



DEPARTMENT OF GEOGRAPHY  
SHIVAJI COLLEGE  
UNIVERSITY OF DELHI

# SHIVALIK

EDITION-2026

ENVIRONMENTAL DEGRADATION IN THE  
ERA OF DEVELOPMENT: CHALLENGES  
AND SUSTAINABLE ALTERNATIVES



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**DR. USHA RANI**  
CO-EDITOR

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# WORDS FROM THE CHAIRMAN



*Dear Esteemed Faculty Members, Students, Alumni and Readers,*

The Shivalik Geo-Fest and National Seminar 2026, centred on the theme “Environmental Degradation in the Era of Development: Challenges and Sustainable Alternatives,” is both timely and significant, particularly in the context of the United Nations Decade on Ecosystem Restoration. At a time when the world is navigating a phase of volatility, uncertainty, complexity, and ambiguity, environmental concerns have emerged as one of the most pressing global challenges. Climate change, ecological degradation, and the crossing of planetary boundaries signal the urgency of rethinking development paradigms.

India’s intellectual and cultural traditions have long emphasised harmony with nature, as reflected in ancient texts and reinforced through constitutional provisions and environmental legislation. These principles remain highly relevant today as the world grapples with sustainability concerns. The fragile ecosystems of the Himalayas, often referred to as the “Third Pole,” further highlight this urgency. Recent environmental disasters and increasing climate vulnerabilities in the region underscore the need for immediate and sustained conservation efforts.

In this context, the Geo-Fest and Seminar serve as vital platforms for fostering academic dialogue, critical thinking, and interdisciplinary engagement. By bringing together scholars, students, and experts, the event aims to encourage meaningful discussions on biodiversity conservation, climate resilience, and sustainable development strategies. Alongside this, Shivalik’s Geo-Fest promotes youth participation through diverse academic and co-curricular activities, nurturing innovation and intellectual exchange.

The annual Shivalik magazine stands as a reflection of the institution’s academic vibrancy and commitment to environmental consciousness. It not only documents scholarly perspectives but also inspires readers to engage with contemporary challenges thoughtfully. Overall, this initiative reinforces the need for integrated approaches, combining policy, technology, and community participation, to build a sustainable and resilient future.

Prof. B.W. Pandey  
Chairman, Governing Body  
Shivaji College  
University of Delhi

# From the Principal's Desk



प्रिय पाठकों,

‘शिवालिक मैगज़ीन 2026’ का प्रकाशन भूगोल विभाग के शैक्षणिक उत्साह, बौद्धिक जिज्ञासा और रचनात्मक अभिव्यक्ति का एक सराहनीय उदाहरण है। भूगोल केवल पृथ्वी के भौतिक स्वरूप का अध्ययन भर नहीं है, बल्कि यह प्रकृति, समाज और विकास के मध्य गहरे अंतर्संबंधों को समझने की एक व्यापक एवं संवेदनशील दृष्टि प्रदान करता है। वर्तमान समय में, जब विश्व तीव्र पर्यावरणीय परिवर्तनों, संसाधनों के दबाव और सतत विकास की चुनौतियों का सामना कर रहा है, तब ऐसे शैक्षणिक विमर्श और शोधपरक प्रयास अत्यंत महत्वपूर्ण हो जाते हैं।

मुझे विश्वास है कि इस पत्रिका में सकलित लेख, शोध-आधारित अध्ययन, अनुभव और विचार पाठकों को अपने परिवेश के प्रति अधिक सजग बनाएँगे तथा उन्हें समसामयिक भू-पर्यावरणीय मुद्दों पर गंभीरता से विचार करने के लिए प्रेरित करेंगे। साथ ही, यह पत्रिका विद्यार्थियों में जिज्ञासा, आलोचनात्मक सोच और ज्ञान के प्रति निरंतर खोज की भावना को भी सुदृढ़ करेगी।

यह भी अत्यंत हर्ष का विषय है कि इस प्रकार की शैक्षणिक पत्रिकाएँ विद्यार्थियों को अपनी अभिव्यक्ति और शोध क्षमता को विकसित करने का अवसर प्रदान करती हैं। ऐसे प्रयास न केवल अकादमिक वातावरण को समृद्ध करते हैं, बल्कि ज्ञान के प्रति सकारात्मक दृष्टिकोण और बौद्धिक संवाद को भी प्रोत्साहित करते हैं।

मैं इस महत्वपूर्ण प्रकाशन के लिए भूगोल विभाग के समस्त संकाय सदस्यों एवं विद्यार्थियों को हार्दिक बधाई देता हूँ। मुझे पूर्ण विश्वास है कि ‘शिवालिक’ आने वाले वर्षों में भी ज्ञान, शोध और रचनात्मकता का सशक्त मंच बनकर अपनी विशिष्ट पहचान बनाए रखेगी।

