initiative but as a genuinely cross-cutting governance transformation tool, with the state government specifically citing improved resource allocation and employment generation among the mission's intended outcomes.

Among the sectoral applications the AI Mission specifically names, its inclusion of ecology and disaster management alongside the more conventional governance, healthcare, and education domains deserves particular emphasis given this framework's repeated identification, across Chapters 1, 10, 13, and 14, of Uttarakhand's ecological fragility and disaster exposure as the state's single most consequential and distinctive development challenge. Artificial intelligence applications with genuine potential within this specific domain include machine learning based analysis of satellite imagery to detect early signs of slope instability before a landslide occurs, pattern recognition models trained on historical glacial lake behaviour to improve glacial lake outburst flood early warning accuracy beyond what the heat-health and general disaster warning systems discussed in Chapter 14 currently provide, and predictive modelling of Char Dham Yatra pilgrim flow to help authorities anticipate and manage the crowd density and carrying capacity concerns discussed in the tourism context of Chapter 19 before they escalate into safety incidents.

Complementing this AI Mission, the state government has announced plans for a next-generation remote sensing and drone application centre, extending the geospatial monitoring capability already established through the Uttarakhand Space Application Centre discussed in section 16.1, and directly relevant to the disaster risk monitoring priorities discussed in Chapter 14, where satellite and drone based monitoring of glacial lakes, landslide prone slopes, and Char Dham road corridor conditions offers considerably faster and safer hazard assessment than ground based survey methods alone can provide across the state's difficult and often inaccessible high altitude terrain. The state government has further signalled its intention to establish a dedicated Information Technology cadre within the state civil service, a specialised recruitment and career stream intended to ensure that the technical capacity underlying this expanding digital and artificial intelligence infrastructure is sustained by career civil servants with genuine technical expertise, rather than depending indefinitely on general administrative service officers rotated through technology roles without specialised training (Hill to Hi-Tech, The Week, 2025).

This proposed dedicated Information Technology cadre represents a particularly significant institutional commitment worth examining alongside the civil service capacity themes discussed in Chapter 15, since most Indian states have historically staffed their information technology functions through a combination of the Indian Administrative Service officers rotated through technology focused postings without necessarily possessing deep prior technical training, and outsourced private sector technical contractors who may lack the institutional continuity and accumulated departmental knowledge that career civil servants develop over successive postings. A dedicated Information Technology cadre, if successfully established and adequately resourced, would allow Uttarakhand to build precisely this kind of sustained, institutionally embedded technical expertise, potentially positioning the state's digital governance capability to continue advancing even as the specific individuals occupying senior political and administrative leadership positions change over successive electoral cycles, an institutional durability consideration this framework has emphasised throughout its analysis of Uttarakhand's broader governance architecture.

Practical applications of artificial intelligence already operational within the state's governance architecture illustrate the tangible, near-term potential of this broader mission, including the Raj Bhawan Automation system's use of face recognition and chatbot technology for Governor's Secretariat operations, and the State Tax Dashboard's integration of artificial intelligence based fraud detection with face-recognition gate pass systems for revenue administration, discussed in section 16.4 (Uttarakhand, National Informatics Centre, 2026). These early, sector specific artificial intelligence deployments provide a practical foundation and demonstrated proof of concept from which the more ambitious, cross-sectoral AI Mission can draw lessons as it scales artificial intelligence adoption across the full range of governance domains this section has discussed, provided the state maintains the data governance and cybersecurity safeguards discussed in sections 16.4 and 16.5 as this technology adoption continues to accelerate across Uttarakhand's uniquely challenging and consequential Himalayan governance context.

Taken as a whole, the technology enabled service delivery architecture examined throughout this chapter, spanning the state's expanding data centre and Space Application Centre infrastructure discussed in section 16.1, its nationally exported eCabinet and vehicle tracking innovations discussed in section 16.2, its sector specific citizen service portals discussed in section 16.3, its genuinely novel UCC Portal data governance challenge discussed in section 16.4, its district-wide cybersecurity awareness programming discussed in section 16.5, and its ambitious cross-sectoral AI Mission discussed in this section, positions Uttarakhand as a genuinely active and, in several specific instances, nationally leading innovator within India's state level digital governance landscape. Whether this technological ambition translates into the kind of tangible, broadly distributed service delivery improvement that reaches the state's hill district population as consistently as its plains population, discussed as an open question throughout this chapter, will represent the ultimate measure of whether Uttarakhand's hill se hi-tech vision succeeds in genuinely transforming citizen experience rather than remaining primarily an institutional and infrastructure achievement visible chiefly to the state's own administrative apparatus.

CHAPTER 17: INNOVATION, RESEARCH AND KNOWLEDGE ECONOMY

17.1 State Innovation Ecosystem: Startups and Accelerators

Uttarakhand's startup ecosystem has developed around a distinctive combination of private university incubators, central government backed technology business incubators, and state level facilitation programmes, rather than the single unified state managed platform that anchors several larger Indian states' startup strategies. The state's own Startup Policy, developed with active support from the national Startup India team's state engagement programme, provides the underlying framework of funding, mentorship, and market access support intended to help early stage enterprises grow into meaningful contributors to state revenue and employment, alongside specific incentive provisions for the incubators and higher education institutions that serve as the ecosystem's primary delivery channels (Uttarakhand, Startup India, 2026).

Among these institutional channels, the Technology Business Incubator based at Tula's Institute in Dehradun, established under the Department of Science and Technology's national technology business incubator programme, focuses specifically on dairy and food processing, electronic equipment development, computer software and hardware development, chemical product development, and bio-fertiliser and bio-pesticide innovation, including panchgavya based agricultural products drawing on traditional Indian agricultural practice (Incubators Are Driving the Startup Ecosystem in Uttarakhand, Inc42, 2020). This sectoral focus reflects a deliberate alignment between the state's incubation infrastructure and its underlying economic base, discussed in Chapters 3 and 18, prioritising agri-tech and food processing innovation given the state's substantial horticultural and dairy sector rather than attempting to replicate the more generic information technology and consumer internet startup focus that characterises incubation programmes in India's larger metropolitan startup hubs.

The University of Petroleum and Energy Studies' Centre for Innovation and Entrepreneurship, working in partnership with JumpStart, the first private sector co-working hub and incubator established in Dehradun, provides networking, seed funding facilitation, marketing support, and strategic partner linkages for innovative startups, and holds membership in the University Business Incubator Global network, an international platform connecting corporations and governments with innovative entrepreneurs worldwide (UPES Centre for Innovation and Entrepreneurship, UPES, 2026). This international network membership offers Uttarakhand's startup ecosystem a connection to global entrepreneurship resources and best practice that a purely domestically focused incubation programme would not otherwise provide, a meaningful asset for a state whose overall economic scale, discussed in Chapter 3, is more modest than India's largest startup hub states.

State government facilitation programmes complementing this institutional incubator infrastructure include the Startup Yatra outreach initiative, Angel Investment Workshops

connecting early stage enterprises with potential investors, and the Startup Grand Challenge competition format, together constituting a broader ecosystem building effort beyond the incubators themselves (Incubators Are Driving the Startup Ecosystem in Uttarakhand, Inc42, 2020). The planned establishment of a Dehradun chapter of TiE, The Indus Entrepreneurs, a globally recognised entrepreneurship support network, represents a further step toward integrating Uttarakhand's startup ecosystem with established national and international entrepreneurship support structures, extending the state's ecosystem building efforts beyond government programming alone toward the kind of peer mentorship and investor network access that established entrepreneurship organisations typically provide.

This combination of institutional channels, university based incubators, central government technology business incubator infrastructure, private sector co-working and incubation facilities, and state government facilitation programming, together constitutes a genuinely multi-layered ecosystem, even if it remains considerably less centrally coordinated than the more unified, single-platform startup ecosystems some larger Indian states have developed, discussed in comparative analysis elsewhere in this framework series. Whether this more distributed institutional model ultimately proves more or less effective than a unified platform approach for a state of Uttarakhand's specific scale and sectoral composition represents an open empirical question this framework does not attempt to resolve definitively, though the sectoral alignment between the state's incubation infrastructure and its underlying agricultural and forestry economy, discussed throughout this chapter, suggests the current distributed model has at minimum avoided the risk of establishing a generic, one-size-fits-all innovation infrastructure disconnected from the state's actual economic base.

Funding access remains a genuine constraint for Uttarakhand's startup ecosystem relative to India's largest venture capital hubs, since institutional venture capital firms remain heavily concentrated in Bengaluru, Mumbai, and Delhi NCR, discussed in comparative state analysis elsewhere in this framework series, meaning that Uttarakhand founders typically must travel outside the state, or rely on the Angel Investment Workshops and seed funding facilitation discussed above, to access anything beyond the earliest, smallest scale of investment capital. Strengthening direct venture capital engagement with Uttarakhand's ecosystem, potentially through dedicated regional investor networking events explicitly targeting funds with an interest in agri-tech, forestry technology, and sustainable tourism given the state's sectoral strengths discussed throughout this chapter, would help address this funding access gap without requiring the state itself to establish a costly dedicated venture capital fund of its own.

17.2 Research and Development: Academic-Industry Linkages

Dehradun's concentration of premier national research institutions gives Uttarakhand a research and development density considerably exceeding what its comparatively modest population and economic scale, discussed in Chapters 1 and 3, would ordinarily suggest. The Forest Research Institute, established during the colonial era and now operating as a Deemed to be University under the Indian Council of Forestry Research and Education, represents one of Asia's oldest and most significant forestry research institutions, conducting sustained

research across forest ecology, wood science and technology, land degradation mitigation, and agroforestry, with recent training programmes extending specifically to hill agroforestry practices directly relevant to the land use and forest governance priorities discussed in Chapter 13 (Forest Research Institute, Dehradun, 2026).

The Indian Council of Forestry Research and Education, the Forest Research Institute's parent autonomous organisation under the Ministry of Environment, Forest and Climate Change, operates with a budget of Rs 354 crore for the 2025-26 financial year, reflecting the continued national significance of the forestry research function this Dehradun headquartered institution performs on behalf of the entire country, not merely Uttarakhand itself (Indian Council of Forestry Research and Education, Wikipedia, 2026). This national mandate creates a distinctive academic-industry and academic-government linkage opportunity for Uttarakhand, since research generated within the state's own borders directly informs forest and land management policy applied across every other Indian state, discussed further in the environmental governance context of Chapter 13, giving Uttarakhand's research institutions an outsized voice in national environmental policy relative to the state's own modest size.

This outsized national policy influence deserves particular emphasis given the broader pattern this framework has documented throughout, in which Uttarakhand's modest population and economic scale, discussed in Chapters 1 and 3, might otherwise suggest a correspondingly modest national policy voice. The Forest Research Institute's continued research output, including its recent special issue call for papers on land restoration explicitly connected to national desertification and land degradation concerns, illustrates how a research institution physically located within a comparatively small state can nonetheless exercise policy influence considerably disproportionate to that state's conventional political or economic weight, a genuine, if underappreciated, form of soft power that Uttarakhand's policymakers should consider more deliberately when framing the state's broader national influence and negotiating position, discussed further in the centre-state relations context of Chapter 2.

Beyond forestry, Dehradun hosts the Wildlife Institute of India, a premier national centre for wildlife research and conservation training directly relevant to the biodiversity and protected area management priorities discussed in Chapter 13, alongside the Indian Institute of Petroleum, a Council of Scientific and Industrial Research constituent laboratory focused on petroleum refining and petrochemical research, and the headquarters of the Survey of India, the country's oldest scientific department responsible for national mapping and geospatial data, an institution of direct relevance to the geospatial and remote sensing priorities discussed in the emerging technology context of Chapter 16. This unusual concentration of specialised national research institutions within a single, comparatively small state capital reflects Dehradun's historical role as a preferred location for colonial and subsequently independent India's scientific and survey establishments, a legacy asset this framework treats as a genuine, if not always fully leveraged, foundation for the state's broader knowledge economy ambitions.

Strengthening formal collaborative linkages between these Dehradun based national research institutions and the state's own industrial base, discussed in Chapter 4, particularly its

pharmaceutical manufacturing cluster in Haridwar and Udham Singh Nagar, remains an area of continued development opportunity, since these institutions' research mandates, while nationally significant, have not always been explicitly structured to generate direct commercial spillover benefit for Uttarakhand's own private sector, a gap this framework's innovation strategy recommendations, discussed in section 17.6, seek to address.

This gap between nationally mandated research and locally captured commercial benefit is not unique to Uttarakhand, reflecting a broader pattern across India in which centrally funded national research institutions are typically evaluated against nationally defined research output metrics rather than against any specific obligation to generate commercial or employment benefit for their host state. Nonetheless, the sheer concentration of such institutions within Uttarakhand specifically, discussed throughout this section, means that the state has a proportionally larger stake than most in finding mechanisms to bridge this gap, potentially through state government co-funded joint research programmes explicitly designed to pair Dehradun's research institutions with the state's own industrial and agricultural enterprises, ensuring that at least a defined portion of the research capacity located within Uttarakhand's borders is directed toward problems of specific, immediate relevance to the state's own economy rather than exclusively toward the national research priorities these institutions' parent ministries define.

17.3 Intellectual Property: Awareness, Registration and Commercialisation

Intellectual property generation within Uttarakhand's research ecosystem is anchored substantially by the state's academic and research institutions rather than by a dedicated state government intellectual property incentive scheme of the kind some other Indian states have established. The Forest Research Institute Deemed to be University maintains a dedicated Entrepreneurship Development and Incubation Cell specifically inviting submission of innovative ideas, project proposals, and startup proposals from its research community, providing an institutional pathway through which research generated within the university's forestry, wood science, and environmental research programmes can be evaluated for commercial potential and intellectual property protection (Forest Research Institute Deemed University Dehradun, 2026).

This institution specific approach to intellectual property commercialisation, embedded within individual research institutions rather than coordinated through a single state-wide intellectual property facilitation body, reflects the somewhat fragmented character of Uttarakhand's broader innovation ecosystem discussed throughout this chapter, in which national research institutions, private university incubators, and state government programmes each operate with a degree of independence rather than through a fully integrated state innovation strategy. Given the genuine research output these institutions generate, particularly in forestry, wildlife, and petroleum science discussed in section 17.2, establishing a more coordinated state-wide intellectual property awareness and commercialisation support framework, potentially modelled on the patent registration and geographical indication support incentives other Indian states have introduced, discussed in comparative analysis elsewhere in this framework series, represents a meaningful opportunity

to accelerate the conversion of Uttarakhand's substantial research output into commercially protected and exploited intellectual property.

Geographical indication registration carries particular relevance for Uttarakhand given the state's distinctive agricultural and horticultural products discussed in Chapter 18, including specific hill grown fruit varieties, traditional medicinal plants, and handicraft traditions connected to the state's cultural heritage discussed in Chapter 19, none of which currently benefit from the kind of systematic geographical indication protection that would allow local producers to command premium pricing and prevent imitation products from outside the state trading on the reputation of genuinely Uttarakhand origin goods. Extending dedicated support for geographical indication registration specifically, alongside the more conventional patent and trademark support that established research institutions such as the Forest Research Institute already provide internally, represents an important, currently underdeveloped priority for the state's intellectual property strategy.

The commercialisation gap this section has identified, between genuine research output and its conversion into protected, market ready intellectual property, is compounded by the limited presence of dedicated intellectual property law and technology transfer expertise within Uttarakhand itself, meaning that researchers and small enterprises seeking to protect and commercialise genuinely novel forestry, wildlife management, or agricultural innovations frequently must engage intellectual property counsel based in Delhi or other larger cities, adding cost and logistical friction to a process that a more locally embedded intellectual property support ecosystem could streamline considerably. Building this local technology transfer and intellectual property counsel capacity, potentially through a dedicated state-level intellectual property facilitation cell working in coordination with the state's major research institutions discussed throughout this chapter, represents a concrete, actionable step the state's Department of Science and Technology could pursue to close this gap.

Traditional knowledge protection represents a further, particularly sensitive dimension of Uttarakhand's intellectual property landscape, given the state's rich tradition of indigenous ecological and medicinal knowledge held within its Garhwali, Kumaoni, Bhotia, and Van Gujjar communities discussed in Chapter 1, spanning traditional medicinal plant use, sustainable forest management practices, and pastoral knowledge accumulated over generations. Without deliberate protective measures, this traditional knowledge remains vulnerable to external commercial appropriation without benefit sharing returning to the originating communities, a pattern documented in various forms across India's biodiversity rich regions. Extending India's existing biodiversity and traditional knowledge protection frameworks, administered nationally through the National Biodiversity Authority, with genuine local implementation capacity within Uttarakhand specifically, would help ensure that if and when this traditional ecological knowledge is commercialised, whether in pharmaceutical, cosmetic, or agricultural product development, the originating hill communities themselves receive a fair share of the resulting commercial benefit rather than seeing their inherited knowledge extracted without corresponding return.

17.4 Knowledge Institutions as Engines of Development

Uttarakhand's knowledge institution base, spanning the Indian Institute of Technology Roorkee and Govind Ballabh Pant University of Agriculture and Technology discussed in Chapter 5, alongside the Forest Research Institute, Wildlife Institute of India, and Indian Institute of Petroleum discussed in section 17.2, together constitute a research and higher education density that few Indian states of comparable population possess. The Indian Institute of Management Kashipur further extends this knowledge institution base into management education and, through its Foundation for Innovation and Entrepreneurship Development incubation centre, into agri-technology entrepreneurship support specifically, operating across a 20,000 square foot facility and channelling projects funded by the central Ministry of Agriculture and Farmers' Welfare toward supporting the state's agri-entrepreneurship ecosystem, alongside extending its work into tourism, education, and sustainable technology domains (FIED, IIM Kashipur, 2026).

This deliberate agricultural technology focus within the Indian Institute of Management Kashipur's incubation activity reflects a broader, sensible pattern across Uttarakhand's knowledge institution ecosystem discussed throughout this chapter, in which the state's premier institutions have oriented at least a portion of their innovation and entrepreneurship support activity toward sectors genuinely relevant to the state's own economic base, agriculture, forestry, and increasingly tourism, rather than defaulting entirely to the generic information technology and consumer internet startup focus that dominates incubation activity in many of India's larger metropolitan innovation hubs. This alignment between institutional research focus and state economic structure, discussed throughout Chapters 3, 4, and 18, represents a genuine strength of Uttarakhand's knowledge economy positioning, even as the state's overall innovation ecosystem remains smaller in absolute scale than those of India's largest states.

The Foundation for Innovation and Entrepreneurship Development's role as an implementing channel for the national Startup India Seed Fund Scheme, discussed in its own public communications regarding the scheme's 15 May 2026 application closure deadline, illustrates a further important function these knowledge institutions perform beyond research and incubation alone, serving as trusted, locally embedded intermediary institutions through which national government funding schemes can reach Uttarakhand's early stage entrepreneurs more effectively than a purely centralised, Delhi administered scheme could achieve on its own. This intermediary function, connecting national funding architecture to local entrepreneurial talent, represents an important and somewhat underappreciated dimension of how knowledge institutions in a state such as Uttarakhand can meaningfully extend the reach of national innovation policy instruments beyond what those instruments could achieve if administered without any local institutional presence at all.

The concentration of these knowledge institutions specifically within and around Dehradun, rather than distributed more evenly across the state's Garhwal and Kumaon hill districts, mirrors the broader hill-plains disparity documented throughout this framework, discussed extensively in Chapters 1, 5, and 12, meaning that the economic development benefits these

institutions generate, through direct employment, associated business services demand, and knowledge spillover effects, accrue disproportionately to Dehradun and its immediate surrounding area rather than to the state's more remote hill districts where economic development need, discussed throughout this framework, is often greatest. Extending satellite research and incubation facilities connected to these Dehradun anchored institutions into secondary hill towns, potentially including Srinagar, Almora, or Pithoragarh, represents an underexplored opportunity to distribute the knowledge economy benefits these institutions generate more broadly across the state's geography.

Such satellite facilities need not replicate the full scale of their Dehradun parent institutions to generate meaningful local benefit; even a modest field research station or seasonal extension office, staffed periodically by researchers from the parent institution and offering local farmers, foresters, and small entrepreneurs direct access to expertise and equipment that would otherwise require a costly and time-consuming journey to Dehradun, could meaningfully improve the practical reach of the state's knowledge institution base into the hill districts where, as this framework has documented throughout, the need for exactly this kind of technical support and innovation access is often most acute. The Uttarakhand Space Application Centre's own geospatial monitoring work, discussed in Chapter 16, already demonstrates a model of centrally coordinated but locally relevant technical service delivery that other Dehradun anchored institutions could potentially adapt for their own hill district outreach.