आप सभी के उज्ज्वल भविष्य के लिए मेरी हार्दिक शुभकामनाएँ।

“विचारों की स्वतंत्रता ही सृजन की जननी है।”

-सूर्यकांत त्रिपाठी 'निराला'

Prof. Virender Bhardwaj  
Principal  
Shivaji College  
University of Delhi

# MESSAGE FROM THE HEAD OF THE DEPARTMENT



*Dear Esteemed Faculty Members, Students, Alumni and Readers,*

I extend my sincere congratulations to the students and faculty of the Department of Geography, Shivaji College, on the successful organisation of Shivalik Geo-Fest and National Seminar 2026. The theme, “*Environmental Degradation in the Era of Development: Challenges and Sustainable Alternatives*” is both timely and significant, highlighting the urgent need to rethink development paradigms in the face of climate change, biodiversity loss, and growing ecological imbalances across the globe.

The Department has consistently upheld a strong tradition of academic excellence, fostering critical thinking, research aptitude, and a deep sense of environmental responsibility among its students. Over the years, it has created an intellectually stimulating environment that encourages inquiry, innovation, and interdisciplinary engagement. Events such as this Geo-Fest and Seminar serve as dynamic platforms for dialogue, enabling students and scholars to engage with contemporary challenges, exchange ideas, and develop meaningful, solution-oriented perspectives.

I commend the organising team, faculty members, and students for their dedication, coordination, and tireless efforts in making this event a success. Their commitment reflects the spirit of excellence and teamwork that defines the Department.

I am confident that this initiative will generate insightful discussions and inspire participants to contribute meaningfully towards building a more sustainable, inclusive, and resilient future. I extend my best wishes for the continued success of this endeavour and for all future initiatives of the Department of Geography.

Prof. Subhash Anand  
Head of the Department  
Department of Geography  
Delhi School of Economics  
University of Delhi

# From the Office of the Vice-Principal



*Dear Readers,*

There is something profoundly humbling about studying Geography, it reminds us that we are both observers of the Earth and participants in its unfolding story. Shivalik 2026 is not just a magazine; it is a reflection of young minds engaging thoughtfully with the world around them.

As Yi-Fu Tuan beautifully said, "*Place is security, space is freedom,*" capturing the essence of Geography as an exploration of both location and lived experience. In these pages, you will find more than academic exercises. You will encounter reflections shaped by curiosity, concern, and a deepening awareness of the fragile balance that sustains our world.

At a time when the relationship between humanity and nature is being constantly tested, it

becomes essential for us to pause, reflect, and respond with sensitivity. The voices captured in this edition do precisely that, they question, they explore, and most importantly, they care.

I extend my heartfelt congratulations to the students and faculty whose dedication, creativity, and collaborative spirit have made this edition possible. I hope this edition inspires you to look at the world a little more thoughtfully, to notice patterns where there seemed to be none, to ask questions where there was silence, and to recognise your own place within this vast and interconnected system.

May Shivalik 2026 stay with you not just as something you read, but as something you feel and carry forward.

"Human beings not only occupy space, but also interpret and give meaning to it."

-Yi-Fu Tuan

Prof. Tejbir Singh Rana  
Vice-Principal  
Shivaji College  
University of Delhi



# OUR DEPARTMENT



**PROF. TEJBIR SINGH RANA**  
(VICE PRINCIPAL)



**DR. PREETI TEWARI**



**DR. RAJENDER SINGH**



**DR. PRABUDDH K. MISHRA**



**DR. AMIT KUMAR  
SRIVASTAVA**



**DR. BHARAT RATNU**



**DR. USHA RANI**



**DR. MUKESH K.  
MEENA**



**MR. SUNIL JAISWAL**



# FOREWORD BY THE TEACHER-IN-CHARGE



DR. AMIT KUMAR SRIVASTAVA

Assistant Professor  
Department of Geography  
Shivaji College  
University of Delhi

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*Dear Students and Esteemed Readers,*

It is a matter of great pride and pleasure to present Shivalik Magazine 2026, a collective reflection of the curiosity, creativity, and academic engagement of the students and faculty of the Department of Geography. Much like the Shivalik ranges that stand as silent witnesses to the evolving landscapes of our subcontinent, this magazine represents layers of ideas, observations, and explorations shaped through learning, field experiences, and thoughtful inquiry.