17.5 Building a Youth Innovation and Research Ecosystem

Youth innovation engagement within Uttarakhand's ecosystem operates substantially through the state's university based incubators discussed in section 17.1, including the University of Petroleum and Energy Studies' Centre for Innovation and Entrepreneurship and the Indian Institute of Management Kashipur's Foundation for Innovation and Entrepreneurship Development, both of which provide structured pathways for students to develop entrepreneurial ideas into genuine startup ventures during and immediately following their formal education. The State Innovation Challenge format, discussed in the broader state facilitation context of section 17.1 through the Startup Grand Challenge initiative, extends this youth innovation engagement beyond university campus boundaries to a wider pool of young innovators across the state, offering a competitive format intended to surface promising ideas that might not otherwise access university incubator infrastructure directly.

Given the state's distinctive demographic profile discussed in Chapter 1, characterised by a narrower demographic dividend window than several larger Indian states owing to Uttarakhand's earlier fertility transition, and the persistent youth outmigration pressures discussed extensively in Chapter 12, building a genuinely engaging youth innovation ecosystem carries particular urgency for the state, since successfully cultivating local entrepreneurial opportunity represents one of the few policy levers directly capable of offering the state's young people a compelling reason to build their careers within Uttarakhand rather than relocating to Delhi, Bengaluru, or other larger innovation hubs

elsewhere in India, a dynamic this framework has emphasised throughout its rural development and education chapters.

This urgency is compounded by a specific pattern worth naming explicitly: the same young people whose technical education, discussed in Chapter 5, has been substantially subsidised through the state's public education and higher education investment are precisely those with the greatest mobility and market value once qualified, meaning that a state which successfully educates its youth but fails to retain them through compelling local entrepreneurial and employment opportunity effectively subsidises the human capital base of Delhi, Bengaluru, and other destination cities rather than its own economy, a dynamic this framework has termed the sequencing challenge in the education context of Chapter 5 and which recurs here in the specific context of youth innovation retention.

The specific sectoral orientation of Uttarakhand's youth innovation ecosystem toward agri-technology, forestry, and tourism related innovation, discussed throughout this chapter, offers a genuinely distinctive value proposition for young innovators specifically interested in applying their technical and entrepreneurial skills to problems directly connected to their home state's landscape and communities, rather than pursuing more generic technology startup concepts disconnected from Uttarakhand's particular geography and economy. Strengthening this place-based innovation identity, potentially through dedicated youth innovation challenges specifically focused on hill agriculture, disaster resilience technology, and sustainable pilgrimage tourism management, discussed throughout Chapters 12, 14, and 19, would further differentiate Uttarakhand's youth innovation ecosystem from the more generic startup culture prevalent elsewhere, offering young Uttarakhand innovators a genuinely distinctive and locally meaningful entrepreneurial identity.

Alumni and diaspora engagement represents a further, currently underdeveloped channel for strengthening Uttarakhand's youth innovation ecosystem, given the substantial population of Uttarakhand origin professionals now working in Delhi, Bengaluru, Mumbai, and internationally, many of whom departed the state precisely because of the limited local entrepreneurial and employment opportunity discussed throughout this chapter, yet who often retain genuine emotional and family connection to their home districts. Structured mentorship and angel investment programmes specifically connecting this diaspora population back to Uttarakhand's youth innovation ecosystem, potentially organised through alumni networks of the state's own higher education institutions discussed in Chapter 5, could meaningfully expand the mentorship capacity and investment capital available to young Uttarakhand innovators without requiring these diaspora professionals to physically relocate back to the state, offering a lower barrier form of continued economic engagement than full return migration would require.

17.6 Skill Development, Employability and Workforce Alignment

Skill development within Uttarakhand's innovation and knowledge economy strategy must contend with the specific workforce composition challenges discussed throughout this framework, particularly the selective outmigration of working age men from the state's hill

districts documented in Chapter 12, which leaves the innovation and entrepreneurship talent pool within many hill communities skewed toward women, older residents, and younger people who have not yet migrated, a demographic reality that skill development and employability programming should explicitly account for rather than assume a conventional, gender and age balanced workforce profile of the kind more typical of India's plains states.

Aligning the state's polytechnic and vocational training infrastructure, discussed in the education context of Chapter 5, with the specific sectoral orientation of Uttarakhand's innovation ecosystem toward agri-technology, forestry science, and tourism management, discussed throughout this chapter, represents an important workforce alignment priority, ensuring that graduates of the state's technical and vocational training institutions possess skills genuinely relevant to the entrepreneurial and research opportunities the state's knowledge institutions and incubators are working to generate, rather than training a workforce oriented toward generic information technology or manufacturing skills better suited to employment markets in Delhi, Bengaluru, or Pune than to opportunities available within Uttarakhand itself.

Given the substantial pharmaceutical manufacturing employment base concentrated in Haridwar and Udham Singh Nagar, discussed in Chapter 4, and the pharmaceutical and life sciences research capability embedded within institutions including the Indian Institute of Petroleum and the state's broader higher education base discussed in Chapter 5, strengthening formal workforce pathways connecting the state's science and technology graduates directly to this pharmaceutical manufacturing base represents a further concrete workforce alignment opportunity, one that would allow Uttarakhand to capture more of the employment value its own knowledge institutions generate rather than seeing graduates migrate toward pharmaceutical and life sciences employment opportunities in other states' more established manufacturing clusters.

Digital and remote work skill development represents a further, increasingly relevant workforce alignment opportunity specifically suited to Uttarakhand's dispersed hill population, discussed throughout this framework, since remote and freelance digital work, spanning software development, content creation, and increasingly artificial intelligence data annotation and training work connected to the state's own AI Mission discussed in Chapter 16, offers hill residents a genuine pathway to participate in India's broader digital economy without requiring physical relocation to Delhi, Bengaluru, or other conventional employment destinations. Structured digital skill training programmes specifically targeting hill district youth and, given the demographic patterns discussed in Chapter 12, the women who disproportionately remain in hill villages after male family members migrate, could meaningfully expand the range of viable livelihood options available within the hill districts themselves, complementing rather than replacing the agri-technology and tourism focused skill development priorities discussed throughout this chapter.

A further, genuinely distinctive workforce alignment opportunity specific to Uttarakhand concerns the professional guiding, mountaineering, and adventure tourism training discussed in the vocational education context of Chapter 5, since the Nehru Institute of

Mountaineering's certification pathway represents exactly the kind of place-specific, internationally recognised technical credential that could anchor a genuinely export-oriented skill development strategy, training not only Uttarakhand's own residents but potentially adventure tourism professionals from across the Himalayan region and internationally, generating both direct training revenue and an enhanced reputation for the state as a genuine centre of excellence in mountain based technical training, extending well beyond the state's borders in a manner analogous to the Forest Research Institute's national policy influence discussed in section 17.2.

Chapter 18: Agriculture, Allied Sectors and Food Security

Agriculture in Uttarakhand is really two distinct agricultural economies operating under one state government: an irrigated, input-intensive plains agriculture in the Terai and Bhabar belt of Udham Singh Nagar and Haridwar, cultivated much like neighbouring western Uttar Pradesh, and a fragmented, rainfed, terrace-farmed hill agriculture across the remaining eleven districts, where landholding size, market access and even the crops that can physically be grown are dictated by altitude and slope rather than by farmer choice. This chapter examines cropping patterns and input use, irrigation and water-use efficiency in agriculture specifically, agricultural marketing and farmer income, food processing and value chain development, animal husbandry and dairy, fisheries, horticulture and medicinal plants, and agricultural credit and insurance in turn, a sequence that traces the state's food and farm economy from field to market to the risk-management architecture meant to cushion both.

18.1 Cropping Pattern, Agricultural Productivity and Input Use

Uttarakhand's agriculture is diverse, with wheat grown in Tarai and valley regions with irrigation facilities, rice cultivated in Udham Singh Nagar and Haridwar under favourable conditions, and maize popular in mid-altitude areas where irrigation is limited (Just Agriculture, 2025). In the Terai and Bhabar regions, staple cereals like rice and wheat are extensively cultivated with irrigation, and maize is a significant crop in these lower elevations; in the mid-hills, rainfed agriculture becomes more prevalent, with finger millet and barnyard millet dominant due to their resilience, alongside local bean and lentil varieties and potatoes grown in rotation. In the high-altitude zones of Uttarkashi and parts of Chamoli and Pithoragarh, cultivation is limited by short growing seasons, with buckwheat (kuttu) a key crop alongside indigenous millets and hardy pulses, and these areas increasingly important for medicinal and aromatic plants (Uttarakhand PCS Exam Notes, 2025). High-altitude areas support crops like apples, walnuts and plums, while lower subtropical regions suit wheat, paddy, sugarcane and pulses (Just Agriculture, 2025).

The state has 0.3 million hectares under rice cultivation covering irrigated and rainfed hill rice areas, with current state average productivity of about 2 tonnes per hectare, constrained by unsustainable intensive rice-wheat production systems in Tarai areas, decreasing organic carbon content in soils, imbalanced fertilizer use, and biotic stresses including bacterial leaf blight and stem borer in the Tarai and blast in hill areas (ICAR, n.d.). Chamoli in the Garhwal hills and Pithoragarh in the Kumaun hills are the districts where cropping patterns are most specialised for foodgrain crops and productivity is at the lowest level, with low concentration of important crops and little diversity, making these two districts among the least productive areas (ScienceDirect, 2003). Suggested interventions include zero tillage in wheat in the Tarai region on 0.5 million hectares to produce an additional 1.2 million tonnes (ICAR, n.d.), illustrating that meaningful productivity gains remain available in the plains portion of the state's agriculture even without addressing the more structurally difficult hill productivity gap.

Input use patterns further illustrate the plains-hill divide running through this chapter. Fertiliser and irrigation-dependent input packages developed for the Green Revolution-era rice-wheat system remain calibrated to Terai plains conditions, where soil type, field size and assured water supply make balanced fertiliser application both technically straightforward and economically justified given the returns a farmer can expect. In the hill districts, by contrast, the same input packages are frequently applied to soils and slopes for which they were never designed, a mismatch that helps explain why imbalanced fertiliser use appears repeatedly in the agricultural research literature as a constraint on hill productivity specifically, even as fertiliser subsidy policy nationally continues to be designed around the assumption of the plains cropping system. Seed replacement rates, the share of farmers each season using certified rather than farm-saved seed, also tend to run lower in the hill districts than in the Terai, reflecting both the weaker last-mile input distribution network in dispersed hill settlements and the lower cash-crop orientation of subsistence-focused hill farming, a pattern this framework's Chapter 4 discussion of hill-district market access constraints for industrial investment mirrors closely for agricultural input access specifically. Extension service delivery, the agricultural equivalent of the specialist-staffing gaps this framework has documented for health services in Chapter 6.1 and judicial services in Chapter 15.3, faces a comparable last-mile problem: the ratio of trained agricultural extension officers to farming households declines sharply moving from the Terai into the mid- and high-hill districts, leaving exactly the farmers most in need of tailored, terrain-specific cultivation advice with the least consistent access to it.

18.2 Irrigation and Water Use Efficiency in Agriculture

Chapter 10.2 of this framework examined Uttarakhand's irrigation infrastructure in detail, its 45 percent net-irrigated to net-sown area ratio, its near-total reliance on minor irrigation schemes and gravity-fed hill channels known as guls in the absence of large canal systems, and the specific tail-reach water-distribution inefficiencies documented in the Upper Ganga Canal command area study of the Gadarjudda minor canal in Roorkee, Haridwar district. This section focuses more narrowly on what those infrastructure constraints mean for on-farm water-use efficiency and the state's uptake of micro-irrigation technology specifically.

The Gadarjudda command area study found that most farmers were literate and open to adopting micro-irrigation technology, though the majority are marginal or small-scale with limited financial capacity (ICID-CIID, 2025), meaning awareness and willingness alone have not been sufficient to drive adoption. This finding likely generalises beyond the specific canal command studied: Uttarakhand's average landholding size, fragmented further by hill terrain and inheritance-driven subdivision, makes the fixed cost of drip or sprinkler infrastructure proportionally heavier for the state's farmers than for a large-holding Punjab or Haryana farmer installing the same system, even where the Union government's Per Drop More Crop micro-irrigation component of the Pradhan Mantri Krishi Sinchai Yojana offers capital subsidy support nationally.

Horticultural crops, apples, walnuts, citrus and vegetables, are where micro-irrigation adoption would plausibly deliver the largest water-use efficiency gains in Uttarakhand specifically, since these higher-value crops can better absorb the residual cost micro-irrigation subsidies do not cover, and since horticulture is concentrated in precisely the mid- and high-altitude zones where irrigation water is scarcest and most dependent on the same spring and stream sources whose depletion this framework documented in Chapter 10.1. A disaggregated, current count of micro-irrigation coverage specific to Uttarakhand's horticultural area could not be confirmed from the sources available for this chapter, a gap this framework flags for direct follow-up against the state horticulture department's own scheme implementation data.

Rainfall variability compounds the water-use efficiency challenge in ways that pre-date and will likely outlast any single irrigation scheme's rollout timeline. Hill agriculture across Uttarakhand remains predominantly rainfed even where irrigation infrastructure of some kind exists, meaning the timing and distribution of monsoon rainfall, rather than assured canal or tubewell supply, continues to determine actual crop water availability for the majority of the state's cultivated hill area. Climate models incorporated into research on the Upper Ganga Canal command area forecast significant increases in temperature and rainfall variability that will escalate crop water requirements from 2000 to 2050 (Springer Nature, 2021), a trend that would widen the gap between water demand and available supply in exactly the tail-reach, resource-constrained farming contexts this section has identified as least able to absorb the cost of adaptive infrastructure without dedicated public investment. This climate dimension of agricultural water-use efficiency connects directly to the state's broader climate vulnerability profile examined in Chapter 14.

18.3 Agricultural Marketing, Price Realisation and Farmer Income

In 2019, only 4.19 percent of Uttarakhand's wheat was procured publicly through the price support system in APMC mandi yards, compared with 70.9 percent of Punjab's wheat procured the same way, reflecting the strength of public procurement through APMC mandis in Punjab in ensuring MSP is paid to farmers, and the weakness of such procurement in Uttarakhand due to poor APMC structures opening the gates for private traders to exploit farmers (Singh & Bhogal, 2021). Since Minimum Support Price only provides an effective income floor where a functioning procurement mechanism exists to enforce it, this near-total absence of public procurement infrastructure means Uttarakhand's wheat and rice farmers realise prices set predominantly by private trader bargaining power rather than by the MSP the Union government announces each season, a structural disadvantage no policy announcement about MSP levels alone can correct.

The National Agriculture Market platform, e-NAM, launched on 14 April 2016, had integrated 1,389 mandis across 23 states and four Union Territories by February 2024, with over 1.77 crore farmers and 2.53 lakh traders registered on it (Agriculture Institute, n.d.). A Uttarakhand-specific count of e-NAM-integrated mandis and their trading volumes could not be confirmed from the sources consulted for this chapter, an evidentiary gap that matters

given how directly e-NAM's promise, access to buyers beyond the local mandi and more transparent price discovery, speaks to exactly the private-trader-dominated marketing structure the wheat procurement figures above describe. Given the poor underlying APMC infrastructure documented above, meaningful e-NAM benefit for Uttarakhand's farmers would likely depend on the state first building out the physical mandi network e-NAM is designed to digitise and connect, rather than digitisation alone compensating for the infrastructure gap.

Farmer income realisation in Uttarakhand is also shaped by the same terrain-driven logistics cost this framework has documented for other sectors: hill farmers face materially higher transport costs per quintal getting produce down to the nearest mandi or processing point than plains farmers do, a cost that falls disproportionately on the state's horticultural and vegetable growers whose perishable produce cannot absorb long transit delays the way stored grain can, reinforcing the case for the value-addition and local processing infrastructure examined in the next section as a more terrain-appropriate income strategy than expanded grain procurement alone.

Farmer Producer Organisations, aggregating small and marginal hill farmers into collective bargaining units for input purchase, produce sale and, in some cases, joint processing, represent the marketing reform path most frequently proposed as a substitute for the APMC infrastructure Uttarakhand's hill districts are unlikely to ever build out to plains-district density given the underlying terrain and settlement dispersion. Government promotion of FPOs has proceeded nationally through the Ten Thousand FPOs scheme launched in 2020, with matching funding and handholding support agencies designated to assist FPO formation and initial operation, but a Uttarakhand-specific count of registered and functionally active FPOs, as distinct from those formally incorporated but not yet conducting meaningful aggregated trade, could not be confirmed from the sources available for this chapter.

18.4 Food Processing Industry and Value Chain Development

Uttarakhand's food processing capacity is anchored by two Mega Food Parks operating under the central government's food processing infrastructure scheme, both located in the state's plains districts where raw material aggregation and industrial logistics are most feasible. The Patanjali Food and Herbal Park in Haridwar generated employment for over 16,000 people through large-scale food and herbal processing activities (Vajiram and Ravi, 2026), reflecting the same Haridwar FMCG cluster this framework profiled in Chapter 4.3. The Himalayan Mega Food Park at Mahuakhera Ganj in Kashipur, Udham Singh Nagar district, was set up at a cost of Rs 99.96 crore across 50.14 acres, has a central processing centre and three Primary Processing Centres at Ram Nagar, Ramgarh and Kaladungi, and will benefit around 25,000 farmers in the district and neighbouring districts of Nainital, Garhwal, Almora and Champawat (GKToday, 2018). Facilities at the central processing centre include a multi-purpose cold storage of 1,250 MT, a dry warehouse of 6,000 MT, and an aseptic brick filling line, with the park expected to generate a turnover of about Rs 450-500 crore annually

(PIB, 2018), and it has generated employment for around 16,040 people (Vajiram and Ravi, 2026).

The explicit design logic connecting these two parks, backward linkages reaching toward hill-district farmers through primary processing centres feeding into a plains-based central processing facility, represents the most concrete existing mechanism for capturing value-addition income in the hill districts identified as needing exactly this kind of terrain-appropriate income strategy in section 18.3 above. Whether the parks' primary processing centres have achieved the farmer reach and utilisation their original design intended, as distinct from their headline investment and direct-employment figures, could not be verified from current, disaggregated sources for this chapter, a gap consistent with the pattern this framework has documented repeatedly of headline infrastructure figures outpacing verified utilisation data.

Both Mega Food Parks, however, sit in the state's plains districts, meaning the Primary Processing Centres, while closer to farm gate than the central processing facility itself, still require produce from the higher, more remote hill districts to travel a considerable distance before reaching even this first processing point. Cold chain infrastructure, refrigerated transport and pack-houses positioned genuinely within the hill districts themselves rather than at their foothill margins, remains comparatively underdeveloped relative to the scale of horticultural production the state's high-altitude districts generate, a gap that limits how much of the value addition these Mega Food Park investments were designed to capture actually accrues to hill farmers as opposed to plains-based aggregators and transporters who currently bridge that final, most difficult stretch of the supply chain. The state's broader food processing policy architecture, including the Pradhan Mantri Kisan Sampada Yojana's cluster-based approach to strengthening forward and backward linkages from farm to market, provides the national funding scaffold within which any expansion of this processing capacity would need to be pursued.

18.5 Animal Husbandry, Dairy and Poultry: Economic Contribution

Animal husbandry occupies a distinctive role in Uttarakhand's hill economy that national aggregate livestock statistics do not fully capture: in a terrain where landholding fragmentation limits crop-based income and where a meaningful share of the working-age population has migrated out for employment, livestock, particularly a small number of milch cattle or buffalo kept by the household members remaining behind, functions as much as a livelihood-diversification and risk-buffering asset as a commercial dairy enterprise in the way the term is typically used in India's major milk-producing plains states. The Basic Animal Husbandry Statistics 2025 confirm India ranks first globally in milk production with an output of 247.87 million tonnes in 2024-25, marking 3.58 percent growth, with Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra together accounting for 54.09 percent of national milk output (Testbook, 2026), a concentration pattern that by definition places Uttarakhand's own milk production well outside the major contributing states. A current, disaggregated Uttarakhand-specific milk production figure could not be confirmed from the

sources available for this chapter, a data gap this framework flags for direct follow-up against the state's own Animal Husbandry Department reporting or the 21st Livestock Census, launched on 25 October 2024, under which data on livestock and poultry is being collected in all States/UTs (Ministry of Fisheries, Animal Husbandry and Dairying, 2024).

The Animal Husbandry Infrastructure Development Fund, into which the Dairy Infrastructure Development Fund has been subsumed with a revised outlay of Rs 29,610 crore, was modified on 1 February 2024 to include Dairy Cooperatives as eligible beneficiaries, and had leveraged Rs 13,306.50 crore of investment in 486 approved projects (Ministry of Fisheries, Animal Husbandry and Dairying, 2024), representing the principal financing channel through which Uttarakhand's own dairy cooperative structure could expand processing capacity, though a Uttarakhand-specific project count or investment figure under this fund could not be confirmed from the sources consulted here. Poultry meat dominates national meat output, with West Bengal, Uttar Pradesh, Maharashtra, Andhra Pradesh and Telangana together accounting for 57.55 percent (Testbook, 2026), and no evidence available for this chapter suggests Uttarakhand plays a comparable role in either commercial poultry meat or egg production.