Geography teaches us to read the Earth as a living text, where landscapes narrate histories, environments reflect

human choices, and every place carries a story waiting to be understood. The contributions in this volume capture this spirit of exploration through thoughtful articles, reflections, and field experiences.

I commend the editorial team and all contributors for their dedication and enthusiasm in bringing out this publication. I hope Shivalik inspires readers to look at the world with curiosity, responsibility, and a deeper geographical imagination.

Best wishes!!

# FOREWORD BY THE STUDENT ADVISOR



## DR. USHA RANI

Assistant Professor  
Department of Geography  
Shivaji College  
University of Delhi

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### *Dear Students and Esteemed Readers,*

It is with immense pleasure that I welcome you to SHIVALIK'26, a magazine that reflects the intellectual vibrancy and creative spirit of our department. As the Student Advisor, it has been truly rewarding to witness the enthusiasm, curiosity, and dedication with which our students engage in both academic inquiry and creative expression.

More than a publication, SHIVALIK'26 is a mosaic of ideas, perspectives, and aspirations. Each page carries the imprint of inquisitive minds that question, explore, and articulate their understanding of the world. The contributions featured here

Geography teaches us to read the Earth as

a living text, where landscapes narrate histories, environments reflect highlightnot only talent and originality but also the collaborative spirit that strengthens our academic community.

I extend my heartfelt appreciation to every student and contributor who has shaped this edition with their insight and creativity. I also thank our readers for their continued encouragement and engagement.

May this issue inspire thoughtful reflection, spark meaningful conversations, and celebrate the boundless potential within our department.

# LETTER *from the* EDITORS

The release of Shivalik Magazine 2026 marks yet another milestone in our journey of academic exploration, creativity, and collective expression. As a platform shaped by the ideas and efforts of students and faculty, this edition reflects the diverse perspectives, critical insights, and intellectual curiosity that define the Department of Geography.

In a world that is constantly transforming, geography enables us to interpret these changes through a spatial and analytical lens. The articles, reports, and reflections featured in this volume engage with contemporary themes ranging from environmental challenges to technological advancements, encouraging readers to think beyond the obvious and

question the dynamics shaping our surroundings. This magazine is not merely a compilation of written pieces, but a space where ideas converge, experiences are shared, and voices are heard. It showcases the enthusiasm of young geographers who are not only observing the world but also striving to understand and contribute to it meaningfully.

We extend our sincere gratitude to all contributors, editors, and supporters who have worked diligently to bring this publication to life. We hope that Shivalik continues to inspire thoughtful dialogue, nurture creativity, and foster a deeper engagement with the discipline of geography.

**DR. PRABUDDH K.MISHRA**  
**EDITOR**

**DR. BHARAT RATNU**  
**EDITOR**

**DR. USHA RANI**  
**CO-EDITOR**

# STUDENT EDITORS



**TRISHA SINHA**

EDITORIAL HEAD  
3<sup>RD</sup> YEAR, B.A (H) GEOGRAPHY

*“An essential aspect of  
creativity is not being  
afraid to fail.”*

—Edwin Land



**AMAN KASHYAP**

EDITORIAL CO-HEAD  
2<sup>ND</sup> YEAR, B.A (H) GEOGRAPHY



**SHAGUN SIROHI**

EDITORIAL CO- HEAD  
2<sup>ND</sup> YEAR, B.A (H) GEOGRAPHY



**PRIYANSHU**

EXECUTIVE MEMBER  
2<sup>ND</sup> YEAR, B.A (H) GEOGRAPHY



**SHRISHTI GAUR**

EXECUTIVE MEMBER  
1<sup>ST</sup> YEAR, B.A (H) GEOGRAPHY

2026

# OUR STUDENT COUNCIL 2026

As the Student Council of 2025–26 prepares to pass the baton, we look back at a year that was defined by more than just events; it was defined by resilience, innovation, and a shared vision. Building on the legacy of those who came before us, we aimed to bridge the gap between tradition and the future. Whether it was navigating the complexities of our GIS labs or fostering a vibrant culture within the Geography Department, this journey has been our greatest teacher. We didn't just organise; we grew together, turning challenges into milestones and classmates into a lifelong support system.

To our peers: thank you for your trust. To our mentors: thank you for being the steady hand that guided our ambition. A special and heartfelt thank you to our pillar of strength, the non-teaching staff, Mr Deepak Rana and Mr Jaideep Singh. Your behind-the-scenes dedication is the quiet engine that keeps Shivalik running, and we are forever grateful for your kindness and support.

Place a photo caption here.

We sign off with the hope that the maps we drew this year lead to even greater horizons for the council to come.





**NUPUR SHARMA**  
PUBLIC RELATIONS HEAD



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**TRISHA SINHA**  
EDITORIAL HEAD



**AMAN**  
CO-EDITOR



**SHAGUN SIROHI**  
CO-EDITOR

V A L

# MEET STUDENT COUNCIL

## 2025-2026

DEPARTMENT OF GEOGRAPHY, SHIVAJI COLLEGE, UNIVERSITY OF DELHI



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MANSI RAWAT  
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KAVYA TONK  
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YOGESH KUMAR  
TECHNICAL EXECUTIVE

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# ANNUAL MEET STUDENT EXECUTIVES 2025-2026

DEPARTMENT OF GEOGRAPHY, SHIVAJI COLLEGE, UNIVERSITY OF DELHI



KRISHNADEV PRAJAPATI  
TECHNICAL EXECUTIVE



KHUSHI  
EDITORIAL EXECUTIVE



SHRISHTI GAUB  
EDITORIAL EXECUTIVE



DIVYANSHU ARYA  
EDITORIAL EXECUTIVE

# A LEGACY IN MOTION: A MESSAGE FROM THE ALUMNI COUNCIL

"The roots of education are bitter, but the fruit is sweet."

Last year, we looked back at the cherished moments that defined our time within the walls of the Geography Department. This year, as we flip the page to 2026, we celebrate the living legacy of Shivaji College. Our journey didn't end at graduation; it simply changed scale—from the maps in our practical files to the vast landscapes of our professional careers.

The Geography Department has always been more than a center for academic excellence; it has been our compass. The transition from the structured world of school to the boundless opportunities of college was made seamless by professors who saw us not just as students, but as future change-makers. They gave us the "spatial perspective" to view the world with empathy, curiosity, and a sense of responsibility.

To our faculty: your guidance remains our North Star. The confidence you instilled in us allows us to navigate the complexities of the modern world with the same boldness we felt walking through the college corridors. You transformed classrooms into labs of discovery and mentors into lifelong anchors.

On behalf of the alumni spanning nearly four decades, from the pioneers of 1988 to the fresh graduates of 2025, we express our profound gratitude. Thank you for fostering a culture where connection is as important as curriculum.

As we move forward, we carry the spirit of Shivalik with us reminded always that no matter how far our careers take us, Shivaji College remains our home base. Here's to the memories that ground us and the education that gives us wings.



# CELEBRATING ALUMNI EXCELLENCE

“DREAM IS NOT THAT WHICH YOU SEE WHILE SLEEPING,  
IT IS SOMETHING THAT DOES NOT LET YOU SLEEP.”

A. P. J. ABDUL KALAM

## PROF. SUBHASH ANAND

HEAD OF THE DEPARTMENT  
DEPARTMENT OF GEOGRAPHY  
UNIVERSITY OF DELHI



The Department of Geography, Shivaji College proudly celebrates Dr. Subhash Anand (Batch of 1996) on his appointment as Head of the Department, Department of Geography, Delhi School of Economics, University of Delhi. His accomplishment reflects the excellence of our alumni and stands as an inspiration for current students and the academic community.

## RAJAT PATRE

UPSC CSE 2024- AIR 305  
INDIAN MINISTRY OF FINANCE ASSISTANT  
COMMISSIONER INDIAN MINISTRY OF FINANCE



The Department of Geography, Shivaji College proudly highlights the remarkable success of an alumnus who secured AIR 305 in UPSC CSE 2024 and is serving as Assistant Commissioner in the Indian Ministry of Finance (since August 2025). This accomplishment reflects dedication, excellence, and brings immense pride to the institution.

## ROHIN JAKHAR

UPSC CSE 2025- AIR 39  
ASSISTANT DIRECTOR/DYO (2026) IN THE  
MINISTRY OF YOUTH AFFAIRS AND SPORTS



The Department of Geography proudly celebrates the exceptional accomplishment of Rohin Jakhar, B.A. (Programme) – History & Geography (Batch 2017–2020), Shivaji College. He secured All India Rank 39 (IAS) in the Civil Services Examination 2025 and serves as Assistant Director/DYO (2026) in the Ministry of Youth Affairs and Sports. This accomplishment exemplifies commitment and resilience, and is a proud moment for the institution.