Cooperative dairy structures, organised on the Anand pattern of village-level milk collection societies federated upward into district unions and a state-level milk federation, provide the institutional channel through which the state's dispersed, small-herd hill dairy households would in principle access processing, transport and price-stabilisation support comparable to what larger dairy states' cooperative federations provide their own farmers. The functional strength of this cooperative structure in Uttarakhand specifically could not be verified with current data from the sources available for this chapter, a gap that matters because a weak cooperative structure would leave hill households using livestock as a livelihood-diversification asset without the aggregation and processing support that could help convert that asset into a more substantial and stable cash income stream. Strengthening this evidentiary base is a priority this framework flags for the statistical strengthening agenda addressed further in Chapter 20.6.

18.6 Fisheries: Inland, Marine and Aquaculture

Fisheries in Uttarakhand, a landlocked state with no marine component whatsoever, divide into cold-water fisheries in the hill districts and fresh-water fisheries, principally carp and pangasius, in the plains, with trout the main fish under cold-water fisheries, perfect for rearing at altitudes above 4,000 feet, proving to be an excellent source of income generation in remote areas (Uttarakhand Cooperative Department, n.d.). Uttarakhand recorded around 710 MT trout production and total fish production of 10,486 MT during 2024-25, supported by nearly 2,500 raceways across districts such as Pithoragarh, Bageshwar and Chamoli (IANS, 2026). This places Uttarakhand among cold-water fishery states, alongside Jammu & Kashmir, Ladakh, Himachal Pradesh, Arunachal Pradesh, Sikkim, Meghalaya and Nagaland, whose ecosystems span more than 5.33 lakh square kilometres of mountainous terrain, contributing to cold-water fisheries' near-3-percent share of India's inland fish production, out

of a total national fish production of approximately 197.75 lakh tonnes in 2024-25 (IANS, 2026).

The Department of Fisheries Uttarakhand reports a total stream length of 2,686 km, of which 725 km is suitable for food and game fishes, and has taken initiative for conservation and propagation of trout and mahseer through an angling programme in which beats are allocated to local cooperatives or groups authorised to issue angling permits to tourists while also working for conservation, especially during banned fishing periods (Department of Fisheries, Uttarakhand, n.d.). Because trout raceways require abundant, small parcels of land and continuous cold water flow, the same physical constraints limiting large-scale hill agriculture and irrigation infrastructure documented in sections 18.1 and 18.2 above also cap how far trout aquaculture can scale within any single hill location, a limitation the State Integrated Cooperative Development Project has sought to address by connecting individual small raceway operators given the mountainous geographical conditions, limited land availability and limited water supply that prevent building more raceways at one place (Uttarakhand Cooperative Department, n.d.).

Comparing this against Himachal Pradesh, which produced around 1,673 metric tonnes of trout in 2025-26 supported by 909 farmers and 1,739 trout farming units (OpenGov Asia, 2026), suggests Uttarakhand's cold-water aquaculture sector, despite operating a broadly comparable raceway count, has room to grow toward its neighbouring hill state's per-unit productivity and farmer participation levels, though differences in raceway design, water temperature regimes and market access make a precise comparison difficult without more granular data. Nationally, trout production has increased nearly 1.8 times over the last decade to about 6,000 metric tonnes in 2024-25, and across cold-water states, 23.51 lakh families have received livelihood support while 33.78 lakh fishers have been covered under insurance schemes (IANS, 2026), indicating a sector the Union government is actively working to scale.

18.7 Horticulture, Floriculture and Medicinal Plants

Horticulture, and medicinal and aromatic plant cultivation specifically, represents Uttarakhand's most distinctive comparative advantage within Indian agriculture. The Indian Himalayan region supports about 18,440 species of plants, of which about 45 percent have medicinal properties, and according to Samant et al., 1,748 species specifically are medicinal (Uttarakhand Forest Department, n.d.). The number of farmers engaged in cultivation of aromatic plants in Uttarakhand increased dramatically from 301 in 2003-04 to 2,714 in 2006-2007, with the area under aromatic plants increasing tenfold (Uttarakhand Forest Department, n.d.), an early growth trajectory that subsequent state and central policy support, through the National Medicinal Plants Board and the corresponding State Medicinal Plant Board, has aimed to sustain.

The Institute of Medicinal and Aromatic Plants at Gairsain, under the VCSG Uttarakhand University of Horticulture and Forestry, works on collection and multiplication of germplasm, quality planting material for local farmers, and drug evaluation and formulation,

alongside a demonstration farm of semi-high-density apple orchard and walnut plantation at Hargarh farm (VCSG Uttarakhand University of Horticulture and Forestry, n.d.). Research on medicinal plant cultivation in Chamoli district has focused on high-value species such as *Picrorhiza kurroa* and *Saussurea costus*, where continued unsustainable collection and increasing market demand have pushed numerous species toward extinction, with recommendations including promoting plantation of these species on private land and in Van Panchayat community forest land, and developing herbal gardens at schools as germplasm repositories (ResearchGate, n.d.).

This tension between conservation and commercial exploitation is compounded by market structure weaknesses similar to those documented for staple crop marketing in section 18.3: high risks, transaction costs and lack of trust among chain participants prevent producers from taking up cultivation of medicinal plants, a gap the NGO ANKUR played a key role in addressing by coordinating and mobilising government departments and other institutions in Chamoli district to help farmers link up with reliable markets (ResearchGate, n.d.), illustrating that market-linkage intervention, not just cultivation technique or planting material availability, remains a binding constraint on how far this sector can convert Uttarakhand's biodiversity advantage into durable farmer income.

Floriculture occupies a smaller, less-documented place within this same high-value horticulture category. Cut flowers and ornamental plants grown in the state's mid-hill valleys benefit from cooler growing conditions that extend shelf life relative to plains-grown flowers destined for the same National Capital Region floriculture markets, a comparative advantage similar in kind to the one this framework has already documented for hill-grown apples and medicinal plants, though current, disaggregated area and production statistics specific to Uttarakhand's floriculture sector could not be confirmed from the sources consulted for this chapter.

18.8 Agricultural Credit, Insurance and Risk Management

Agricultural risk management in Uttarakhand runs through the same national architecture as the rest of India. The Union Cabinet approved continuation of the Pradhan Mantri Fasal Bima Yojana and Restructured Weather Based Crop Insurance Scheme till 2025-26 with an overall outlay increased to Rs 69,515.71 crore, with 88 percent of insured farmers being small and marginal farmers and 57 percent from OBC, SC and ST categories (News on Air, 2025). Several PMFBY design changes introduced from Kharif 2025 onward carry particular relevance for a forest-adjacent hill state like Uttarakhand: a new Wild Animal Attack add-on cover is a long-demanded benefit for farmers in forest-adjacent areas across Jharkhand, Odisha, Chhattisgarh, Uttarakhand and North-East India, while an ESCROW account has been made mandatory from Kharif 2025, requiring all state governments to deposit their premium share in advance before the crop season (Agrijob, 2026), intended to reduce claim payment delays that have historically undermined farmer trust in the scheme.

A Uttarakhand-specific PMFBY enrolment count, claims payout figure, or Kisan Credit Card penetration rate could not be confirmed from the sources available for this chapter, an

evidentiary gap of some consequence given how directly these figures would indicate whether the state's predominantly small and marginal hill farmers are actually accessing this national risk-management architecture at a rate comparable to farmers in the major agricultural states. Non-loanee farmers' voluntary coverage has increased to 55 percent of total coverage under the scheme during 2023-24 (PIB, 2025), which means the state's own Kisan Credit Card penetration rate is a leading indicator of likely crop insurance coverage that this framework recommends the state Agriculture Department track and publish at district level, distinguishing hill from plains districts.

Credit access more broadly faces a further structural constraint specific to hill agriculture: formal lending, whether through Kisan Credit Cards or term loans for horticultural or fisheries investment, typically requires clear land title as collateral, yet a meaningful share of cultivated hill land in Uttarakhand is held under customary or fragmented ownership arrangements that complicate the formal title documentation banks require, a friction that affects the same trout raceway operators, medicinal plant cultivators and horticultural growers this chapter has profiled as needing exactly the kind of capital investment formal credit is meant to enable. Group lending models and joint liability groups have been used to partially address this constraint elsewhere in hill and tribal India, though a Uttarakhand-specific assessment of how widely such models have been deployed could not be confirmed from this chapter's sources.

Taken together, this chapter's eight sections describe an agricultural economy whose most serious constraints are less about what can physically be grown, the state's biodiversity and agro-climatic range are, if anything, its greatest comparative advantage, than about the market, credit, processing and insurance infrastructure needed to convert that physical production into stable farmer income. The pattern recurs across nearly every section: strong underlying resource potential paired with documented or plausible gaps in market access, price realisation, credit penetration or verified scheme utilisation. Closing these gaps, rather than further expanding the physical footprint of any single crop or livestock category, is likely to matter more for hill farmer income over the coming decade than any single new agricultural scheme this framework has reviewed.

Chapter 19: Tourism, Culture and Creative Economy

Tourism is Uttarakhand's most visible economic identity and, as the preceding chapters of this framework have repeatedly shown, its most consequential source of environmental, infrastructural and social strain. A state receiving more than twenty crore visitor trips across three years, discussed in section 19.3, is by definition a state whose tourism sector interacts directly with the forest fire and pollution pressures documented in Chapter 13, the disaster preparedness and Yatra season logistics documented in Chapter 14, and the road and rail connectivity questions documented in Chapter 8, meaning this chapter cannot be read in isolation from the rest of this framework any more than the sector itself can be managed in isolation from the state's other governance priorities. This chapter examines the sector directly across six dimensions, the state's inventory of natural, heritage, religious and adventure tourism assets, the infrastructure connecting and housing visitors, the scale and trajectory of tourist flows, the institutional framework protecting cultural heritage, the creative industries built around traditional craft and performance, and finally the film and media sector that has quietly become one of the state's most distinctive economic drivers.

19.1 Tourism Asset Inventory, Natural, Heritage, Religious and Adventure

Uttarakhand's tourism identity rests overwhelmingly on religious pilgrimage, anchored by the Char Dham Yatra circuit of Badrinath, Kedarnath, Gangotri and Yamunotri, which this framework's Chapters 13 and 14 have already examined from a waste management and disaster risk perspective respectively. Each of the four shrines operates on a strict seasonal calendar dictated by Himalayan snowfall, opening only after winter snow has cleared from the high passes each spring and closing again before the following winter, a rhythm that concentrates the overwhelming majority of the state's highest value pilgrimage tourism into a roughly six month window and that this framework's Chapter 13 discussion of Yatra season waste and Chapter 14 discussion of seasonal disaster preparedness both treat as a defining operational constraint rather than a minor scheduling detail. Alongside this core circuit, the state has been actively expanding its pilgrimage portfolio, the Adikailash Yatra in Pithoragarh has emerged as a newer offering intended to spread pilgrim flows beyond the peak Char Dham season and extend tourism revenue across a longer part of the year (Travel And Tour World, 2025). Haridwar and Rishikesh, the twin gateway towns at the edge of the Himalaya, add a second religious tier built around the Ganga itself, hosting the periodic Kumbh Mela, understood as one of the world's largest peaceful human congregations, alongside the annual Ganga Dussehra festival marking the river's mythological descent to earth, celebrated each May or June with lamp lit ghats and riverside prayer (Ministry of Culture, n.d.; Mero Uttarakhand, 2026). Rishikesh in particular has built a distinct secondary identity as a global yoga and wellness destination layered on top of its pilgrimage function, a positioning anchored by the annual International Yoga Festival, held on the banks of the Ganga and drawing participants from more than eighty countries in its larger recent editions, a scale of international footfall that broadens Rishikesh's visitor base well beyond religious tourism alone and gives the town a distinct international profile that the rest of the state's tourism circuit does not share to the same degree (Utsav.gov.in, n.d.).

Beyond religion, the state's hill stations, Nainital, Mussoorie and the ski resort of Auli among them, and its adventure tourism assets, white water rafting on the Ganga at Rishikesh, trekking routes through Valley of Flowers National Park discussed in Chapter 13, and skiing at Auli, form a second major pillar of the tourism asset base, one the state's own marketing increasingly packages alongside its religious circuit rather than as a separate offering (IBEF, 2025). Mussoorie's colonial era hill station architecture and Nainital's lake centred landscape give the state's adventure and leisure tourism a visual identity distinct from its religious sites, and both towns function as gateway destinations that convert casual leisure visitors, who might never undertake a Char Dham pilgrimage, into repeat visitors to the state more broadly, a diversification that matters given the seasonal concentration and infrastructure strain the pilgrimage circuit alone imposes, as documented in Chapters 13 and 14. The most culturally distinctive asset in this inventory, however, is neither a place nor a season but a periodic ritual event, the Nanda Devi Raj Jat, held once every twelve years and popularly termed the Himalayan Mahakumbh, a roughly 280 kilometre, 18 to 20 day trek beginning at Nauti village in Chamoli district and culminating at the high altitude meadows near Roopkund and Homkund, at altitudes approaching 5,000 metres (Wikipedia, Nanda Devi Raj Jat, n.d.). The most recent edition was postponed from its scheduled 2026 date to 2027, illustrating that even the state's most singular cultural asset is not immune to the same logistical and preparedness constraints that affect its annual Char Dham operations (Wikipedia, Nanda Devi Raj Jat, n.d.).

19.2 Tourism Infrastructure, Hotels, Connectivity and Facilitation

Connectivity investment aimed squarely at the tourism sector has accelerated sharply across 2025 and 2026. The single largest such investment is the Rishikesh-Karnaprayag rail line, a 125 kilometre broad gauge project of which more than 85 percent of the alignment runs through tunnels, using Tunnel Boring Machine technology for the first time in Indian mountainous terrain, and which had reached 72 percent physical progress with approximately 26,841 crore rupees spent of an estimated 38,953 crore rupee total cost as of January 2026, though the original 2026 completion target has since been revised to December 2028 given the scale of the tunnelling challenge (Swarajya, 2026). Once operational, the line will cut travel time between Rishikesh and Karnaprayag from roughly seven hours by road to just over two hours, directly serving the Char Dham pilgrimage corridor examined in section 19.1 and forming the planned backbone of a wider Char Dham Railway network intended to eventually connect all four shrine towns (Railway News, 2025; Mero Uttarakhand, 2026). A second major transit project, the Dehradun-Rishikesh-Haridwar Metro Rail corridor, approved by the Unified Metropolitan Transport Authority in June 2020 at an estimated cost of 40,150 crore rupees, will link the three cities via a 73 kilometre, two phase corridor once complete, addressing intercity movement within the state's most tourism dense plains and foothill belt rather than the high altitude pilgrimage routes the rail line targets (Wikipedia, Uttarakhand Metro, n.d.).

Point to point connectivity for the most physically demanding pilgrimage routes has been addressed through a parallel ropeway building programme under the national Parvatmala

scheme, including a 13 kilometre Sonprayag to Gaurikund to Kedarnath ropeway valued at 985 crore rupees and further ropeways planned for Mussoorie and Yamunotri worth a combined 700 crore rupees, alongside an 18,520 crore rupee Sharda Corridor project launched in October 2025 intended to boost tourism connectivity and local economic growth in the state's eastern districts (IBEF, 2025). The Kedarnath ropeway in particular is intended to reduce what is currently a multi hour trek on foot or pony from Gaurikund to a journey of well under an hour, a change with direct implications for the elderly and less physically able pilgrims who make up a meaningful share of Char Dham visitor numbers and who have historically been unable to complete the pilgrimage on foot, extending the addressable pilgrim market in a way that the road and rail investments discussed above, focused on approach connectivity rather than the final, steepest stretch of each pilgrimage route, do not by themselves achieve. On accommodation, the state government has moved to formalise and expand community based lodging through the uttarastays.com homestay portal, which listed approximately 5,000 properties and was credited with supporting nearly 80,000 livelihoods, a policy direction reinforced by an October 2025 reduction in the Goods and Services Tax rate applicable to hotel rooms above 7,500 rupees a night from 12 percent to 5 percent across key destinations including Nainital, Mussoorie, Auli, Haridwar, Rishikesh and Chopta (IBEF, 2025). The homestay portal's design, channelling bookings toward small, individually run rural properties rather than only conventional hotels, gives the state a tourism accommodation model that keeps a larger share of visitor spending within the host village itself, a structural advantage for rural hill economies compared with a model built primarily around larger hotel chains headquartered outside the district where the actual visitor experience takes place, and one that connects directly to the out migration concerns this framework has traced through its education, energy and social justice chapters, since a homestay income stream gives hill households a further reason to remain in place rather than migrate to the plains for work. Taken together, this cluster of rail, metro, ropeway and tax measures represents a coordinated infrastructure push, though the repeated timeline slippage on the flagship rail project, from an original 2025 target to 2026 and now 2028, is a pattern this framework's Chapter 8 transport discussion and Chapter 13 environmental governance discussion would both recognise as characteristic of large infrastructure delivery in the state's difficult mountain terrain.

Institutionally, accommodation and facilitation infrastructure in the state's hill districts still runs substantially through two long standing public sector corporations, the Garhwal Mandal Vikas Nigam and the Kumaon Mandal Vikas Nigam, which between them operate guest houses across the pilgrimage and hill station circuit and which this chapter's section 19.6 discussion of the state's film policy also references directly, since discounted GMVN and KMVN accommodation forms part of the incentive package offered to film productions. That the same two corporations appear across both the pilgrim accommodation and film production facilitation functions illustrates how concentrated the state's tourism supporting infrastructure remains in a small number of public institutions, a structure that offers coordination advantages but also means capacity constraints or service quality issues at GMVN or KMVN properties have outsized effects across multiple tourism sub sectors simultaneously, rather than being contained within a single niche of the visitor economy.

19.3 Domestic and International Tourist Flows, Trends and Targets

Uttarakhand's tourist volumes are large relative to the state's own population and have grown rapidly even as the sector's overall economic weight remains moderate by the standards of India's leading tourism states. The state received approximately 5.35 crore tourists in 2022, and Ministry of Tourism data for 2023 recorded 54.64 million domestic tourist visits, a 3.16 percent share of India's total domestic tourist footfall that year, while cumulative visitor numbers across the three years to 2025 were reported at more than 20 crore, a scale of repeat and sustained visitation that few Indian states of Uttarakhand's modest population size can match (Interes Journals, 2025; Travel And Tour World, 2025). This trajectory of rapid growth was itself forecast well in advance, an earlier academic projection anticipated that Uttarakhand's tourism sector would more than double over the decade to 2026, reaching an estimated 67 million visitors, a target the state's actual 2022 and 2023 figures suggest it was already approaching or exceeding well ahead of that projected horizon (Interes Journals, 2025). For 2025 specifically, approximately 50 lakh pilgrims were projected to visit the four Char Dham shrines, a figure that dwarfs the 243,012 visitors Kedarnath and 199,409 visitors Badrinath recorded in 2021, though that earlier year's much lower figures reflected pandemic era restrictions rather than a genuine baseline (Travel And Tour World, 2025; Interes Journals, 2025).

Despite these large absolute numbers, tourism's structural weight in the state economy remains more modest than its cultural prominence might suggest, contributing approximately 4.4 percent of Uttarakhand's Gross State Domestic Product and around 2 percent of total state employment, a share that trails several other Indian states with comparably strong tourism identities, including Goa at over 16 percent of state output and Rajasthan at approximately 15 percent, and even Jammu and Kashmir at roughly 7 percent (Tourism India Online, 2025).

This gap is partly explained by the composition of Uttarakhand's visitor base, which skews overwhelmingly domestic and religious rather than international and leisure oriented. National tourism industry commentary from mid 2025 flagged an overall decline in foreign tourist arrivals and their GDP contribution across India as a sector wide concern, and Uttarakhand's own tourism statistics, dominated by the tens of millions of domestic Char Dham and Kumbh pilgrims discussed above, do not feature prominently in the international arrival figures driving that national conversation, meaning the state's tourism growth story and India's broader foreign arrival concerns are, to a significant extent, describing two different visitor markets rather than a single national trend (Tourism India Online, 2025). This composition has direct fiscal implications, since international visitors typically carry materially higher average per trip spending than domestic pilgrimage visitors travelling on tight, multi day religious itineraries, meaning Uttarakhand's very large domestic visitor volumes translate into a comparatively modest GSDP share precisely because pilgrimage tourism, however voluminous, is not the highest per visitor spending category of tourism a state can attract.

Industry analysis attributes this gap partly to a broader, sector wide problem rather than one specific to Uttarakhand, many state tourism departments across India, this analysis notes, lack

robust base data and rigorous tourist spend analysis, an observation consistent with the data transparency gaps this framework has documented across its education, social justice and environmental governance chapters. Closing that gap between visitor volume and measured economic contribution, rather than simply continuing to grow arrival numbers, is arguably the more urgent statistical and policy priority for the state's tourism department, since a state already receiving over 20 crore visitor trips in three years has less to gain from further volume growth than from better capturing and reinvesting the economic value that volume already generates.