# OUR ESTEEMED ALUMNI



**PROF. SUBHASH ANAND**  
HEAD OF THE DEPARTMENT  
DEPARTMENT OF GEOGRAPHY  
UNIVERSITY OF DELHI  
BATCH- 1996



**PROF. DALJEET SINGH**  
PROFESSOR OF GEOGRAPHY,  
SSN COLLEGE,  
UNIVERSITY OF DELHI  
BATCH- 1996



**PROF. JITENDER SAROHA**  
PROFESSOR OF GEOGRAPHY,  
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UNIVERSITY OF DELHI  
BATCH- 1996



**PROF. VISHWARAJ SHARMA**  
PROFESSOR OF GEOGRAPHY,  
SBSC COLLEGE,  
UNIVERSITY OF DELHI  
BATCH- 1998



**ROHIT SINGH, IAS**  
ADDITIONAL SECRETARY  
DEPARTMENT OF FINANCE  
BATCH- 2006



**RAJAT PATRE, IRS**  
ASSISTANT COMMISSIONER  
INDIAN MINISTRY OF FINANCE  
BATCH- 2017



**DR DHARMENDRA SINGH**  
FINANCIAL ADVISOR ACCOUNTS  
OFFICER IN PHED, GOVT. OF MP  
BATCH- 2011



**AMIT KUMAR KUSHWAHA**  
DEPUTY COMMANDANT, PUBLIC  
RELATIONS OFFICER  
BATCH- 2009



**DR. MANMOHAN**  
ASSISTANT COMMANDANT AT  
ICAPS, MINISTRY OF HOME  
AFFAIRS  
BATCH- 2009



**DR. BHARAT RATNU**  
ASSISTANT PROFESSOR,  
DEPARTMENT OF GEOGRAPHY,  
SHIVAJI COLLEGE, NEW DELHI  
BATCH- 2006



**MAJOR MUNISH KUMAR**  
SECOND-IN-COMMAND, ARMY  
ORDNANCE CORPS  
BATCH- 2009



**AJAY KHOSLA**  
GENERAL MANAGER SALES AND  
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EXPRESS  
BATCH- 2006

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## ARTICLE 1

# THE GEOPOLITICS OF THE BRAHMAPUTRA: CHINA'S DAM PROJECTS AND INDIA'S CONCERN

AKASH CHAUHAN

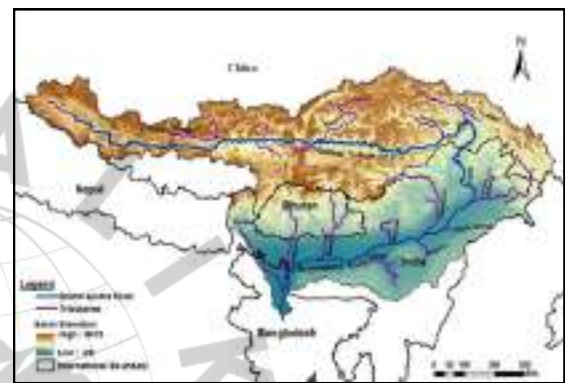
2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE

**“Nature creates rivers to unite landscapes, yet humans divide them with borders and conflicts.”**

As global water demand increases and climate change intensifies, rivers that cross national borders are turning into strategic resources and potential sources of geopolitical tension. The Brahmaputra River, which originates in China and flows through India and Bangladesh, represents an important example of such transboundary water politics. China's construction of dams on the upper reaches of the river has raised concerns in India regarding water security, environmental sustainability, and regional stability.

## CHINA'S HYDROPOWER PROJECTS

The Brahmaputra originates from the Angsi Glacier in the Tibetan Plateau, where it is known as the Yarlung Tsangpo. It flows across Tibet before entering India through Arunachal Pradesh and then passes through the fertile plains of Assam before reaching Bangladesh. China has



developed several hydropower projects on the upper course of the river, including the Zangmu Dam. These projects aim to generate renewable energy and support regional development in Tibet. China claims that these dams are run-of-the-river projects, meaning they do not significantly divert water from the river.



## CONCERNS FOR INDIA

For India, the Brahmaputra River is a lifeline for the northeastern states, particularly Arunachal Pradesh and Assam. The river supports agriculture, fisheries, and transportation while sustaining the livelihoods of millions of people. India fears that upstream dams could allow China to regulate the river's flow or reduce sediment transport that maintains fertile floodplains in Assam. Such changes could affect agriculture, water availability, and ecological balance in the region

## POSSIBLE SOLUTIONS

To address these concerns, stronger cooperation between the countries sharing the Brahmaputra basin is essential. Improving water diplomacy and maintaining transparency in dam construction and river management can help build trust. Increased sharing of hydrological data can assist in flood forecasting and disaster management. At the national level, India should strengthen flood control systems, promote sustainable river basin planning, and invest in scientific monitoring of Himalayan rivers.



In conclusion, the dual challenges of development and resource management are inextricably linked in India's quest for economic resilience. While the nation possesses a rich endowment of natural capital, the pressures of rapid industrialisation necessitate a shift toward sustainable lifestyles and clean technologies. The

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## ARTICLE 2

# WHERE MAPS END AND LIVES BEGIN: CLIMATE CHANGE AND THE CHANGING WINTER LANDSCAPE OF THE KASHMIR VALLEY

TAZKIYA WASEEM QADRI

1<sup>ST</sup> YEAR, B.A. PROGRAMME, SHIVAJI COLLEGE

Geography is often perceived as a discipline concerned primarily with maps, measurements, and spatial patterns. Yet, at its core, geography is equally attentive to lived spaces – how people experience, interpret, and respond to their environments. Climate change, when examined through this human geographical lens, emerges not merely as an environmental phenomenon but as a deeply social and spatial process. This becomes particularly evident in regions where climate has historically structured seasonal rhythms and everyday practices, such as the *Kashmir Valley*.

Winter in the Kashmir Valley has long functioned as a defining seasonal framework. Snowfall was once a relatively predictable feature of the valley's climate, shaping agricultural cycles, water availability, mobility patterns, and cultural life. In recent years, however, winter conditions have displayed increasing irregularity. Delayed snowfall,

prolonged dry spells, and above-average winter temperatures across the valley floor indicate a significant climatic shift. While the higher reaches surrounding the valley have continued to receive snowfall – albeit reduced and inconsistent – the low-elevation areas of the valley have experienced marked deviations from earlier winter patterns, underscoring the spatial unevenness of climatic change (Figure 1).



Figure 1: Topographical variation across the Kashmir region, indicating elevation, areas and river systems referenced in the discussion on changing winter patterns. (Source: Raj Bhagat P, X (Twitter), July 2020)

## CLIMATE CHANGE AS A SPATIALLY DIFFERENTIATED PHENOMENON

Climate change does not manifest uniformly

across regions. Its impacts are mediated by altitude, topography, land use, and socio-economic conditions. Human geography draws attention to this differentiated vulnerability, emphasising how climatic risks are experienced unevenly even within the same broader region.

In the Kashmir Valley, the contrast between the *low-lying valley floor* and the surrounding *higher reaches* is particularly instructive. The valley floor, which supports dense settlement, urban centres, and intensive agricultural activity, has increasingly experienced winters characterised by diminished snowfall.

This spatial variation highlights the importance of *scale-sensitive analysis* in understanding climate change. The continued occurrence of snowfall in higher elevations does not offset the disruptions experienced in the valley; rather, it reveals how climate change selectively reshapes landscapes and livelihoods.



Figure 2: First snowfall of the season in Srinagar  
(Photograph: Basit Zargar, 23 January 2026)

Snowfall has historically played a crucial hydrological role in the region. Accumulated snow functioned as a natural reservoir, releasing water gradually into river systems such as the Jhelum during spring and early summer (Figure 1). Reduced snow cover on the valley floor raises concerns regarding future water availability, particularly for agriculture and domestic consumption. These changes, though gradual, have long-term implications for ecological stability and resource management.

The altered winter regime has also affected horticulture, a key economic activity in the Kashmir Valley. Crops such as apples depend on adequate chilling hours to ensure healthy yields. Warmer winters and delayed snowfall compromise this requirement, placing orchard-dependent households under increasing economic stress. Unlike abrupt climatic events, these changes unfold incrementally, making their impacts less immediately visible but deeply consequential.

### HUMAN EXPERIENCES OF AN ALTERED WINTER

From a human geographical perspective, the consequences of climatic change extend beyond environmental metrics to everyday experience. Traditionally, winter in the Kashmir Valley imposed a distinct seasonal rhythm characterised

by reduced mobility, altered work patterns, and heightened reliance on local networks. The increasing unpredictability of winter conditions has disrupted this rhythm.

Low-elevation urban and semi-urban areas of the valley, including cities such as Srinagar, now experience winters that are neither consistently snow-bound nor climatically stable. This ambiguity complicates planning and preparedness, particularly for informal workers, small vendors, and those dependent on seasonal tourism. Their livelihoods rely not only on climatic conditions but on the predictability of those conditions.

There is also a discernible shift in intergenerational experience. Older residents recall winters defined by prolonged snow cover and extended periods of isolation, while younger generations encounter fragmented and inconsistent winter seasons. This divergence reflects how climate change reshapes not only physical landscapes but also social memory and environmental expectations.