19.4 Cultural Heritage Preservation and Institutional Framework

Uttarakhand's most significant recognised intangible cultural asset is Ramman, the masked ritual theatre and religious festival of the Garhwal Himalaya, inscribed on UNESCO's Representative List of the Intangible Cultural Heritage of Humanity, performed in the villages of Saloor and Dungra in Chamoli district in the days following Baisakhi each year through more than ten days of storytelling, dance, music and ancestral worship (The Travel It, 2025). The festival integrates the community's religious, artistic and oral historical practices into a single, continuous performance cycle rather than treating each as a separate cultural product, a structure UNESCO's own inscription criteria specifically recognise as the kind of living, community sustained heritage practice most at risk of erosion under modernisation pressure, precisely the same pressure this framework has documented in relation to hill district out migration in Chapters 5, 7 and 9. The festival's material culture connects directly to the state's craft economy discussed in section 19.5, since the hand carved wooden masks used in Ramman performances are themselves a distinct, GI recognised handicraft tradition, illustrating how the state's intangible and tangible heritage protection frameworks reinforce one another in practice even where they sit under different institutional custodianship. The Nanda Devi Raj Jat, described in section 19.1, functions as the state's second major heritage institution, preserved through a centuries old partnership between the Garhwal royal descendants and their hereditary Nautiyal Brahmin priests, whose ceremonial presence is considered essential to the pilgrimage's legitimacy, a governance model built on hereditary religious authority rather than a conventional state heritage department (Wikipedia, Nanda Devi Raj Jat, n.d.).

Beyond these two flagship traditions, the state's heritage calendar includes Harela, a July festival marking the onset of the monsoon through sapling planting and the exchange of sprouted greens as a living, practised form of ecological stewardship rather than a purely symbolic observance, Phool Dei, a spring festival in which young girls carry flowers door to door, and a distinctly regional style of Holi celebrated in Kumaon through music and song rather than the colour throwing more commonly associated with the festival elsewhere in India (Mero Uttarakhand, 2026; The Travel It, 2025).

Living performance traditions run alongside this festival calendar as a distinct heritage category in their own right. Chholiya, a sword dance native to Kumaon originally performed to accompany wedding processions and now staged at a wider range of auspicious occasions,

and Langvir Nritya, an acrobatic dance from Chamoli district in which performers climb a tall bamboo pole to display balance and strength, together represent the more physically demonstrative end of the state's dance repertoire, while Pandav Nritya, practised across the Garhwal region, retells episodes from the Mahabharata through masked, ritualised dance theatre performed by village amateurs accompanied by the dhol, damau and long trumpets called bhanakore, a structural cousin of the same masked ritual theatre tradition that defines Ramman itself (Travel Setu, n.d.; UK Digital, 2020). That Uttarakhand's living performance heritage spans from martial display, through acrobatics, to epic re enactment within a geographically compact set of hill districts underscores how much cultural density the state's heritage preservation framework is responsible for safeguarding relative to its modest population and administrative capacity.

The ancient Jageshwar Dham temple complex in Kumaon, a cluster of more than one hundred stone temples dating across several centuries of continuous construction and associated with Lord Shiva, alongside the ritual and pilgrimage sites already discussed, rounds out a heritage landscape that combines built temple architecture, living ritual performance and periodic mega pilgrimage into a single, densely layered cultural asset base, one whose institutional preservation currently runs through a patchwork of UNESCO recognition, hereditary religious governance and state tourism department promotion rather than a single, unified heritage authority, a fragmentation this framework's recurring recommendation for integrated, cross departmental reporting, already made in Chapters 5, 7 and 13, applies to with particular force here.

19.5 Creative Industries, Handicrafts, Performing Arts and Cultural Economy

Handicraft production in Uttarakhand has become an increasingly formalised creative economy sector over the past five years, anchored by Geographical Indication registration of the state's most distinctive traditional crafts. Aipan, the Kumaoni ritual folk art in which women paint intricate geometric and religious designs in white rice paste on a red ochre background during festivals, weddings and religious occasions, received its GI tag in December 2021, and the state added a further eighteen GI registrations in a single day in October 2024, a batch that included Kumaoni Raga, a traditional Himalayan musical form, alongside Ringal craft, the weaving of hill bamboo into baskets, trays and household items in Chamoli, Bageshwar and Almora districts, producing goods that typically last twenty to twenty five years (Sonisvision, 2024; Aipankari, 2025). Likhai, the tradition of wood carving found on temple doors, windows and pillars across the hill districts, and Tamta copperware, produced by hereditary coppersmith communities using techniques with roots reaching back toward the Indus Valley civilisation, round out the state's principal GI recognised craft traditions, alongside the Ramman mask carving tradition already discussed in section 19.4 (Aipankari, 2025; Uttarakhand Handloom and Handicraft Development Council, n.d.).

Institutional support for this sector has strengthened correspondingly. The state government approved 10 crore rupees in December 2024 for new craft training centres in Almora and Chamoli, and the Uttarakhand Handloom and Handicrafts Development Council launched an

e-marketplace in February 2025 intended to connect artisans directly to global buyers, complementing the state's first dedicated Geographical Indication products gallery, which opened at the Forest Training Academy in Haldwani displaying more than thirty GI tagged items spanning handicrafts and agricultural products alike, including perishable specialties such as Munsiyari White Rajma and Ramnagar Litchi alongside the craft items already discussed (Tehri Garhwal, 2025; New Kerala, 2026). Nationally, the handicraft sector this GI push forms part of now spans 318 GI tagged handicraft products and roughly 455 formally classified craft categories, a scale of registration activity that places Uttarakhand's own eighteen product single day batch, and its earlier Aipan registration, within a genuinely competitive national landscape of states racing to formalise traditional craft protection (News on Air, 2025).

The craft sector's organisation also reflects a deliberate district specialisation, Ringal weaving concentrated in Chamoli, Bageshwar and Almora, Tamta copperware production tied to hereditary coppersmith lineages whose techniques trace back toward the Indus Valley civilisation and the archaeological sites of Mohenjo Daro and Harappa, and Likhai wood carving practised through inherited apprenticeship on the temple doors, window frames and pillars of the hill districts (Uttarakhand Handloom and Handicraft Development Council, n.d.; Aipankari, 2025). This geographic and craft specific specialisation means that a single training centre investment, such as the December 2024 allocation for Almora and Chamoli, simultaneously touches Ringal weaving, Aipan painting and wood carving communities in those specific districts rather than serving a single undifferentiated statewide craft sector, a targeting logic the state's Handloom and Handicraft Development Council appears to have built its recent investment pattern around even where, as this chapter has noted, comprehensive artisan income outcome data remains unpublished.

This combination of GI registration, dedicated training infrastructure and direct to market digital access represents a genuinely coherent creative economy strategy, though its ultimate success will depend on whether artisan household income data, which was not available in the sources reviewed for this chapter, shows the sector converting cultural recognition into durable livelihood gains rather than symbolic protection alone, the same evidence gap this framework has flagged repeatedly across sectors that combine strong cultural or conservation credentials with weak outcome level reporting.

19.6 Film, Media and Content Industries as Economic Drivers

Uttarakhand has built one of India's more assertive state film policies, and the results are now visible in a steady stream of major productions using the state's landscapes. Notable earlier productions, from Kedarnath and Shershaah to the quieter, Dehradun set Out of Love, established the state's cinematic identity well before the 2024 policy revision, and the state's own officials frame the current subsidy architecture as a deliberate effort to convert that organic popularity among filmmakers into a structured, government backed industry rather than leaving it to arise informally from location scouting decisions alone. The Uttarakhand Film Policy of 2024 offers a subsidy of 30 percent of production costs incurred within the

state, capped at 3 crore rupees, for Hindi language films that complete at least 75 percent of principal photography in Uttarakhand, alongside a more generous 50 percent subsidy, capped at 2 crore rupees, for productions in regional and Eighth Schedule languages, an additional 10 percent subsidy for content targeting younger audiences, and a further 5 percent for productions that shoot for at least seven days in newly designated hillside locations selected by the state's Film Development Council (Garhwal Post, 2024; Uttarakhand Film Development Council, n.d.). The February 2024 policy revision increased the regional language subsidy cap eightfold and doubled the Eighth Schedule language subsidy from 1.5 crore to 3 crore rupees, a deliberate weighting toward Garhwali, Kumaoni and Jaunsari language productions specifically, distinguishing Uttarakhand's approach from film policies in most other states that treat all non Hindi productions under a single regional category (Drishti IAS, 2024). Administratively, the policy is backed by a single window clearance system that the Film Development Council's own officials describe as delivering all required permissions within three to seven days, waived shooting fees, and discounted accommodation at Garhwal Mandal Vikas Nigam and Kumaon Mandal Vikas Nigam tourism department guest houses, a facilitation package the state was recognised for through a special mention at the 66th National Film Awards in 2017 (Invest Uttarakhand, n.d.; Asianet Newsable, 2026). This 2017 recognition matters for context, it shows the state's film friendly positioning predates the 2024 policy revision by several years, meaning the current subsidy structure represents an intensification of an established strategic direction rather than an entirely new departure, a distinction that lends the policy's continuity a credibility that a newly announced, untested incentive scheme would not yet have earned with production houses weighing where to commit shooting schedules and budgets.

The policy's commercial impact is now measurable in production volume, state officials report that more than 200 films, web series and television serials are shot in Uttarakhand annually, a flow that has included theatrical successes such as Kedarnath, Shershaah, Batti Gul Meter Chalu and The Kashmir Files, alongside a growing roster of OTT productions including Guns and Gulaabs, Apharan and its second season, Candy and the second season of Breath, each using the state's landscapes as a substitute for, or occasionally the actual subject of, their narrative setting (Garhwal Post, 2024; Asianet Newsable, 2026). Beyond direct production spending captured by the subsidy scheme itself, this volume of activity generates local employment across a wide occupational range, location scouts, junior artists, drivers, caterers and hospitality staff in towns along the shooting circuit, though a consolidated estimate of the total number of local jobs this 200 plus annual production count generates was not available in the sources reviewed for this chapter, another instance of a state measuring its policy inputs, subsidy disbursement and production counts, more thoroughly than the downstream employment and income outcomes those inputs are ultimately meant to produce.

This volume of production activity connects directly to the tourism asset inventory examined in section 19.1, since location driven tourism, visitors travelling specifically to sites made famous by a film such as Kedarnath, is a well established phenomenon in Indian domestic tourism, meaning the film policy functions simultaneously as a creative industry subsidy and as an indirect, lower cost marketing channel for the tourism sector more broadly. Whether the

state has formally measured this location tourism spillover effect, tracking visitor numbers to specific sites before and after a major film's release, was not confirmed in the sources reviewed for this chapter, representing one further instance of a state achieving genuine sectoral success without yet building the disaggregated measurement framework needed to demonstrate and optimise that success systematically, a pattern this chapter's six sections share with nearly every other sector this framework has examined.

Taken together, the six sections of this chapter describe a tourism, culture and creative economy sector whose genuine strengths, an assertive and internationally recognised film policy, a growing portfolio of GI protected crafts, a UNESCO recognised living heritage tradition, and visitor volumes among the largest of any Indian state, have not yet been matched by the economic measurement and cross sector coordination needed to convert that volume and recognition into a GSDP contribution proportionate to the state's cultural prominence. The 4.4 percent GSDP share documented in section 19.3, set against tourist volumes exceeding twenty crore visits in three years, is the clearest single number in this chapter illustrating that gap, and closing it will depend less on attracting still more visitors, film productions or GI registrations, all of which the state has demonstrated real capacity to generate, and more on building the same kind of integrated, outcome focused measurement architecture that this framework has recommended for the education, social justice, environmental and disaster management sectors examined in earlier chapters. A tourism, culture and creative economy strategy this rich in genuine assets deserves an evidence base equally rich in tracking what those assets actually deliver for the households and artisans whose livelihoods depend on them

Chapter 20: Cross-Cutting Themes and Integrated Policy Imperatives

The preceding chapters of this framework have examined Uttarakhand sector by sector, health, water, urban development, governance, agriculture, each revealing its own version of a pattern that recurs too often to be coincidental: genuine, sometimes national-leading achievement on headline indicators, sitting alongside documented or plausible gaps in implementation, verification and reach into the state's hill districts specifically. This chapter steps back from individual sectors to examine themes that cut across all of them, the state's Sustainable Development Goals performance, gender mainstreaming, youth and the demographic dividend, migration, science and technology, the statistical system that is supposed to measure all of the above, and the channels through which citizens hold the state accountable for it. None of these seven themes fits neatly inside a single government department's mandate, which is precisely why each has proven harder to track consistently across this framework's more department-aligned sectoral chapters, and precisely why gathering them together in one place, at the close of this framework's sectoral review and immediately before its concluding vision and roadmap chapter, is worth doing deliberately rather than leaving each theme scattered across the chapters where it happened to surface.

20.1 Sustainable Development Goals of the state

Uttarakhand's headline performance on the United Nations Sustainable Development Goals, as measured through NITI Aayog's SDG India Index, is genuinely striking. In the fourth edition of the index, Uttarakhand and Kerala tied as the top-performing states with a score of 79, with Tamil Nadu following at 78, and Goa at 77 (Business Today, 2024). Uttarakhand's score rose from 9th place in 2019 (SDC Foundation, 2024). India's overall SDG score improved to 71 in 2023-24 from 66 in 2020-21 and 57 in 2018, with all states showing improvement, driven by targeted interventions in poverty reduction, economic growth, and climate action (Drishti IAS, 2024). The largest increase in score was observed in Climate Action, rising from 54 to 67, followed by No Poverty, rising from 60 to 72, while India's overall score remained below 50 only for Goal 5, Gender Equality (India Briefing, 2024), a finding this chapter returns to directly in section 20.2.

Uttarakhand has made significant progress in including SDGs in state and district planning, creating a detailed State vision document and specific plans for each district; the Centre for Public Policy and Good Governance leads SDG implementation by coordinating with state departments and holding district-level workshops to develop vision frameworks and action plans, and the state has successfully integrated SDGs into District and Gram Panchayat Development Plans, with SDG indicator frameworks set up at both levels (SDC Foundation, 2024), extending SDG monitoring down to the lowest tier of elected local government examined in Chapter 12.1 rather than treating it as a state-level exercise alone. Uttarakhand's scores ranged from 72 to 85 in different areas (SDC Foundation, 2024), a comparatively narrow spread suggesting more even performance across goals than a state with a few very high and very low outlier scores would show.

This top ranking, however, sits in some tension with specific findings this framework has documented in its sectoral chapters: a maternal mortality ratio that rose against the national

trend as shown in Chapter 6.3, an urban local body sector raising barely a fifth of its own expenditure as shown in Chapter 11.2, and, as this chapter's own section 20.4 documents at length, a hill-district hollowing-out crisis that has proven remarkably resistant to a decade of dedicated policy attention. None of this necessarily contradicts the SDG Index result, since the index aggregates a great many indicators into a composite score and genuine strength in some dimensions, health insurance coverage breadth, digital governance infrastructure, forest cover, can coexist with the specific weaknesses this framework has documented in granular sectoral detail. But it does suggest that Uttarakhand's SDG ranking, like the investment and AMRUT completion figures examined in Chapters 4 and 11, is best read alongside the more disaggregated findings in this framework's sectoral chapters rather than treated as a standalone verdict on the state's development performance.

A further methodological point is worth making explicit for readers inclined to treat the SDG Index score as the single authoritative summary of state performance this framework could have simply led with instead of its own chapter-by-chapter approach. The index uses 113 indicators to evaluate the performance of each state aligned to the Ministry of Statistics and Programme Implementation's National Indicator Framework (Rau's IAS, 2024), meaning it necessarily relies on the same underlying administrative and survey data sources, NFHS rounds, Sample Registration System bulletins, departmental scheme reporting, that this framework's own sectoral chapters have drawn on and, in several instances, found to carry significant currency or disaggregation limitations. A composite index inherits the data quality of its inputs; where this framework has flagged a specific statistic as dated, unverified at district level, or based on a secondary compilation rather than a primary source, the corresponding SDG Index sub-score built from that same statistic carries the identical limitation, even though the Index's own published methodology does not surface this chapter-by-chapter caveat to a reader encountering only the headline composite score.

20.2 Gender Mainstreaming Across Sectors

Uttarakhand's most substantive and long-standing gender mainstreaming achievement lies in local governance representation. Uttarakhand adopted 50 percent reservation for women in Panchayati Raj Institutions from its formation, among states that raised their legal quota to 50 percent alongside Bihar, the first state to do so in 2006, and Rajasthan in 2010 and Chhattisgarh in 2008 (Bharatdocs, 2026). This reservation has translated into substantial representation on the ground: Manju Bora is one of 35,177 elected women representatives in the 7,485 panchayats of Uttarakhand, which has the distinction of being among those states that boast the most women in their Gram Panchayats (Behanbox, 2025), part of a national pattern in which approximately 14.5 lakh women, about 46 percent of all elected local representatives, serve in Panchayati Raj Institutions across India as of March 2025, the highest proportion of women in local elected office of any country in the world (Bharatdocs, 2026).

This headline representation figure, however, masks meaningful variation across different types of local institutions. Research examining six Van Panchayats in Almora district found

that women's participation in van panchayats remains markedly lower than in gram panchayats, both in executive committees and general assemblies, and that this low participation cannot be explained solely by sociocultural norms and state interference; instead, the subsistence livelihood needs of households are crucial to women's involvement in van panchayats (Economic and Political Weekly, 2025), a finding illustrated vividly by one elected Gram Panchayat Pradhan's daily routine: Manju leaves home at 4 am to cut and gather the harvest with hundreds of other women, and is back home by 6 am to clean her house and make breakfast and lunch for her children before starting her day as Gram Panchayat Pradhan (Behanbox, 2025), a pattern of layered labour this framework's Chapter 6.7 discussion of hill women's health burden and Chapter 18.1 discussion of hill agriculture's labour intensity both anticipate without fully naming.

Gender mainstreaming shows more mixed results outside local governance. As of April 2025, 50 percent of startups recognised in Uttarakhand had been founded by women (StartupFlora, n.d.), a figure well above most states' comparable share and consistent with the explicit inclusion goals written into the state's new Science, Technology and Innovation Policy 2026 examined in section 20.5, which seeks to ensure inclusive participation in science and innovation by providing equal opportunities to women, rural communities and grassroots innovators (Indian PSU, 2026).

Beyond these programme-specific figures, gender budgeting as a systematic public financial management practice, tagging state budget allocations by their differential impact on women and men across every department rather than only within dedicated women-focused schemes, is a tool several Indian states have adopted with varying degrees of rigour following the Union government's own Gender Budget Statement practice at the national level. Whether Uttarakhand's own state budget process incorporates a comparably systematic gender-tagging exercise across departments, as distinct from the specific women-reservation and women-founder figures already documented in this section, could not be confirmed from the sources available for this chapter, a gap that matters because gender budgeting, done well, would allow the state to identify exactly the kind of uneven mainstreaming pattern this section has already found between Gram Panchayats and Van Panchayats, extending that same disaggregated scrutiny to health, education, agriculture and industrial policy spending rather than relying on scheme-by-scheme figures assembled after the fact, as this chapter has had to do.

Set against this, the migration patterns examined in section 20.4 carry a strong, under-analysed gender dimension: out-migration from hill villages is disproportionately an outflow of working-age men seeking employment, leaving women, children and the elderly to manage remaining household agriculture and livestock, a pattern implicit in the Van Panchayat participation research above and in the hill demographic profile this framework's Chapter 6.7 discussion of population ageing describes, but one that this chapter's sources did not allow to be quantified with a specific, current, gender-disaggregated migration statistic. Closing that specific data gap, the actual sex ratio of hill out-migrants rather than the aggregate migration figures section 20.4 relies on, would materially improve this framework's

ability to assess whether the state's gender mainstreaming successes in formal governance representation are being undermined or reinforced by the informal, demographic reality of who actually leaves and who stays in the state's emptying hill villages.

20.3 Youth Policy and Demographic Dividend Realisation

The Uttarakhand government approved the National Youth Policy 2014 for youths aimed at imparting employment-oriented training, under which every government department allocates funds with the Youth Welfare Department acting as nodal agency; the Government of India adopted a new National Policy on Skill Development and Entrepreneurship in 2015, replacing the earlier 2009 policy, aiming to meet the challenge of skilling at scale with speed and quality (IJRASET, n.d.).

The demographic dividend this policy architecture is meant to realise faces a specific and serious obstacle in Uttarakhand: youth unemployment is around 20 percent compared to the all-India average of 15 percent, joblessness among educated youth is around 40 percent of graduates, and the incidence of unemployment is disproportionately higher in the hill districts compared to the three plain districts, with joblessness a major trigger for out-migration from hills to the plains (IJRASET, n.d.). This concentration is not incidental to this chapter's broader argument; it is close to the proximate cause of the migration crisis examined in section 20.4, since joblessness among educated hill youth functions as the single most direct trigger for the hill-to-plains and hill-to-elsewhere out-migration this framework has now documented from multiple angles across several chapters.

Policy responses have concentrated on two tracks. The DDU-GKY 2.0 initiative targeted over 2,783 youth in Uttarakhand for the year, requiring domain-specific skill training of a minimum 576 hours, a minimum 70 percent job placement with at least 50 percent in wage employment, and participation targets of 33 percent for women, 19 percent for Scheduled Castes, 3 percent for Scheduled Tribes and 10 percent for minorities (Econsultancy India, 2025). Separately, the Devbhoomi Udyamita Yojana, envisioned by Chief Minister Pushkar Dhami, targets new enterprise creation through youth training interventions, with Uttarakhand's 79.63 percent literacy rate positioning it advantageously to imbibe the competencies required for new ventures (Department of Higher Education, Uttarakhand, n.d.), complementing the broader startup ecosystem examined in section 20.2, which counted over 1,300 DPIIT-recognised startups as of April 2025, with the state announcing a Rs 200 crore Venture Fund in April 2025 to provide financial backing to startups and catalyse innovation (StartupFlora, n.d.).

Whether these skilling and entrepreneurship interventions are growing fast enough to absorb the specific 40-percent graduate unemployment figure cited above, as opposed to running as valuable but comparatively small-scale programmes alongside a much larger underlying unemployment problem, is a question this chapter's sources do not allow a confident answer to; the DDU-GKY target of under 3,000 placements statewide in a single year, set against a state with several hundred thousand young people entering the labour force annually,

illustrates the scale mismatch between the state's active labour market programmes and the underlying demographic dividend challenge they are meant to address.

A further mismatch runs beneath the aggregate unemployment figures themselves: the specific finding that graduate unemployment runs meaningfully higher than overall youth unemployment suggests the state's higher education output is not well calibrated to the kind of jobs its own economy, tourism and hospitality, small-scale manufacturing, agriculture and allied sectors, actually generates in the volume needed. This is consistent with the return-migrant skill mapping this chapter's section 20.4 examines, which found the majority of returning migrants had prior experience in hospitality and services rather than in formal degree-linked professional employment, and with the Science, Technology and Innovation Policy 2026 examined in section 20.5, whose explicit local-employment rationale implicitly acknowledges that the state's existing higher education and labour market architecture has not, on its own, been sufficient to retain the educated youth it produces.

20.4 Migration: Internal, Inter-State and International Dimensions

Migration, locally termed *palayan*, is arguably the single most politically charged and thoroughly documented cross-cutting theme in Uttarakhand's development discourse, touching nearly every sector this framework has examined, health staffing in Chapter 6.1, urban slum formation in Chapter 11.6, agricultural labour availability in Chapter 18.1, and civil service retention in Chapter 15.7, without any single sectoral chapter fully capturing its scale or its self-reinforcing dynamics.

The Uttarakhand government constituted the Gramya Vikas evam Palayan Aayog in August 2017 for evolving strategies for facilitating faster development of the hill districts and restricting out-migration; in July 2022 it was renamed Palayan Nivaran Aayog, reflecting a shift from study-based analysis to a more proactive migration-prevention approach, with the Chief Minister as Chairman and the Chief Secretary chairing the implementation committee; as of late 2025, the commission had submitted more than 16 reports to the state government (Sarkari Edge, 2025). The commission identified around 1,768 villages as ghost villages, and more than 3.5 lakh people migrated from their native places between 2011 and 2017 (Sarkari Edge, 2025), raising the total from an earlier count in which 734 villages became depopulated between 2011 and 2018 on top of 1,034 ghost villages counted till 2011 (The Print, 2022). By 2011, more than 40 lakh people had left the state, roughly 40 percent of its entire population (Local Samosa, 2026). On average, 138 people migrate from Uttarakhand every day, according to Anoop Nautiyal, founder of the Dehradun-based Social Development for Communities Foundation (The Print, 2022), a flow that Chapter 15's discussion of Uttarakhand's civil service and Chapter 6's discussion of its rural health staffing gaps both suggest is disproportionately drawing away exactly the trained, working-age population the state's own institutions most need to retain.

Rural Development and Palayan Aayog completed skill mapping of all return migrants during the pandemic, reporting that 58 percent were engaged in the hospitality and service sectors, that 81 percent of return migrants arrived from different states, 18 percent from different

districts within the state, and about 0.3 percent from foreign countries (Indian Journal of Labour Economics, 2020), confirming that domestic, inter-state labour migration rather than international emigration dominates the state's outflow. Since the government's focus for self-employment creation is on tourism, adventure sports and homestay tourism, this skill mapping helps return migrants access self-employment opportunities in these activities, alongside horticulture, micro-food processing, animal husbandry, poultry, dairying and organic farming (Indian Journal of Labour Economics, 2020), sectors this framework has examined in Chapters 18 and 19.

The near-total absence of international emigration in the commission's own return-migrant data is itself a notable finding given how prominent international migration has become in the development narratives of several other Indian states, Kerala and Punjab most obviously, whose economies have been substantially shaped by Gulf and Western remittance flows respectively. Uttarakhand's migration story, by contrast, remains an overwhelmingly domestic, inter-state phenomenon, with its emptied hill villages feeding labour markets in Delhi, Mumbai and other Indian metros rather than sending workers abroad in comparable volume.

As per the 2011 census, about 17 percent of the population of the hill districts of Uttarakhand lives in urban areas while in the plains districts 42 percent of the population lives in urban areas, and per capita income in Bageshwar, Champawat, Tehri and Almora districts is less than half of that in Dehradun and Haridwar districts (Uttarakhand Palayan Aayog Report, n.d.), a gap this framework's Chapters 4 and 18 have traced respectively to industrial investment concentration and agricultural productivity constraints specific to hill terrain. Uttarakhand has launched successive programmes aimed at reversing palayan, MGNREGA, rural livelihood missions, ecotourism incentives, organic farming schemes; the intent is sound, but the gap between intent and execution (Local Samosa, 2026) remains, and no visible efforts have been seen to revitalise ghost villages during the three years since the Commission was constituted, though some district reports have been prepared and survey work undertaken without action plans for sustainable livelihoods (Indian Journal of Labour Economics, 2020). Given how directly migration functions as the demand-side driver behind the youth unemployment documented in section 20.3, the health staffing gaps documented in Chapter 6.1, and the civil service retention challenges documented in Chapter 15.7, this framework's overall assessment is that migration should be treated less as a distinct standalone chapter theme than as the single most important lens through which the success or failure of the state's entire hill-district development strategy, across agriculture, industry, health and governance alike, ought ultimately to be judged.

20.5 Science, Technology and Innovation for Development

The Uttarakhand government released the Science, Technology and Innovation Policy 2026 under Chief Minister Pushkar Singh Dhami, issued by the Department of Information Technology, Science and Technology, seeking to integrate science and technology with governance, disaster management, education, agriculture, healthcare and employment

generation while providing a common platform for youth, researchers, startups, scientists and grassroots innovators; the Uttarakhand State Council for Science and Technology, the nodal agency for science dissemination, will play a key role in implementation (Indian PSU, 2026).

The policy's own stated rationale draws an explicit, direct line to two of this chapter's other central themes. Local employment is framed as creating high-skill jobs in research and technology to prevent the migration of educated youth, described explicitly as brain drain (News Articles Net, 2026), connecting the policy directly to the youth unemployment and out-migration dynamics examined in sections 20.3 and 20.4 above. The policy also seeks to ensure inclusive participation in science and innovation by providing equal opportunities to women, rural communities (Indian PSU, 2026) and other underrepresented groups.

Substantively, the policy identifies agricultural modernisation through precision farming and biotech to increase yield of high-value mountain crops, healthcare accessibility through telemedicine and digital health records to bridge the gap between urban centres and remote mountain villages, and risk mitigation through advanced technological solutions for the region's high frequency of natural disasters, deploying AI, IoT, green technology and biotechnology as key tools (News Articles Net, 2026), connecting directly to the horticulture themes of Chapter 18.7, the healthcare access themes of Chapter 6.1, and the disaster risk themes of Chapter 14.

To ensure effective implementation, the state government will establish an advisory body responsible for policy execution, monitoring and evaluation (Indian PSU, 2026), a governance feature that, if genuinely resourced and empowered rather than existing only on paper, would distinguish this policy from several other state initiatives this framework has documented as strong on stated ambition but thinner on the monitoring infrastructure needed to verify whether that ambition translates into delivered outcomes, the Health and Wellness Centre operationalisation gaps of Chapter 6.1 and the AMRUT service-level improvement plan verification gaps of Chapter 11.4 both being cases in point. Because the policy was released only in June 2026, this framework's sources could not yet confirm implementation progress, specific funding allocations, or measurable early outcomes against any of these stated goals.

20.6 Statistical System Strengthening and Evidence-Based Policymaking

Nearly every chapter of this framework has, at some point, flagged a specific data gap: a current Uttarakhand-specific FDI equity figure that DPIIT's factsheets do not disaggregate, a state-wide milk production total that eluded this chapter's sources, a district-level ODF Plus percentage the national dashboard reports but this research could not query, a Kisan Credit Card penetration rate that would indicate whether the state's agricultural insurance architecture reaches its hill farmers. This recurring pattern is itself a cross-cutting finding worth naming directly rather than treating as a series of unconnected, chapter-specific omissions.

The institutional capacity to close these gaps exists on paper: the Directorate of Economics and Statistics functions as the state's Statistical Authority and Nodal agency for collection, compilation, analysis, interpretation and dissemination of statistical information relating to all sectors of the economy, with a total of 402 posts created for officers and employees across 13 district offices, 2 divisional offices and the Directorate office (Directorate of Economics and Statistics, Uttarakhand, n.d.). The Directorate's District Domestic Product estimates found the largest economy in Dehradun district at Rs 50,687 crore, and the smallest in Rudraprayag district at Rs 2,839 crore (Directorate of Economics and Statistics, Uttarakhand, n.d.), illustrating both the Directorate's genuine analytical capacity and, in the scale of that disparity itself, the intra-state economic inequality that this framework's Chapter 1.7 discussion of aspirational districts and Chapter 3.1 discussion of district-level GSDP variation both examine from different angles.

The gap this chapter identifies, then, is not primarily one of institutional existence or even collection capacity, but of public dissemination reach and disaggregation depth: the specific figures this framework's sectoral chapters have repeatedly flagged as unavailable are, in most cases, plausibly collected somewhere within the state's departmental reporting systems, DES's own district offices, the Health Department's facility-level records, the Agriculture Department's scheme administration data, but are not published in a form, or at a frequency, that allows independent verification of whether headline scheme achievements are being matched by on-the-ground delivery. The Centre for Public Policy and Good Governance's role in coordinating SDG-aligned data across departments, examined in section 20.1, and the Directorate's own district-level office network, offer an existing institutional foundation on which a more systematic public data-dissemination effort could be built without requiring an entirely new statistical apparatus.

The pattern of gaps this framework has documented also has a specific shape worth naming: the missing figures cluster disproportionately around utilisation, verification and hill-versus-plains disaggregation, rather than around headline totals or state-wide averages. This framework encountered little difficulty sourcing a state-wide sanctioned budget figure, a total scheme outlay, or an aggregate coverage percentage for almost any programme examined across its chapters; the recurring difficulty was in sourcing the second-order figure that would confirm whether that headline number translated into delivered service at the district or beneficiary level. This is precisely the distinction this framework's Chapter 15.6 discussion of red-tapism drew between digital throughput and substantive institutional quality, and it suggests that any statistical strengthening agenda for Uttarakhand should prioritise utilisation and outcome reporting specifically, rather than simply publishing more of the same input and allocation data the state already reports comprehensively.

20.7 Public Participation: Behavioural Change and Citizen Engagement

Citizen engagement with Uttarakhand's state and local government runs through several distinct channels this framework has documented in different chapters without previously connecting them as a single accountability architecture. Electoral participation remains robust at the local level: the January 2025 municipal elections across the state's 100 municipalities, filling 1,382 urban local body seats, recorded a turnout of 65.41 percent (Wikipedia, 2026), while the panchayat elections examined in section 20.2 continue to deliver among the highest concentrations of women's representation of any Indian state. Beyond the ballot box, the Right to Information architecture examined in Chapter 15.6, including the state's Online RTI Portal and its Online Second Appeal and Hybrid Hearing System launched in January 2024, provides a digital channel for citizens to compel disclosure of exactly the kind of disaggregated implementation data section 20.6 has identified as chronically under-published, while the Vigilance Establishment's 1064 helpline, examined in Chapter 15.2, functions in practice as a broader citizen grievance channel well beyond its formal anti-corruption mandate, having received 2,209 complaints in 2025 of which more than three-quarters concerned matters outside strict vigilance jurisdiction.

The social audit framework mandated under Section 17 of MGNREGA requires the Gram Sabha to conduct regular social audits through mandatory public hearings, *jan sunwais*, at the village level (Anantam IAS, 2026), at which community members critically assess the implementation of government programs, comparing official records to ground facts through public participation and verification (Accountability Research Center, 2023), with proceedings required to be video-recorded and uploaded on the scheme website without editing (Scribd, 2011). Meghalaya's Community Participation and Public Services Social Audit Act, 2017 mandates social audit in 26 different schemes across education, health and rural development, India's first comprehensive social audit legislation by a state (Anantam IAS, 2026); no comparable cross-scheme social audit legislation extending this practice beyond MGNREGA appears to exist in Uttarakhand specifically, a gap this chapter flags as a concrete, low-cost accountability reform available to the state that would extend the same public-hearing scrutiny already legally mandated for MGNREGA to the health, nutrition and housing schemes examined throughout Chapters 6, 11 and 18 of this framework.

Behavioural change communication, the softer, less legally mandated dimension of public participation, has appeared throughout this framework in scheme-specific form rather than as a coordinated cross-sectoral campaign: the pre-Yatra health advisories examined in Chapter 6.2, the pilgrim waste-carrying campaigns examined in Chapter 10.4, and the Poshan Abhiyaan nutrition behaviour-change messaging examined in Chapter 6.6 each operate as freestanding sectoral communication efforts rather than as coordinated applications of a single, state-wide behavioural science capacity. Consolidating these scattered efforts under a shared behavioural insights capacity could allow lessons from one sector's citizen-engagement success, the "Carry Me Back" pilgrim waste campaign's voluntary participation model, for instance, to inform design choices in another, rather than each department continuing to design its own citizen-facing communication approach in relative isolation from the others, a fragmentation that mirrors the departmental coordination

challenge this framework's Chapter 15.1 discussion already identified as a structural weakness running through the state's administration as a whole.

Read together, this chapter's seven sections point to a single overarching observation about how Uttarakhand's development story should be read. The state's headline achievements, SDG Index leadership, pioneering gender representation quotas, a genuinely reformist new science and technology policy, are real and worth recording without cynicism. But each sits atop a specific, documented structural weakness, uneven implementation reach into hill districts, a persistent and largely unresolved out-migration crisis, statistical gaps concentrated precisely where verification matters most, that this framework has traced consistently across health, water, urban development, administration and agriculture alike. Migration, more than any other single theme examined in this chapter, functions as the thread connecting nearly all of these weaknesses: it is simultaneously a symptom of the hill-district development gaps this framework has documented sector by sector and a cause of the staffing, service-delivery and statistical capacity constraints that make closing those gaps harder. Any future revision of this framework, and any serious state strategy for the vision and roadmap period examined in Chapter 21, would do well to treat reversing hill out-migration not as one policy priority among many but as the organising test against which the success of every other chapter's recommendations should ultimately be measured.

Chapter 21: State Vision 2047, Strategic Priorities and Development Roadmap

This closing chapter brings together the sectoral findings and the cross-cutting themes examined throughout this framework into a single forward-looking assessment, organised around Uttarakhand's own emerging long-term vision process, the medium-term action agenda that process implies, the fiscal and intergovernmental machinery available to fund it, and the monitoring and accountability architecture that will determine whether it is actually delivered. Unlike the preceding chapters, which drew primarily on sector-specific data, this chapter draws deliberately on the state's own planning institutions and documents, and on the pattern of achievement-alongside-implementation-gap this framework has now traced across health, water, urban development, administration, agriculture and the cross-cutting themes of Chapter 20 alike. Its eight sections move deliberately from the most aspirational, the state's own 2047 vision, toward the most immediately actionable, the specific accountability channels available to citizens today, on the view that a vision document earns credibility only to the extent the institutions responsible for delivering it can be held to account along the way.

21.1 Long-Term Vision and Flagship Missions

Uttarakhand's long-term development planning has evolved through two distinct institutional phases since the state's formation. In 2023, the government abolished the State Planning Commission, and the Governor approved formation of the State Institute for Empowering and Transforming Uttarakhand (SETU) on the lines of NITI Aayog at the Centre, ostensibly to achieve the goal of Strong Uttarakhand @2025; SETU works like a think tank in the policy and planning functions of the state government, with the Chief Minister as its chairperson (Garhwal Post, 2023). The commission serves as the state's economic policy descriptive body, having received clearance from the central government and NITI Aayog (Engaging Indian States, 2023). The Planning Minister is appointed as Deputy Chairperson with three advisors, and a CEO provides strategic and intellectual direction for the inclusive economic, social and sustainable development of Uttarakhand while leading day-to-day functioning (Garhwal Post, 2023).

That longer-horizon vision took concrete shape in June 2025. On 16 June 2025, Uttarakhand hosted the "Signal Prioritisation Workshop for the Development of Viksit Uttarakhand @2047 Vision," a strategic initiative aligning with the Prime Minister's call for Viksit Bharat @2047, organised with knowledge partner UNDP, aiming to structure and prioritise over 218 "signals," emerging indicators and trends identified by cross-sectoral working groups spanning climate change, infrastructure development, economy and employment, empowering local self-government, finance, and security peace and justice (UNDP, 2025). The inaugural session was attended by Chief Secretary Anand Bardhan and SETU Aayog's CEO Shatrughna Singh; the initiative builds upon earlier efforts like Vision 2030, with renewed emphasis on co-creation, data-driven decision-making, and adaptability, and its

outcomes will feed into a dynamic Viksit Uttarakhand @2047 Vision Document, a living blueprint periodically reviewed for agility, inclusivity and relevance (UNDP, 2025).

At the level of annual budget framing, the state has adopted a simplified four-pillar communication device. The Uttarakhand Budget 2026-27 is based on the GYAN model, focusing on four pillars, Gareeb (poor), Yuva (youth), Annadata (farmers) and Nari (women), to promote inclusive development (Drishti IAS, 2026), the same framing used in the 2025-26 budget, presented by Finance Minister Prem Chand Aggarwal and aligned with the national vision of Viksit Bharat while specifically targeting Viksit Uttarakhand by 2025, the 25th anniversary of the state's formation (Testbook, 2026). Whether this GYAN framing represents a genuine prioritisation architecture shaping resource allocation decisions, or primarily a communication device layered atop budget allocations decided through more conventional departmental negotiation, is a distinction this chapter's sources do not allow a confident answer to; the test, as with several other headline frameworks this document has examined, will be whether the specific allocations examined in section 21.2 below actually shift toward these four constituencies over successive budget cycles rather than the label alone changing.

SETU Aayog's own leadership has described its approach as ecosystem-based and collaboration-driven: in agriculture alone, the institution works with corporates, NGOs, foundations and industry bodies, each contributing capital, expertise, technology or market access, collaborating with the National Dairy Development Board to strengthen the dairy sector and with the Wadhvani Foundation on entrepreneurship and skilling, while embarking on an association with the Quality Council of India to strengthen Panchayat governance (Elets eGov, 2026). This partnership-oriented design, if it functions as described rather than remaining aspirational, would represent a meaningful departure from the more centralised, single-department policy formulation this framework has documented as characteristic of several other Uttarakhand institutions, the fragmented industrial policy coordination examined in Chapter 15.1 being one such contrast, and its success or failure over the coming years is itself a useful indicator of whether the state's institutional reform ambitions translate into functioning practice or remain confined to organisational charts.

21.2 Medium-Term Priority Action Plan (2025–2030)

Reading across this framework's sectoral chapters and the SETU Aayog and GYAN architecture just described, four medium-term priorities emerge as the areas where this framework's own evidence suggests the state's 2025-2030 planning window carries the greatest stakes. First, reversing or at minimum slowing the hill out-migration documented at length in Chapter 20.4 should be treated, as that chapter argued, as the organising test of this entire period, since nearly every other medium-term priority, youth employment examined in Chapter 20.3, health staffing examined in Chapter 6.1, agricultural productivity examined in Chapter 18.1, connects back to whether the state can create viable hill livelihoods faster than its villages continue to empty.

Second, the Haridwar Ardh Kumbh Mela 2027 functions as the single most concrete, date-certain forcing mechanism currently shaping the state's medium-term infrastructure

agenda. The Uttarakhand government has allocated Rs 1,000 crore in the 2026-27 state budget for preparations, with administrators estimating nearly 17 crore devotees will take part in holy bathing rituals during the event (euttaranchal.com, 2026). The Chief Minister has sought central support for laying underground power lines in Haridwar, infrastructure development and traffic improvement, alongside early approval of around Rs 325 crore for the Ganga Corridor linking Haridwar and Rishikesh, and stressed connecting pilgrimage sites with modern transport such as the Dehradun-Haridwar-Rishikesh Metro Corridor and an RRTS extension from Meerut (The Statesman, 2026), giving this single religious gathering an outsized influence on the state's 2025-2027 capital works pipeline relative to its otherwise modest annual size.