### **PLACE, IDENTITY, AND CLIMATIC UNCERTAINTY**

Place, within human geography, encompasses emotional, cultural, and symbolic attachments to space. In the Kashmir Valley, winter landscapes –

*snow-covered rooftops, frozen water bodies, and slowed rhythms of daily life* – have long contributed to regional identity. The diminishing presence of snow across the valley floor unsettles this sense of place, introducing a form of cultural and emotional dislocation.

Climate change thus operates at the intersection of environmental processes and cultural experience. As seasonal patterns become less reliable, place-based practices and shared meanings associated with winter lose their grounding. These intangible impacts are often absent from climate policy discussions, yet they are central to understanding how communities experience and respond to environmental change.

### **The Role of Geography in Climate Understanding**

Geography offers an integrative framework for analysing climate change by linking physical processes with social realities. The case of the Kashmir Valley highlights the importance of recognising spatial variation within regions, particularly distinctions between low-elevation valley floors and surrounding higher reaches.

Geographers contribute to climate discourse by emphasising local context, spatial differentiation, and lived experience. Effective climate adaptation and sustainable development

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strategies must therefore be grounded in *region-specific knowledge* and attentive to how environmental change is *unevenly distributed* across space and society.

## CONCLUSION

Climate change is frequently communicated through global indicators and statistical projections. While these tools are essential, they risk obscuring the everyday realities through which climate change is actually lived. The changing winter landscape of the Kashmir Valley illustrates how climatic shifts

manifest unevenly across space, reshaping hydrological systems, livelihoods, cultural identity, and social rhythms.

By foregrounding human experience alongside environmental change, geography reminds us that climate change is not solely a physical process but a spatial and social one. It is within these lived geographies – *where maps end and lives begin* – that meaningful understanding and equitable responses to climate change must emerge.



## ARTICLE 3

# ORCHHA: THE HIDDEN JEWEL OF INDIA AND ITS FIGHT AGAINST TIME

YOGESH KUMAR

4<sup>TH</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE

Hidden away on the banks of the serene Betwa River in the state of Madhya Pradesh, lies the charming little town of Orchha, whose very name means “hidden.” Founded in the 16th century by Bundela Rajput ruler Rudra Pratap Singh, the ancient town of Orchha is an amazing marvel that seems to be stuck in time (Madhya Pradesh Tourism Board, Archaeological Survey of India). While it is still an underrated destination, even in comparison to other prominent tourist routes in India, those who venture to the hidden town of Orchha are in for a real treat, even as the town struggles to stay alive in the face of serious challenges (UNESCO, 2023).

A Beautiful, Forgotten Capital Walking through Orchha is like stepping directly into a medieval fairytale. The town is famous for its unique Bundela style, which combines palace, fort, and temple designs in perfect harmony (Tillotson, 1990). One of its crowning glories is the Jahangir Mahal, a beautiful three-story palace built in the 17th century to celebrate the Mughal Emperor Jahangir (Archaeological Survey of India, n.d.). It is a perfect symbol of the friendship between Rajputs and Mughals, decorated with turquoise tiles, elephant-carved brackets, and serene courtyards (Michell & Zebrowski, 1999).



Then there is the Chaturbhuj Temple, which is a massive and towering structure that looms over the skyline. Reaching heights of 344 feet, it is one of the tallest temple structures in India, originally designed to house the idol of Lord Rama (Madhya Pradesh Tourism Board). However, local lore has it that the idol of Lord Rama refused to leave the palace of the queen, which then came to be known as the Ram Raja Temple (Government of Madhya Pradesh, 2022). Today, this is the only temple in India where Lord Rama is worshipped not only as a god but as a King, with a gun salute and a guard of honour from the local police (Madhya Pradesh Tourism Board).



Apart from the majestic palaces, the beauty of Orchha lies in its serene corners. The Royal Chhatris or cenotaphs stand elegantly on the banks of the river, paying tribute to the ancient kings of the past (Archaeological Survey of India). On the other side of the river is the Orchha Wildlife Sanctuary, a serene forest resort where you can spot leopards, monkeys, peacocks, and the critically endangered long

billed vultures that have made the ancient monuments their home (Singh, 2017).

The Difficulties of Time and Nature. Nevertheless, maintaining this underrated paradise is not an easy job. Throughout the years, Orchha has experienced various difficulties, mainly caused by nature and the changing environment.

The biggest danger facing Orchha is the floods. Since the town is completely surrounded by the Betwa River, it is extremely susceptible to heavy monsoons (Sharma, 2018). If too much rain falls, or when the nearby Matateela Dam releases water, the rivers flood (Sharma, 2018). These floods not only make the monuments inaccessible, but they also weaken the ancient stone structures (Singh, 2017).