The Kumbh's fixed date carries a specific medium-term planning risk that this framework's own findings elsewhere suggest deserves explicit acknowledgement rather than being treated only as a logistics challenge: the Namami Gange sewage treatment findings examined in Chapter 10.5 already showed the Jagjeetpur STP in Haridwar operating above design capacity years ahead of its planned 2028 horizon even under ordinary conditions, and the Char Dham pilgrim mortality and waste management strains documented in Chapters 6.2 and 10.4 already illustrate how acutely the state's health, waste and crowd-management systems respond to concentrated pilgrimage volumes considerably smaller than a full Kumbh gathering. A mela expected to draw 17 crore participants over a compressed multi-month window will test every one of these systems simultaneously, meaning Kumbh preparedness should be read by this framework's future editions not as a standalone urban infrastructure project but as a stress test of the cumulative capacity, health staffing, water and sanitation, waste processing, disaster response, this entire framework has assessed chapter by chapter.

Third, the Mega Industrial and Investment Policy 2025 examined in Chapter 4.2 and the new Science, Technology and Innovation Policy 2026 examined in Chapter 20.5 together represent the state's medium-term bet on higher-value, more knowledge-intensive economic activity as a complement to the tourism and traditional manufacturing base this framework has documented as already well developed, though both policies remain too recent for this framework to assess delivered outcomes rather than stated intent. Fourth, closing the specific statistical and verification gaps catalogued throughout this framework and named directly in Chapter 20.6 should itself be treated as a medium-term institutional priority, not a housekeeping afterthought, since without better hill-versus-plains disaggregated data, the state's own planning institutions cannot reliably determine whether the first three priorities are actually succeeding.

Sequencing these four priorities against the state's own 2025-2030 window suggests the Kumbh Mela deadline will necessarily dominate near-term capital allocation through early 2027, after which the state's medium-term planning capacity, and its SETU Aayog-led Vision Document process described in section 21.1, will need to pivot toward the slower-moving, less visibly deadline-driven work of migration reversal and statistical system strengthening that this framework's evidence suggests matters more for the state's 2047 horizon than any single infrastructure project, however large.

21.3 Financing Strategy: Resource Mobilisation, Revenue Enhancement and Expenditure Rationalisation

Uttarakhand's fiscal trajectory over its three most recent budget cycles shows a pattern worth stating plainly rather than softening. Fiscal deficit for 2024-25 was targeted at 2.4% of GSDP (Rs 9,416 crore) (PRS Legislative Research, 2024). Fiscal deficit for 2025-26 was targeted at 2.9% of GSDP (Rs 12,605 crore), but by the 2025-26 revised estimate stage, fiscal deficit was expected to reach 3.4% of GSDP, higher than the budgeted 2.9% (PRS Legislative Research, 2025, 2026). Fiscal deficit for 2026-27 is targeted at 3.7% of GSDP (Rs 15,989 crore), higher still than the 2025-26 revised estimate (PRS Legislative Research, 2026), moving progressively further from rather than closer to the 3 percent ceiling states are conventionally expected to observe under fiscal responsibility legislation, including the state's own Fiscal Responsibility Act, 2005, which provides annual targets to progressively reduce the deficit (PRS Legislative Research, 2024). This widening deficit has occurred even as the state's own tax revenue base has strengthened somewhat in relative terms: own tax revenue as a percentage of GSDP was 5.6% in the 2022-23 actuals (PRS Legislative Research, 2024), rising to a targeted 6.1% of GSDP for 2026-27, up from 6% in the 2024-25 actuals (PRS Legislative Research, 2026), indicating that expenditure growth has outpaced even a genuinely improving revenue mobilisation trend.

Outstanding debt stood at roughly Rs 83,000 crore as of the 2024-25 budget, equivalent to a debt-to-GSDP ratio of 21.0%, with interest payments of Rs 6,636 crore consuming 11.0% of revenue receipts, while non-tax revenue of Rs 4,873 crore was boosted by hydropower royalties (GovtBudget.com, n.d.), a resource stream this framework's Chapter 4.6 discussion of state PSU turnover decline and accounting arrears suggests carries its own growth constraints absent reform. Net borrowings are projected to rise from Rs 8,783 crore in 2024-25 to Rs 14,429 crore by 2026-27 (PRS Legislative Research, 2024, 2026), a debt-servicing burden that will mechanically tighten further as the fiscal deficit continues widening.

Expenditure rationalisation, the less politically visible counterpart to revenue enhancement, connects directly to findings this framework has documented in earlier chapters rather than requiring new analysis here: the Urban Local Body own-revenue weakness documented in Chapter 11.2, the establishment-cost dominance of ULB spending noted in that same chapter, and the state PSU turnover decline documented in Chapter 4.6 all represent points where better-targeted state financial management, rather than simply higher aggregate allocation, could improve the state's overall fiscal position without requiring new taxation.

Placed alongside other Indian states, Uttarakhand's fiscal position is neither uniquely troubled nor comfortably secure. National-level analysis found the aggregate fiscal deficit across all major states expected at approximately 3.14% of GSDP for 2025-26, with aggregate state debt holding roughly steady at around 27% of GSDP nationally (Forum for State Studies, 2025); Uttarakhand's own debt-to-GSDP ratio of approximately 21 percent therefore compares favourably to this national aggregate, even as its fiscal deficit trajectory has been

moving in the less favourable direction just described. This juxtaposition, a below-average debt stock but an above-average and worsening deficit trend, suggests the state currently retains fiscal headroom built up in earlier, more disciplined budget cycles, but is drawing down that headroom at a pace that would not be sustainable indefinitely absent either faster own-revenue growth or the expenditure discipline described above, particularly once the concentrated Kumbh-related capital spending examined in section 21.2 works through the state's accounts over the next two to three budget cycles.

21.4 Centre-State Partnership: Centrally Sponsored Schemes and Special Grants

Centre-state financial partnership operates in Uttarakhand along two distinct tracks that this framework's chapters have documented separately without previously connecting them. The first is the standing architecture of centrally sponsored schemes carrying the enhanced 90:10 funding ratio extended to Himalayan special category states, examined across the Jal Jeevan Mission and Swachh Bharat Mission in Chapter 10, PM POSHAN in Chapter 6.6, and PMAY-U in Chapter 11.3, a structural advantage that lowers the state's own matching-fund burden relative to non-special-category states but that this framework has also shown does not, by itself, guarantee full utilisation or verified delivery of the resulting infrastructure.

The second track is project-specific, negotiated special assistance, most visibly on display in the run-up to the Haridwar Ardh Kumbh Mela 2027. CM Pushkar Singh Dhami formally requested Rs 3,500 crore from PM Modi on 14 July 2025 (euttaranchal.com, 2026). The Centre subsequently released Rs 500 crore for infrastructure development and event management in late February 2026 (Indian Masterminds, 2026), and the Chief Minister sought a further Rs 750 crore for Phase-I preparations in April 2026 (The Statesman, 2026), alongside Rs 1,252 crore in previously authorised projects and a further Rs 256 crore allocated in May 2026 under the Planning Department's Special Assistance to States for Capital Investment scheme, including Rs 115 crore for Rishikesh's Triveni Ghat and Rs 69.06 crore for Haridwar's North Har Ki Pauri (The News Mill, 2026), plus Rs 408.82 crore in projects discussed under the National Mission for Clean Ganga (euttaranchal.com, 2026). This iterative, event-specific negotiation pattern, requests followed by partial releases followed by further requests, illustrates how much of the state's large-ticket capital financing for mega-events flows through discretionary, negotiated central assistance rather than through the formula-based devolution examined in section 21.3.

This pattern connects to a broader theme this framework has documented since Chapter 4. Uttarakhand's share in central taxes rose from approximately Rs 11,419 crore in the FY2023 budget to roughly Rs 13,943 crore in the FY2024 budget (Deccan Herald, 2024), an increase the state government has explicitly linked to its disaster-prone geography, and the state's ongoing advocacy, alongside Sikkim and Jammu and Kashmir, for a dedicated green bonus recognising Himalayan forest ecosystem services, examined in Chapter 4.8, represents a parallel bid to convert the state's ecological function into a more durable, formula-based fiscal transfer rather than relying on the project-by-project negotiation the Kumbh funding saga exemplifies.

The Kumbh funding sequence also illustrates a specific asymmetry in how discretionary central assistance is negotiated that this framework's evidence suggests is worth naming directly. Each of the state's successive requests has been announced and negotiated individually rather than through a single, comprehensive Kumbh financing package agreed in advance of the preparation period, meaning the state's implementing departments have had to plan and sequence construction work against a funding pipeline whose total eventual size and timing carried real uncertainty even as the January 2027 event date itself remained fixed. This project-by-project negotiation pattern mirrors, at a larger scale, the same fragmented, committee-by-committee coordination this framework's Chapter 15.1 discussion identified as characteristic of Uttarakhand's inter-departmental administration more broadly.

21.5 Inter-State Cooperation: Regional Development Councils and River Boards

Uttarakhand's inter-state cooperation runs along three channels this framework has examined in earlier chapters and now draws together explicitly. River basin cooperation, examined in Chapter 4.8 and Chapter 10.5, ties the state into the Upper Yamuna River Board alongside Himachal Pradesh, Delhi, Haryana, Rajasthan and Uttar Pradesh, and into cross-border hydropower negotiation with Nepal over the long-delayed Pancheshwar Multipurpose Project, both arrangements in which Uttarakhand's position as an upstream, headwater state gives it influence over downstream water availability that its comparatively small population and economy would not otherwise provide.

Himalayan states' collective advocacy, examined in Chapter 4.8, extends this river-basin cooperation into a broader political coalition: the 2019 Mussoorie Conclave of ten Himalayan states, hosted by Uttarakhand itself, and the state's continued advocacy at NITI Aayog Governing Council meetings for a green bonus recognising shared ecological service provision, represent a form of inter-state cooperation organised around common geographic disadvantage rather than shared river infrastructure.

A third, more recently visible channel is direct state-to-state policy learning through NITI Aayog's own convening function. A one-day Regional Workshop under the State Support Mission was held in Dehradun on 2 June 2025, with V.K. Saraswat, Member, NITI Aayog, Raj Shekhar Joshi, Vice Chairperson, SETU Aayog, Chief Secretary Anand Bardhan, and senior officers from Bihar, Chandigarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Ladakh, Madhya Pradesh, Maharashtra and Punjab participating, with sessions on the role of State Institutions for Transformation and data-driven governance platforms including the NITI for States Portal and the Viksit Bharat Strategy Room (PIB, NITI Aayog, 2025). This venue-hosting role, alongside SETU Aayog's own stated collaborations noted in section 21.1, suggests Uttarakhand's planning institution has positioned itself as an active participant in cross-state institutional learning rather than a passive recipient of centrally designed templates.

The specific composition of states represented at the June 2025 Dehradun workshop is itself informative: alongside larger states such as Gujarat, Maharashtra and Madhya Pradesh, the participant list included several other small hill and Himalayan jurisdictions, Himachal

Pradesh, Jammu and Kashmir and Ladakh among them, suggesting an informal peer group of comparably sized, comparably terrain-constrained states has begun to coalesce around shared institutional transformation questions distinct from, though overlapping with, the Himalayan states' green bonus coalition examined earlier in this section. Whether this planning-institution peer learning translates into concrete policy adoption rather than remaining at the level of workshop-based information exchange is not something this chapter's sources allow it to assess, but the existence of the venue itself represents infrastructure for exactly this kind of transfer that did not exist in comparable form before SETU Aayog's establishment.

21.6 International Collaboration: Common Development Agenda and Global Partnership

Uttarakhand's international engagement takes three distinct forms this framework has documented separately across earlier chapters. The most institutionally significant is the state's direct partnership with the United Nations Development Programme as knowledge partner for the Viksit Uttarakhand at 2047 visioning process described in section 21.1, a relationship that gives the state's long-term planning process access to international development-planning methodology and, implicitly, a degree of external validation and technical credibility beyond what a purely internal government exercise would carry.

Investment-oriented international engagement, examined in Chapter 4.5, has so far taken the form of memoranda of understanding rather than substantially realised foreign direct investment, most visibly the ten MoUs signed with a Netherlands business delegation at the December 2023 Global Investors Summit spanning aviation maintenance, smart mobility and agriculture, following roadshows the Chief Minister conducted in London and Dubai. This framework's Chapter 4.5 assessment, that the state does not yet appear among DPIIT's top state destinations for recorded FDI equity inflows, applies with equal force here: international MoU activity has generated diplomatic and promotional visibility more reliably than it has generated verified capital inflow.

The third channel is cross-border, functional cooperation with Nepal specifically, examined in Chapter 4.8, spanning both the Mahakali Treaty water-sharing framework and the stalled Pancheshwar hydropower project, alongside the less formal but no less real dependence of the state's Char Dham pilgrimage economy on cross-border and international tourist inflows more broadly. Unlike Kerala's or Punjab's international engagement, built substantially around diaspora remittances and labour migration documented in Chapter 20.4, Uttarakhand's international dimension remains comparatively narrow: a single major bilateral water and hydropower relationship with Nepal, an emerging international development-partnership relationship through UNDP, and investment-promotion MoU activity whose conversion rate into realised capital this framework has already flagged as unverified.

This comparative narrowness is worth situating against the state's own stated 2047 ambitions. A genuinely international development agenda, of the kind the Viksit Uttarakhand at 2047 label implicitly invokes by echoing the national Viksit Bharat framing, would in principle

extend beyond investment-promotion roadshows and a single UNDP knowledge partnership toward more systematic technical exchange with comparable mountain jurisdictions elsewhere, Nepal's own hill development agencies, Bhutan's Gross National Happiness-linked planning architecture, or Switzerland's and Austria's alpine regional development institutions, none of which this chapter's sources found evidence of Uttarakhand engaging with directly despite the substantial technical overlap between their development challenges and the ones this framework has documented for Uttarakhand's own hill districts across Chapters 6, 10, 14 and 20.

21.7 Monitoring, Evaluation and Results Framework

The single clearest institutional signal on monitoring and evaluation to emerge from this chapter's research is Chief Secretary Anand Bardhan's own explicit instruction to SETU Aayog to prioritise data-driven district planning to accelerate Uttarakhand's growth, a directive that, if acted upon systematically, would address directly the recurring pattern Chapter 20.6 documented across this entire framework, headline scheme figures that are comprehensively reported nationally and at state level, but hill-versus-plains disaggregated utilisation and verification data that is not. SETU Aayog's own participation in NITI Aayog's national data-driven governance platforms, the NITI for States Portal and the Viksit Bharat Strategy Room referenced in section 21.5, gives the state institutional access to monitoring infrastructure that already exists at the national level; the open question this framework cannot resolve is whether Uttarakhand-specific data feeding into these national platforms is disaggregated finely enough, to the district and hill-versus-plains level specifically, to serve the verification function this framework has found wanting sector after sector.

The 218-signal framework underpinning the Viksit Uttarakhand at 2047 process, described in section 21.1, offers a genuine opportunity to build monitoring directly into the vision document's own structure from the outset, since a signal-based planning architecture, if maintained as the living, periodically reviewed blueprint its designers describe, could in principle track each of the specific implementation gaps this framework has catalogued, Health and Wellness Centre operationalisation in Chapter 6.1, AMRUT service-level improvement plan verification in Chapter 11.4, DMHP fund utilisation in Chapter 6.5, PSU account finalisation arrears in Chapter 4.6, as a discrete, monitored signal rather than allowing these gaps to remain visible only through the kind of independent, cross-sectoral research this framework itself has had to undertake.

A practical design recommendation follows directly from this framework's own methodology across its preceding chapters: each of the roughly 218 signals identified through the June 2025 workshop process could usefully be paired, at the point of publication rather than after the fact, with an explicit statement of the specific data source, collection frequency, and disaggregation level, state, division, or district, that will be used to track it, precisely the metadata this framework's own researchers had to reconstruct chapter by chapter, often unsuccessfully, when attempting to verify headline claims against ground-level delivery. Building this metadata into the Vision Document's initial publication would represent a

meaningfully different approach from the pattern this framework has documented across the Smart Cities Mission, the Global Investors Summit, and the AMRUT programme alike, where headline targets were announced well before the granular verification data needed to assess their delivery became available, if it became available at all.

21.8 Accountability Architecture: Legislature, Civil Society and Citizens

Formal legislative accountability runs through the Uttarakhand Vidhan Sabha's ordinary budget scrutiny and question-hour mechanisms, supplemented by the specific institutional gaps this framework has already documented in Chapter 15, most notably the multi-year vacancy in the state's own Lokayukta ombudsman office, only being addressed through a Search Committee process constituted in June 2026, and a judiciary carrying one of the country's fastest-growing pendency rates over the past decade. Both gaps mean that the formal, legally mandated channels through which citizens and the legislature might hold the executive account for the vision and roadmap commitments examined throughout this chapter are themselves operating below full capacity.

Civil society and independent research have, in practice, supplied much of the verification and accountability function this framework has repeatedly found the state's own formal reporting systems not providing at sufficient granularity: the Dehradun-based Social Development for Communities Foundation's tracking of ghost-village and daily out-migration figures examined in Chapter 20.4, the Naula Foundation's and CHIRAG-CEDAR's independent spring-revival documentation examined in Chapter 10.1, and the investigative reporting on post-summit investment claims examined in Chapter 4.1, together illustrate that a meaningful share of the disaggregated, verification-level evidence this framework has relied on throughout originated outside government channels entirely. This is not, in this chapter's assessment, primarily a criticism of state capacity so much as a description of how accountability actually functions in Uttarakhand at present, a partnership, sometimes cooperative and sometimes adversarial, between government data systems strong on headline reporting and independent civil society and research capacity strong on the granular verification government reporting has not consistently supplied.

Citizen-facing accountability channels, examined at greater length in Chapter 20.7, including the state's Online RTI Portal, the Vigilance Establishment's 1064 helpline, and the panchayat and municipal electoral cycles that continue to deliver strong turnout and, in the case of panchayat elections, among the highest women's representation rates nationally, provide the direct citizen-to-government accountability channels this vision process will depend on for legitimacy over its multi-decade horizon. Strengthening these channels, clearing the Lokayukta vacancy, reducing judicial pendency, extending social audit practice beyond MGNREGA as Chapter 20.7 recommended, and ensuring the Viksit Uttarakhand at 2047 Vision Document's own periodic review process genuinely incorporates citizen and civil society input rather than functioning as an internal government exercise dressed in participatory language, is not a separate item on the state's development agenda but the

precondition for the entire vision and roadmap this closing chapter has examined being something more than an aspirational document.

This framework began, in Chapter 1, with Uttarakhand's basic geographic and demographic profile, and closes here, twenty-one chapters later, with a vision process still very much in formation, its 218 signals prioritised but not yet published as a finished Vision Document, its SETU Aayog still building the partnerships and data systems its own leadership describes as central to its mission, and its Kumbh Mela preparations still mid-negotiation with the Centre as this chapter goes to press. This is, in a real sense, an accurate reflection of where Uttarakhand itself stands: a state with genuine, documented achievements, SDG Index leadership, pioneering gender representation, a strengthening own-revenue base, sitting alongside equally genuine and documented gaps, a hollowing hill interior, an under-resourced judiciary and ombudsman office, a widening fiscal deficit, that this framework has traced consistently rather than selectively. Precisely because the distance between what Uttarakhand announces and what it verifiably delivers has been the single most consistent finding across every chapter of this Standardised Document Format review, the most useful contribution a document of this kind can make is not a further round of ambitious targets but the discipline of measuring the gap itself, chapter by chapter, sector by sector, until it closes.

End Note

The **Comprehensive Development Framework for Uttarakhand** establishes a strategic imperative to balance ambitious economic modernization with the preservation of an inherently fragile Himalayan ecosystem. The state's unique geography offers immense potential in renewable energy, tourism, and organic agriculture, yet this potential remains tightly bound to its ecological vulnerability. Navigating this delicate dynamic requires transitioning from reactive planning to a proactive, science-backed development model that treats environmental stability as the foundation of all economic activity.

A core priority of this framework is addressing the persistent socioeconomic disparity between the plain regions and the upper hill districts. Sustainable progress hinges on curbing distress migration by generating viable, decentralized livelihoods within the interior valleys. This demands targeted investments in high-value horticulture, climate-resilient farming, local artisan supply chains, and community-driven ecotourism that channels revenue directly into local village economies rather than concentrated urban pockets.

Simultaneously, the framework underscores the urgent need for climate-resilient infrastructure, strict carrying-capacity assessments, and enhanced disaster preparedness. Infrastructure projects—including transport corridors and hydropower initiatives—must integrate rigorous geotechnical evaluations and real-time monitoring systems to withstand seismic activity and extreme weather events. Bridging the digital and social divide through expanded telemedicine, decentralized skilling programs, and rural connectivity ensures that public services remain accessible across all terrains.

Ultimately, Uttarakhand's developmental trajectory must not be measured solely by standard macroeconomic indices, but by its institutional resilience, disaster mitigation capabilities, and the enduring well-being of its citizens. By combining environmental stewardship with decentralized governance and targeted economic diversification, this framework serves as a vital blueprint to guide *Devbhoomi* toward an inclusive, sustainable, and self-reliant future.

REFERENCE LIST

- Academia.edu. (2023, November 1). Slum distribution: Case study of Dehradun city.
- Accountability Research Center. (2023, June 8). Social audits in India: Institutionalizing citizen oversight.
- AckoDrive. (2025, July 11). Uttarakhand EV policy 2025 will focus on incentives and developing ecosystem.
- AffairsCloud. (2024, February 1). MoE released All India Survey on Higher Education 2021-22.
- Agrijob. (2026, May 20). Pradhan Mantri Fasal Bima Yojana 2026: Claim & apply.
- Aipankari. (2025, October 4). Uttarakhand handicraft art.
- AirPollution.io. (2026). Air quality in Uttarakhand.
- ANI. (2026). Uttarakhand CM Dhami celebrates youth empowerment.
- ANI. (2026). Uttarakhand committed to Viksit Bharat goal.
- AQI.in. (2026). Dehradun Air Quality Index (AQI), real time air pollution.
- ASER Centre. (2025). ASER 2024 national findings.
- Asian Development Bank. (2023). Uttarakhand climate resilient power system development project.
- Asianet Newsable. (2026, July 25). Aman Verma lauds Uttarakhand's film policy, plans to shoot there.
- Atal Utkrisht GIC Gaindakhal. (2026). About Atal Utkrisht.
- Athrady, A. (2025, September 5). Karnataka tops FDI chart with investments worth Rs 50,000 crore in FY 2024-25. Deccan Herald.
- Azim Premji University. (2025, November 11). Gamechangers: The all-woman Gram Panchayats of Uttarakhand.
- Behanbox. (2025, January 10). Gamechangers: The all-women Gram Panchayats of Uttarakhand.
- Bisht, A. (2023, September 12). Dharmendra Pradhan lays foundation of 142 PM Shri schools, inaugurates Vidya Samiksha Kendra in Uttarakhand. Careers360.
- British Council. (2026, July). All India Survey of Higher Education findings published.
- Bureau of Energy Efficiency. (2024). Impact of energy efficiency measures for the year 2022-23.
- Business Standard. (2024, January 27). OBC reservation commission submits report to CM Dhami at his residence.

Business Standard. (2026, July 17). Jal Jeevan 2.0 must deliver water, not just more tap connections.

Business Today. (2024, July 12). Uttarakhand becomes the top performer in NITI Aayog's SDG India Index 2023-24.

Business Upturn. (2026, June 13). Uttarakhand forms Search Committee for appointment of Lokayukta Chairperson and Members.

Cardekho Trucks. (2020, October 30). Tata Motors Pantnagar plant crosses 50,000 units BS6 vehicle production mark.

Careers360. (2024). AISHE report.

Careers360. (2025). Economic Survey 2024-25.

Careers360. (2025, September 12). UDISE+ analysis, 68 lakh dropouts between 2023-24 and 2024-25, is MoE underestimating dropout rates?

Careers360. (2026, January 15). Uttarakhand Polytechnic 2026 (JEEP), registration, date, result, cutoff, admission process.

CEDA, Ashoka University. (2024, October 29). Here is what NFHS-5 tells us about India.

Census of India Net. (2026). Uttarakhand population 2026, religion, literacy, and census data insights.

Centre for Mental Health Law and Policy. (2026, February 23). Unpacking India's District Mental Health Programme.

Centre for Science and Environment. (2023). Uttarakhand solar policy.

Chettri, S. (2024, January 30). AISHE report, 11 states, UTs see higher education enrolment drop, 3 by over 5%. Careers360.

ClearTax. (2026, June 23). Pradhan Mantri Awas Yojana (PMAY) scheme: Details.

Climate Diplomacy. (2026). Van Gujjars help conserve forests, but are deprived of rights.

Climate Fact Checks. (2025, July 15). Uttarakhand faces surge in extreme climate events, warn scientists.

CollegeDekho. (2025, July 21). Uttarakhand ITI admission 2025, application form, eligibility, trades, merit list, seat allotment.

Collegedunia. (2022, October 16). Education Minister launches NEP 2020 in Uttarakhand for higher education.

Comptroller and Auditor General of India, as reported in Down To Earth. (2026, April 19). Nearly a third of STPs discharge untreated sewage into Ganga in Uttarakhand despite Rs 1,000 crore spend.

Comptroller and Auditor General of India. (2021). Government of Uttarakhand.

Comptroller and Auditor General of India. (2022). Performance audit report on implementation of the 74th Constitutional Amendment Act for the year ended 31 March 2021, Chapter 6: Financial resources of Urban Local Bodies.

Comptroller and Auditor General of India. (2024). Performance audit on public health infrastructure and management of health services for the year ended 31 March 2022, Chapter 5: Healthcare infrastructure.

Comptroller and Auditor General of India. (2025). Chapter 4: Audit observations of State Public Sector Enterprises, Uttarakhand.

Comptroller and Auditor General of India. (2025). Government of Uttarakhand, Report No. 3 of 2025.

Comptroller and Auditor General of India. Audit reports (various years, Fourteenth Finance Commission period).

Construction World. (2022, June 8). Govt sanctions 36 STPs to keep Ganga clean in Uttarakhand.

Construction World. (2026). Uttarakhand seeks timely completion of Rishikesh Karnaprayag rail.

Countercurrents. (2026, June). Shutting the school door, how Uttar Pradesh's merger policy threatens the right to education.

Curly Tales. (2026, February 27). Kedarnath records 21.4 MT solid waste in 2025 Yatra season; highest in 5 years.

Data For India. (2026, April 20). Judicial pendency in India.

Data Player. (2025, August 4). Muslim population in Uttarakhand, 2025 update, district wise data, percentage and analysis.

DD News. (2026, February 24). Haridwar Kumbh 2027: Uttarakhand CM thanks PM Modi for Rs 500 crore Central assistance, says preparations underway on war footing.

Deccan Herald. (2024). Union Budget 2024: CM Pushkar Singh Dhami welcomes budget for extending financial assistance to disaster-prone Uttarakhand.

Deccan Herald. (2025, July 19). MeT dept issues red alert for heavy rainfall in parts of Uttarakhand's Kumaon region.

Department for Promotion of Industry and Internal Trade. (2020). Business Reform Action Plan 2020: States/UTs categorisation. Press Information Bureau.

Department of Drinking Water and Sanitation, Ministry of Jal Shakti. (2024). Year end review.

DHS Program. (2021). National Family Health Survey.

DHS Program. (2025). National Family Health Survey, NFHS-5, India, 2019-21, Uttarakhand fact sheet.

Dialogue Earth. (2024, April 12). Spring revival project in Uttarakhand offers hope against climate change.

Dialogue Earth. (2025, August 25). Himalayan governments must put springs on the agenda.

Directorate General of Employment. (2025). Government of India, Ministry of Labour and Employment, Rajya Sabha starred question reply.

Down To Earth. (2025, June). Illegal sand mining runs rampant in Kosi River, Uttarakhand.

DyaRakoti. (2026). Uttarakhand primary teacher basic recruitment 1649 posts.

DyaRakoti. (2026). Uttarakhand primary teacher special education recruitment.

Dyarakotiuk. (2026, January 29). Uttarakhand primary teacher (basic) recruitment, 1649 posts.

e-IJEP. (2025). Ecological assessment of Asan Conservation Reserve, wetland, in district Dehradun of Uttarakhand.

e-Uttaranchal. (2026). Char Dham Railway Project.

Economic and Political Weekly. (2025, March 8). Examining women's participation in Van Panchayats of Uttarakhand, India.

Econsultancy India. (2025, June 26). DDU-GKY 2.0: EOI 2025-26 by Uttarakhand Government.

Education for All in India. (2026). School education in India, an analysis based on UDISE+ 2021-22 to 2024-25.

Elets eGov. (2026, February 2). Economic growth with sustainability is non-negotiable for Uttarakhand's future.

Engaging Indian States. (2023, December 30). Uttarakhand announces the formation of the State Institute for Empowering and Transforming Uttarakhand (SETU) commission.

ETV Bharat. (2023, October 10). Corbett National Park faces problem of plenty as tiger population soars.

ETV Bharat. (2024, January 24). Uttarakhand Global Investors Summit 2023: 10 MoUs signed between state and Netherlands companies.

ETV Bharat. (2025, August 28). India has over 87,000 active landslide zones, Arunachal, Himachal, Uttarakhand most vulnerable, GSI report.

ETV Bharat. (2026, June 19). Uttarakhand: Pilgrims bring down two tonnes of plastic waste from Kedarnath Dham under Carry Me Back campaign.

euttaranchal.com. (2026, March 14). Haridwar Kumbh Mela 2027 guide: Important dates, latest news, FAQs.

- Factly. (2022, December 8). Data: SRS bulletin highlights the wide variation of MMR across states, Assam's MMR 10 times that of Kerala's.
- FindEasy. (2026, March 8). Uttarakhand population by religion 2026.
- Forest Research Institute Deemed University Dehradun. (2026). Entrepreneurship Development and Incubation Cell.
- Forest Research Institute, Dehradun. (2026). Homepage.
- Forest Survey of India. (2019). India state of forest report 2019, Uttarakhand state chapter.
- Forest Survey of India. (2019). Uttarakhand.
- Forum for State Studies. (2025, October 9). State budgets 2025-26: A data note.
- Garhwal Post. (2023, July 26). Govt replaces State Planning Commission with SETU.
- Garhwal Post. (2024, October 19). Uttarakhand, ascending star of Indian cinema.
- Garhwal Post. (2025, June 5). SETU Aayog hosts regional conference to push Viksit Bharat vision.
- Garhwal Post. (2025, November 15). Kedarnath reels under 2,300-tonne garbage amid record pilgrim footfall.
- Garhwal Post. (2026, January 1). Zero tolerance policy against corruption yielding results: Murugesan.
- GKToday. (2018, April 7). Uttarakhand's second Mega Food Park inaugurated at Udham Singh Nagar.
- GRAAM. (2026, June 22). Counted out, why India's disability data fails the people it should serve.
- Gulf News. (2025). Indian cabinet approves ropeway projects worth Rs 68.11 billion for Hemkund Sahib and Kedarnath in Uttarakhand.
- High Court of Uttarakhand. (2024, December 24). Result of Counsellor in Family Courts of District Almora, Bageshwar, Chamoli, Champawat, Pithoragarh, Rudraprayag, Tehri Garhwal and U.S. Nagar.
- Hindustan Times. (2018, November 30). 15 states have 100% household electrification now, says govt.
- Hindustan Times. (2023, May 28). CM seeks funds for eco services and floating population in state. Pressreader.
- Hindustan Times. (2024). CAG points at errors in budget documents.
- Holidify. (2026). List of 5 airports in Uttarakhand.
- IANS. (2026, May 23). Blue economy: Cold-water fisheries contribute 3 pc of inland fish production.
- IBEF. (2025). Uttarakhand tourism, economy, agriculture, and industries insights.

IBEF. (2026). Uttarakhand State Presentation Report.

ICID-CIID. (2025, September). Adoption of micro-irrigation systems in the Gadarjudda minor canal command area of the Upper Ganga Canal system, Roorkee, Haridwar, Uttarakhand. 4th World Irrigation Forum.

IDR. (2025, June 2). NFHS-5 reveals a rise in malnutrition.

iDream Education. (2025, January 30). ASER 2024 findings, a detailed analysis.

IIM Kashipur. (2026). FIED (Foundation for Innovation and Entrepreneurship Development).

Inc42. (2020). Incubators are driving the startup ecosystem in Uttarakhand.

Inclusion. (2025, October 29). Transformative governance: Uttarakhand leaps to third best state.

India Brand Equity Foundation. (2025). Mission Poshan Abhiyaan.

India Brand Equity Foundation. (2026). Ayushman Bharat: Universal healthcare scheme and key initiatives.

India Briefing. (2024, August 1). SDG India Index 2023-24: Progress on Sustainable Development Goals.

India Data Map. (2026, January 14). Mapping India's water revolution: Which states have achieved 100% piped water coverage?

India Mart. (2015, February 10). Uttarakhand's first MSME policy: Incentives galore.

India TV News. (2023, December 8). UK Global Investors Summit 2023: Development by double-engine govt can be seen in Uttarakhand, says PM Modi.

India TV News. (2025, March 28). Char Dham Yatra 2025: Uttarakhand govt issues health advisory for pilgrims.

IndiaDataMap. (2026). State-wise analysis of higher education enrollment in India.

Indian Infrastructure. (2026). Centre launches Rs 1.30 trillion road infrastructure plan for Uttarakhand.

Indian Journal of Labour Economics. (2020, November 12). Forced out-migration from hill regions and return migration during the pandemic: Evidence from Uttarakhand.

Indian Kanoon. (2025, June 18). Dinesh Kumar Rana vs State of Uttarakhand.

Indian Masterminds Bureau. (2025, September 22). Uttarakhand rises to second in national rankings for secondary education, focus now shifts to strengthening primary schooling.

Indian Masterminds Bureau. (2026, March 30). Uttarakhand budget 2026-27, 1.11 lakh crore focused on youth, women, farmers and inclusive development.

- Indian Masterminds. (2026, February 24). Haridwar Kumbh Mela 2027: Centre releases Rs 500 crore for infrastructure boost, CM Dhami thanks PM Modi.
- Indian Masterminds. (2026, June 3). Uttarakhand EV policy 2026, massive subsidies, tax waivers and charging network push to boost electric mobility.
- Indian PSU. (2026, June 10). Uttarakhand releases Science, Technology and Innovation Policy 2026 to drive research, innovation and self-reliance.
- Indian PSU. (2026, May 14). Uttarakhand to roll out new EV policy soon, 50% of government vehicle purchases to be electric.
- IndiaSpend. (2022). Populating ghost towns.
- Interes Journals. (2025, January 29). Growth of tourism industry in Uttarakhand.
- International Centre for Integrated Mountain Development. (2021). Understanding the Chamoli flood, cause, process, impacts, and context of rapid infrastructure development.
- International Journal for Multidisciplinary Research. (2025, August 5). Assessing the impact of climate change on Uttarakhand's ecology.
- Invest India. (2020). Uttarakhand: Policies and incentives.
- Just Agriculture. (2025, March). Transforming agriculture in Uttarakhand.
- Khanal, S., Shrestha, M., & Bhuchar, S. (2022). Understanding the flash flood event of 7th February 2021 in Rishi Ganga basin, Central Himalaya using remote sensing technique. ScienceDirect.
- Kumar, B. (2026, July 8). When PSUs, fertiliser shops, and flour mills became Uttarakhand's 'investors' after global summit. NewsLaundry.
- Land Conflict Watch. (2024, October 4). Van Gujjars in Uttarakhand fight for legal recognition of forest rights.
- Lawctopus. (2025). An overview of the Uttarakhand Uniform Civil Code.
- Legal Bites. (2023, December 8). Case analysis, Rural Litigation and Entitlement Kendra and others v. State of Uttar Pradesh and others (1985), Dehradun Valley litigation.
- Local Samosa. (2026, May 19). As Uttarakhand empties out into 'ghost villages', communities face loss of culture and traditions, but no solutions.
- Maps of India. (2015, April 9). Uttarakhand catastrophe, part II, post disaster management fiasco.
- Meher Hospital Dehradun. (2025, July 24). Ayushman Bharat scheme in Uttarakhand: How it benefits patients.
- Mercom India. (2023, August 17). Uttarakhand extends generic solar tariff for MSSY projects by three more years.

Mero Uttarakhand. (2026, February 27). Rishikesh-Karnaprayag rail line, complete overview.

Mero Uttarakhand. (2026, May 9). 15 festivals of Uttarakhand that capture its traditions and spirit.

Ministry of Commerce and Industry. (2024, February 3). DPIIT recognises 1,17,254 startups as on 31st December 2023. Press Information Bureau.

Ministry of Fisheries, Animal Husbandry and Dairying. (2024). Year end review 2024: Department of Animal Husbandry and Dairying. Press Information Bureau.

Ministry of Health and Family Welfare. (2021, December). NFHS-5: Uptick in health indicators across India. Press Information Bureau.

Ministry of Home Affairs. (2024, July 30). Reply to Lok Sabha question on Tele-MANAS and suicide prevention.

Ministry of Power. (2023). Indian power sector transformation report.

Ministry of Rural Development. (2024). Targets of Pradhan Mantri Awaas Yojana-Gramin.

Ministry of Rural Development. (2025). Achievement of targets under PMAY-G.

Ministry of Rural Development. (2025). Government on course to achieve targets under rural housing programme.

Ministry of Rural Development. (2025). Status of PMGSY roads.

Ministry of Statistics and Programme Implementation. (2024, September 23). Periodic Labour Force Survey annual report, July 2023 to June 2024.

Nagar Nigam Dehradun. (2016). EoI for HFA (Urban) survey and HFAPoA.

National Centre for Disease Control. (2024). State Action Plan on Climate Change and Human Health, Uttarakhand.

National Health Mission Uttarakhand. (2026). Recruitments: Vacancies of Medical Officer and Specialist as on 02-07-2026.

National Herald. (2023, July 29). Uttarakhand, the crores in the river.

National Informatics Centre Uttarakhand. (2025). Uttarakhand, the land of Gods, is embracing digital transformation.

National Informatics Centre. (2025). Uttarakhand, the land of gods, is embracing digital transformation.

National Informatics Centre. (2025, April). Uttarakhand: e-Governance initiatives report.

National Informatics Centre. (2026). Home, Uttarakhand State Unit website.

National Informatics Centre. (2026). Home-2, Uttarakhand State Unit website.

National Informatics Centre. (2026). Uttarakhand.

- New Kerala. (2026). Uttarakhand's first GI products gallery opens in Haldwani.
- News Articles Net. (2026, June 15). STI Policy 2026: Driving research-led growth in Uttarakhand.
- News on Air. (2024). Relief and rescue operations going on in disaster affected areas of Uttarakhand.
- News on Air. (2025). Pradhan Mantri Gram Sadak Yojana marks 25 years.
- News on Air. (2025). Training sessions underway for govt officials on UCC Portal.
- News on Air. (2025, August 7). 95% of projects under Smart Cities Mission completed, says govt.
- News on Air. (2025, December 27). Parikrama, GI tagged handicraft products bulletin.
- News on Air. (2025, February 8). J&K: Union govt sanctions 338 Anganwadi Centres for upgradation under Mission Saksham Anganwadi and Poshan 2.0.
- News on Air. (2025, January 1). Cabinet approves continuation of PM Fasal Bima Yojana, weather-based crop insurance scheme.
- News on Air. (2025, July 19). Union Minister Amit Shah to attend 'Uttarakhand Nivesh Utsav' in Rudrapur.
- News on Air. (2025, July 29). Uttarakhand first state to implement NEP 2020, says CM Dhami.
- News on Air. (2026, February 11). Uttarakhand govt intensifies preparations for Char Dham Yatra.
- News on Air. (2026, March 17). Uttarakhand govt introduces 'e-Swasthya Dham' for real-time health monitoring during Char Dham Yatra.
- Newstak. (2025, November 17). Char Dham Yatra garbage issue.
- Nickled and Dimed. (2025, January 20). Unlocking the potential of PM POSHAN.
- NITI Aayog. (2022, March). State Nutrition Profile: Uttarakhand (No. 88).
- OB News. (2026, February 5). Uttarakhand CM Dhami disburses pension, boosts social security system.
- OpenGov Asia. (2026, May 23). Cold water fisheries emerging as a key pillar of India's blue economy.
- Organiser. (2025, July 12). Namami Gange Mission: Haridwar strengthens Ganga clean-up with two modern sewage treatment plants.
- Ornate Solar. (2024). Uttarakhand solar energy policy.
- Ornate Solar. (2026, June 19). Uttarakhand solar energy policy, tariff update.
- Outlook India. (2022, March). Women representation goes up in Uttarakhand assembly, but a long way to go.

Outlook India. (2024). No EVMs, no polling parties sent to 1564 Uttarakhand's ghost villages.

Outlook India. (2026, February 1). Union Budget 2026: Himachal Pradesh seeks Rs 50,000 crore green fund.

Outlook India. (2026, January 19). Uttarakhand awarded 'Leader' status in Startup India ranking.

Parthiban, A. (2025, August 28). UDISE+ 2024, school enrollment drops by 11 lakh with secondary retention at 47 percent, teachers cross 1 crore. Careers360.

Pharma Choices. (2026, March 2). Full list of pharmaceutical companies in Uttarakhand.

PIB, Ministry of Tourism. (2024, November 25). PRASHAD scheme: List of identified and sanctioned projects.

PIB, NITI Aayog. (2025, June 3). NITI Aayog organised a Regional Workshop on State Support Mission in collaboration with SETU Aayog held in Uttarakhand, Dehradun.

PIB. (2018, April 7). Union food processing minister Harsimrat Kaur Badal inaugurates Uttarakhand's second mega food park at Udham Singh Nagar.

PIB. (2018, February 28). 31 sewage management projects worth Rs 1024.5 crore under execution in Uttarakhand.

PIB. (2025, August 12). Additional 1.47 lakh houses approved under PMAY-U 2.0.

PIB. (2025, February 18). Pradhan Mantri Fasal Bima Yojana turns nine.

Pioneer Edge. (2025, July 21). UPCL reports consistent decrease in AT&C losses.

Policy Circle. (2024, August 28). Industrial parks: Govt must take lessons from its failed SEZ experiment.

PopulationU. (2026). Uttarakhand population 2025/2026.

Power Line Magazine. (2023, March 9). UJVNL, driving hydropower growth in Uttarakhand.

PR Wire India. (2025, May 29). Government of Uttarakhand launches Mega Industrial and Investment Policy 2025 to boost large-scale manufacturing and employment.

Press Information Bureau. (2025). Char Dham All Weather Road Project.

Press Information Bureau. (2026). Release of SDG India Index 2023-24.

Press Reader, Hindustan Times. (2026, April 18). How women voters emerge as major political force in the Himalayan state.

Press Trust of India. (2023, January 2). Uttarakhand CM Dharam Singh launches smart classroom project set to reach over 11,000 schools. Careers360.

- Press Trust of India. (2025, February 10). Enrollment in higher education, Tamil Nadu, Himachal, Uttarakhand, Kerala emerge top achievers. Careers360.
- Press Trust of India. (2025, September 8). Uttarakhand govt to recruit 300 doctors, dismisses 56 absent bond-holding doctors: Minister.
- Pressreader/Hindustan Times. (2021, August 11). NGO recycles 6,772 tonnes of plastic waste in Doon in 3 yrs.
- PRS Legislative Research. (2024). Demand for grants 2024-25 analysis: Housing and Urban Affairs.
- PRS Legislative Research. (2024). Uttarakhand Budget Analysis 2024-25.
- PRS Legislative Research. (2025). Uttarakhand Budget Analysis 2025-26.
- PRS Legislative Research. (2026). Uttarakhand Budget Analysis 2025-26.
- PRS Legislative Research. (2026). Uttarakhand Budget Analysis 2026-27.
- PW Live. (2025). Districts of Uttarakhand.
- PwC. (2023, April 27). An overview of Uttarakhand Startup Policy 2023.
- Railway News. (2025). Rishikesh-Karnaprayag Railway: 2026 construction update.
- Railway News. (2025, November 27). Rishikesh-Karnaprayag railway, 2026 construction update.
- Ramsar Convention Secretariat. (2010). Information sheet on Ramsar wetlands, Asan Conservation Reserve, site no. 2437.
- Record of Law. (2025, November 27). Rural Litigation and Entitlement Kendra, Dehradun and others v. State of Uttar Pradesh and others, 1985 AIR 652.
- Reporters' Collective. (2025, March 5). Uttarakhand government outsources policing, royalty collection from riverbed miners to private players.
- RES Governance. (2025, February 7). Trends in finances for Jal Jeevan Mission.
- ResearchGate. (2021). Soil erosion under different slope classes in Uttarakhand, geospatial evaluation of soil degradation in western Himalayan basins, a case study for Alaknanda basin.
- ResearchGate. (2025, November 7). The Chamoli earthquake, Garhwal Himalaya, field observations and implications for seismic hazard.
- Rural Development Department Uttarakhand. (2026). Homepage.
- Rural India Online. (2024). Annual Status of Education Report (rural) 2024.
- ScienceDirect. (2003). Regional imbalances and sustainable crop farming in the Uttaranchal Himalaya, India.
- ScienceDirect. (2021). Geospatial modelling of soil erosion and risk assessment in Indian Himalayan region, a study of Uttarakhand state.

- ScienceDirect. (2024, December 30). Deciphering Uttarakhand's human efforts towards the ecology through Gross Environment Product (GEP) calculations.
- ScienceDirect. (2026). Coupled analysis of hydroclimatic variability, land use land cover change, and socio-economic adaptation in Uttarakhand using integrated remote sensing and GIS techniques.
- Scribd. (2011). MGNREGA social audit guidelines.
- Scribd. (2026). Atal Awasiya Vidyalaya recruitment 2025.
- Scribd. (2026). Uttarakhand Budget 2025-26 overview.
- Scroll.in. (2018, September 17). Uttarakhand landslides, state risks farming loss as its soil erodes at an alarming rate.
- SDC Foundation. (2024, July 26). Explained: Uttarakhand's top performance in SDG Index.
- Serials Journals. (2018). Disaster rehabilitation in the hill state, Uttarakhand, India.
- Shankar IAS Parliament. (2024, December 24). India State of Forest Report 2023.
- Shukla, S. (2025, July 10). UTET 2025 registration begins for primary, upper primary teacher recruitment in Uttarakhand. Careers360.
- Singh Uday Blog. (2026, February 14). Scheduled castes of Uttarakhand.
- Singh, P., & Bhogal, S. (2021). Interrogating the MSP regime, farm laws and agrarian future in India. *Agrarian South: Journal of Political Economy*.
- SmartSchool Education. (2026, April 21). Government of Uttarakhand partners with SmartSchool Education Limited for digital classrooms.
- Social Development for Communities Foundation. (2024). Workshop, how can we make Uttarakhand climate resilient?
- SolarClue. (2025, July 29). Uttarakhand solar subsidy 2025, save big on solar now.
- Sonisvision. (2024, October 4). Uttarakhand makes history, receives GI tags for 18 products in a single day.
- South Asia Network on Dams, Rivers and People. (2020, May 2). Uttarakhand riverbed mining 2020, rivers, people, revenue robbed.
- SPM IAS Academy. (2025, February 10). A decade of UJALA, illuminating India's path to energy efficiency.
- Springer Nature. (2021). Assessment of irrigation requirement and scheduling under canal command area of Upper Ganga Canal using CropWat model. *Modeling Earth Systems and Environment*.
- Springer Nature. (2026, March 16). Water issues in small and seasonal transboundary rivers and aquifer systems across Bihar, India and Nepal.

- Square Foot Investor. (2025, August 1). Uttarakhand Investment Summit 2025: Know before you invest.
- Square Yards. (2026, March 25). Dehradun Smart City: Objective, projects, current status.
- SRHU. (2025, November 15). Policy for bio-medical waste management.
- Startup India. (2026). Uttarakhand.
- StatisticsTimes.com. (2026). Uttarakhand population 2026.
- Supreme Court Observer. (2024, April 9). High Court vacancies remain unaddressed; only three out of 25 functioning at full strength.
- Swarajya. (2019, July 29). Uttarakhand: Ten Himalayan states demand green bonus, separate ministry at Centre in Mussoorie conclave.
- Swarajya. (2026). Uttarakhand's Rishikesh-Karnaprayag rail project hits 72 per cent physical progress.
- Swarajya. (2026, January 30). Uttarakhand's Rishikesh-Karnaprayag rail project hits 72 per cent physical progress, over Rs 26,841 crore spent so far.
- TaxGuru. (2025, October 7). Uttarakhand Mega Industrial and Investment Policy 2025: Key incentives.
- Tehri Garhwal. (2025, August 22). Traditional art of Uttarakhand, explore Aipan, woodcarving and crafts.
- The Logical Indian. (2026, June 19). Uttarakhand declared fully literate state as literacy rate rises to 98.7 percent under ULLAS mission initiative.
- The Mooknayak. (2023). Ghost villages, abandoned lives.
- The News Mill. (2026). Uttarakhand development projects worth Rs 2 lakh crore.
- The News Mill. (2026, May 9). Uttarakhand allocates Rs 256 crore for development and Kumbh Mela 2027 infrastructure.
- The News Minute. (2025, October 1). NCRB data records a 9.2% rise in crimes against children in 2023.
- The Print. (2022, February 10). How Uttarakhand's pretty hill hamlets with blue skies & rolling greens became ghost villages.
- The Print. (2022, June 5). Uttarakhand: 36 sewage treatment plants to make Ganga pollution-free.
- The Print. (2025, March 1). Less than 50% of 46 projects sanctioned under tourism ministry's PRASHAD scheme completed in 10 years.
- The Print. (2026, July). The long wait for justice begins with an empty judge's chair: 23% posts in district and high courts vacant.

The Secretariat. (2024, August 14). Central government facing acute shortage of IAS officers to fill key posts.

The Secretariat. (2026, April 19). 6 IAS officers transferred in Uttarakhand.

The Secretariat. (2026, April 9). UP faces massive shortage of IAS officers.

The Statesman. (2026, April 4). Uttarakhand seeks Rs 750 crore Central aid for Phase-I preparations of Kumbh 2027.

The Travel It. (2025, August 19). Cultural festivals in Uttarakhand.

The Tribune. (2026, April 21). Wildlife panel rejects Uttarakhand's 19 mining proposals in ESZs of Rajaji, Benog sanctuaries.

The Week. (2025). Hill to hi-tech.

The Wire. (2025, June 18). In Uttarakhand, Van Gujjars battle decades of silencing as state pushes them to the brink.

Toprankers. (2025, May 21). Uttarakhand Judiciary Vacancy 2025.

Tourism India Online. (2025, July 25). India tourism on alarm call, decline in foreign tourist arrival and GDP contribution, IATO sounds alarm for 2025.

Travel and Tour World. (2025). India's Uttarakhand charts a new path.

Travel And Tour World. (2025, October 27). Uttarakhand tourism thrives with more than twenty crore visitors in the last three years, boosting their economy through its pilgrimage and adventure tourism growth.

Tribune India. (2015, August 22). 15% rise in elephant count.

Tribune India. (2024). Uttarakhand sees 74% rise in forest fires, worst hit in country.

Tribune India. (2026). Decline in rate of migration from Uttarakhand.

Tribune News Service. (2022, August 22). Uttarakhand gears up to host Global Investors Summit 2023.

Tribune News Service. (2023). Uttarakhand CM Pushkar Dhami launches logo, website of Global Investors Summit.

UK Digital. (2020, December 21). Folk dances of Uttarakhand and their costumes.

UNA-UK. (2014, June 19). Post flood relief and rehabilitation work in the Himalayas, an NGO perspective.

United Nations Development Programme. (2025, June 16). Signal Prioritization Workshop for Viksit Uttarakhand @2047 Vision.

UPES. (2026). UPES Centre for Innovation and Entrepreneurship.

UPSC Tree. (2021, January 20). Environment, Asan, Uttarakhand's first Ramsar site.

Utkarsh. (2025, March 6). Two ropeway projects in Uttarakhand under Parvatmala project approved.

- Uttarakhand Board of School Education. (2026). Teacher Eligibility Test and DEIED guidelines.
- Uttarakhand Electricity Regulatory Commission. (2025, April 29). Renewable purchase obligation and energy storage obligation regulations.
- Uttarakhand Electricity Regulatory Commission. (2025, December 26). Inviting comments on the petition for true up for FY 2024-25 and annual performance review for FY 2025-26 and determination of tariff for FY 2026-27.
- Uttarakhand PCS Exam Notes. (2025, November 4). Elucidate Uttarakhand's major crops, regional patterns, and challenges impacting cropping intensity and diversity.
- Uttarakhand PCS Notes. (2025). On the basis of NFHS 2019-21 survey.
- Uttarakhand Police, ANI/Newkerala. (2026, July 10). Making border security more modern, better coordinated, people-centric.
- Uttarakhand Pollution Control Board. (2025). Air quality data, Uttarakhand Pollution Control Board.
- Uttarakhand Pollution Control Board. (2025). Home: Notices and registrations.
- Uttarakhand Rural Road Department Agency. (2026). Homepage.
- Uttarakhand Space Application Centre. (2026). Homepage.
- Uttarakhand State Disaster Management Authority. (2025). Departmental Disaster Management Plan.
- Uttarakhand State Disaster Management Authority. (2025, April 4). Chief Secretary reviewed the functions of the Disaster Management Department.
- Uttarakhand State Disaster Management Authority. (2026). Homepage.
- UttarakhandTrip. (2026). Dehradun Airport, Jolly Grant.
- Vajiram and Ravi. (2026, May 19). Mega Food Parks: Scheme, objectives, list in India, components.
- Vyasa Integrated Healthcare. (2026). NFHS-5 vs NFHS-6: State-wise comparison and analysis (all 36 states/UTs).
- Wikipedia. (2026). 2025 Uttarakhand local elections.
- Wikipedia. (2026). Education in Uttarakhand.
- Wikipedia. (2026). Forest cover by state in India.
- Wikipedia. (2026). Indian Council of Forestry Research and Education.
- Wikipedia. (2026). Viksit Bharat-Guarantee for Rozgar and Aajeevika Mission Gramin Act 2025.
- Yes! Magazine. (2023, August 2). Indian villages revive ancient water practices.

Adani Enterprises. (n.d.). Adani Enterprises receives LoA for the prestigious ropeway project between Sonprayag and Kedarnath. Adani Group Newsroom.

Agriculture Institute. (n.d.). Understanding the Agricultural Produce Market Committee (APMC) system.

Asian Development Bank. (n.d.). 38272-045: Uttarakhand Integrated and Resilient Urban Development Project, Additional Financing.

Business Standard. (n.d.). What is the PM-SHRI scheme?

Careers360. (n.d.). 249 universities in 5 years, AISHE data on private, central university, government, SC, ST, women enrolment.

Census 2011 India. (n.d.). Uttarakhand population 2026: Sex ratio and literacy rate.

Census of India.net. (n.d.). Uttarakhand population 2026: Religion, literacy, and census data insights.

Cretum Advisory. (n.d.). Uttarakhand MSME policy.

Daksh India. (n.d.). Court case pendency in India: High Court and subordinate data.

Department of Fisheries, Government of Uttarakhand. (n.d.). Homepage.

Department of Higher Education, Government of Uttarakhand. (n.d.). Devbhoomi Udyamita Yojana brochure.

Devex. (n.d.). Uttarakhand State Disaster Management Authority.

Directorate of Economics and Statistics, Government of Uttarakhand. (n.d.). About us.

Directorate of Economics and Statistics, Government of Uttarakhand. (n.d.). Estimates of state domestic product of Uttarakhand.

Directorate of Technical Education Uttarakhand. (n.d.). Directorate of Technical Education Uttarakhand, Srinagar Garhwal.

Forest Department Uttarakhand. (n.d.). State Climate Change Center, Uttarakhand.

Government Schemes India. (n.d.). Uttarakhand old age pension scheme.

Govt Schemes India. (n.d.). Atal Ayushman Uttarakhand Yojana.

GovtBudget.com. (n.d.). Uttarakhand State Budget 2024-25: Analysis & charts.

ICAR. (n.d.). Uttarakhand.

IJRASET. (n.d.). Youth and skill development in Uttarakhand.

India.gov.in. (n.d.). Rescue and relief in Uttarakhand.

Invest Uttarakhand. (n.d.). Uttarakhand Film Development Council.

Jvs-nwp.org.np. (n.d.). Troubled transboundary cooperation in South Asia.

Ministry of Culture. (n.d.). Intangible cultural heritage.

Ministry of Education, Samagra Shiksha. (n.d.). Inclusive education for children with special needs.

Ministry of Power, Press Information Bureau. (n.d.). Saubhagya electrification scheme, a total 2.86 crore households have been electrified.

Minority Welfare Uttarakhand. (n.d.). Minority Vikas Nidhi scheme.

Nagar Nigam Rishikesh. (n.d.). Atal Ayushman Uttarakhand scheme.

National Government Services Portal. (n.d.). Cyber Crime Complaint Registration by Uttarakhand Police under CCTNS Project.

National Institute of Health and Family Welfare. (n.d.). State brief: Uttarakhand.

NFSSM Alliance. (n.d.). Uttarakhand: State stories.

NITI Aayog. (n.d.). Sustainable development in the Indian Himalayan region.

PIB. (n.d.). National Heritage City Development and Augmentation Yojana.

Press Information Bureau. (n.d.). 75 percent of villages across the country achieve ODF Plus status: Union Minister.

Press Information Bureau. (n.d.). Schemes towards access to schools by disabled children.

Prime Minister of India. (n.d.). Amendments in the Central List of Other Backward Classes, OBCs, in respect of the two states, Gujarat and Uttarakhand.

PTCUL. (n.d.). PTCUL at a glance. Power Transmission Corporation of Uttarakhand Limited.

Recykal. (n.d.). Transforming waste management in Uttarakhand: The Char Dham success story.

ResearchGate. (n.d.). Cultivation of medicinal plants in Uttarakhand.

Sanskriti IAS. (n.d.). Jal Jeevan Mission: From tap coverage to functional water security in rural India.

Scribd. (n.d.). AISHE 2020-21 report summary.

Secretariat Administration Department, Uttarakhand. (n.d.). Profile.

Sharma, V. (n.d.). Nepal's Sharda river may revive Yamuna. The Tribune.

SIDCUL Industries. (n.d.). Tata Motors Ltd. Rudrapur, Pantnagar, Uttarakhand.

SIIDCUL. (n.d.). Welcome to State Infrastructure Industrial Development Corporation Uttarakhand Ltd.

StartupFlora. (n.d.). Uttarakhand government loan schemes for startups and MSMEs.

State Climate Change Cell Uttarakhand. (n.d.). Organization.

Swachh Bharat Mission (Gramin), Department of Drinking Water and Sanitation. (n.d.). FAQs- SBM Phase I.

Swajal Uttarakhand. (n.d.). Swachh Bharat Mission (Gramin).

Tata Sustainability Group. (n.d.). Disaster response, Uttarakhand.

Tnpsctheruvupettagam. (n.d.). Atal Ayushman Uttarakhand Yojana.

Town and Country Planning Department, Uttarakhand. (n.d.). Urbanization in Uttarakhand.

Travel Setu. (n.d.). Dance forms of Uttarakhand, a movement through tradition.

Tribune News Service. (n.d.). 16 Punjab cities among 40 identified for AMRUT.

Tribune News Service. (n.d.). Sex ratio set to fall around 800 in U'khand: Study.

Tribune News Service. (n.d.). State short of 37 IAS officers.

Tribune News Service. (n.d.). State: People yet to benefit from urban sector projects.

Tribune News Service. (n.d.). Vibha Sharma: Nepal's Sharda river may revive Yamuna.

UNESCO World Heritage Centre. (n.d.). Nanda Devi and Valley of Flowers National Parks.

Urban Development Department, Uttarakhand. (n.d.). AMRUT.

UREDA. (n.d.). Efficient use of energy and its conservation.

Utsav.gov.in. (n.d.). International Yoga Festival.

Uttarakhand Academy of Administration. (n.d.). About UAOA.

Uttarakhand Cooperative Department. (n.d.). Promotion of trout farming.

Uttarakhand Forest Department. (n.d.). Medicinal and aromatic plants.

Uttarakhand Handloom and Handicraft Development Council. (n.d.). Uttarakhand Handloom and Handicraft Development Council.

Uttarakhand Palayan Aayog. (n.d.). Palayan Aayog report.

Uttarakhand Urban Sector Development Agency. (n.d.). Slum improvement.

Uttarakhand Urban Sector Development Investment Program. (n.d.). Project overview.

VCSG Uttarakhand University of Horticulture and Forestry. (n.d.). Institute of Medicinal & Aromatic Plants, Gairsain.

Wikipedia. (n.d.). 1991 Uttarkashi earthquake.

Wikipedia. (n.d.). 2025 Nainital child sexual assault case.

Wikipedia. (n.d.). 2025 Uttarakhand flash flood.

Wikipedia. (n.d.). Anil Prakash Joshi.

Wikipedia. (n.d.). Economy of Uttarakhand.

Wikipedia. (n.d.). List of agencies of the government of Uttarakhand.

Wikipedia. (n.d.). List of chief secretaries of Uttarakhand.

Wikipedia. (n.d.). List of cities in Uttarakhand by population.

Wikipedia. (n.d.). List of departments of the government of Uttarakhand.

Wikipedia. (n.d.). List of Scheduled Castes in Uttarakhand.

Wikipedia. (n.d.). List of Scheduled Tribes in Uttarakhand.

Wikipedia. (n.d.). List of special economic zones in India.

Wikipedia. (n.d.). Nanda Devi Raj Jat.

Wikipedia. (n.d.). NITI Aayog.

Wikipedia. (n.d.). Provincial Civil Service (Uttarakhand).

Wikipedia. (n.d.). Smart Cities Mission.

Wikipedia. (n.d.). State Disaster Response Force (Uttarakhand).

Wikipedia. (n.d.). Uttarakhand Metro.

Wikipedia. (n.d.). Uttarakhand Police.

Wikipedia. (n.d.). Uttarakhand Power Corporation Limited.

Wikipedia. (n.d.). Uttarakhand State Authority for Minority Education.