On the other hand, since Orchha is located in the Bundelkhand region, it is also susceptible to severe droughts and extreme summer heat (Singh, 2017). These extreme weather changes,

from the intense and damaging waters to the extreme heat, hasten the natural process of decay of the ancient brick, stone, and lime mortar (Government of Madhya Pradesh, 2022).

Modern and Human Challenges Orchha also faces various other modern and human challenges. Due to the high population growth and unplanned urbanisation around the historical sites, the town of Orchha is facing immense pressure (Government of Madhya Pradesh, 2022). Lack of a proper underground sewerage system and proper waste disposal has resulted in the pollution of the beautiful Betwa River, sometimes causing the spread of water-borne diseases in the surrounding areas (Sharma, 2018). Moreover, being a prominent place of worship, Orchha attracts hundreds of thousands of pilgrims during important festivals like Ram Navami and Diwali (Madhya Pradesh Tourism Board). Managing these huge crowds of pilgrims through the narrow medieval streets of Orchha often results in the risk of stampedes (Government of Madhya Pradesh, 2022).

A Hopeful Future Despite the difficulties, Orchha is not giving up. Efforts are in place to bring this hidden city into the global spotlight. Recently, the dossier of the town was accepted by the central government for the nomination to the UNESCO World Heritage List for the years

2027-28 (UNESCO, 2023). This will bring the global recognition, funds, and techniques needed for the conservation of the town.



Orchha is a unique combination of majestic architecture, religious importance, and natural beauty. It is a place that has lived through wars, floods, and the ages. It is our duty to understand the importance of this place and take steps to preserve it from the clutches of environmental degradation and the challenges of the modern world.

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## ARTICLE -4

# CITIES BORN ON THE BANKS OF THE GANGA

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Purvanchal lies within the fertile Gangetic plain, where rich alluvial soil, abundant water, and a humid subtropical climate create ideal agricultural conditions. The Ganga has historically supported dense settlements by providing irrigation, replenishing soil fertility through floods, and sustaining aquatic life. Surplus agricultural production encouraged crafts, trade, and administrative functions, gradually transforming riverbank villages into stable towns and cities.



flower vendors selling, offerings, silk weavers, photographers, guides, and small shopkeepers together sustain a vibrant river-based economy that has evolved over centuries. The ghats also function as social commons—spaces of storytelling, music, yoga, festivals, and informal gatherings—binding residents and visitors in a shared experience. For families who have lived for generations along these steps, the river embodies ancestry, identity, and continuity, nurturing profound cultural, emotional, and even philosophical ties that define the city's timeless character.

## VARANASI – SACRED RIVER AND EVERYDAY LIFE

In Varanasi, the Ganga is not merely a river but the axis around which sacred belief, daily livelihood, and collective memory revolve. The historic ghats—such as Dashashwamedh Ghat and Manikarnika Ghat serve as dynamic cultural stages where spirituality and survival intersect. Here, ritual bathing, evening aartis, and cremation ceremonies unfold alongside commerce, tourism, and community life. Priests conducting rites, boatmen ferrying pilgrims,

## PRAYAGRAJ – CONFLUENCE AND HUMAN MOVEMENT

Situated at the Triveni Sangam the confluence of the Ganga, Yamuna, and the mythical Saraswati



Prayagraj has historically attracted pilgrims, traders, and settlers. Seasonal gatherings such as the Kumbh Mela create temporary yet massive population concentrations, demonstrating how river geography drives movement, economy, and cultural exchange.

### PATNA – RIVER, AGRICULTURE, AND POPULATION CONCENTRATION

Patna's growth is closely tied to fertile farmlands and river transport. Historically known as Pataliputra, it thrived as a center of governance and trade. The river facilitated agricultural exchange and craft industries, drawing migrants despite periodic flooding risks.



### Buxar – Agriculture and River Trade

Buxar's identity has long been intertwined with agriculture and river-based commerce. Surrounded by fertile plains nourished by the Ganga, the region developed as a hub where farming shaped both the economy and social rhythms of life. Historic accounts and visual records often highlight expansive fields, traditional cultivation practices, and the steady movement of goods along the river, underscoring Buxar's strategic location.



The Ganga not only supported irrigation but also enabled trade, travel, and cultural exchange, linking the town to wider networks across North India. Even today, daily life continues to reflect this legacy: farmers working the land, fishermen relying on the river's resources, and small-scale traders sustaining vibrant local markets. Together, these activities preserve Buxar's enduring character as a community rooted in the synergy of land, livelihood, and river.

## GHAZIPUR – OPIUM CULTIVATION AND AGRARIAN GEOGRAPHY

Ghazipur became known for opium cultivation during colonial times. The fertile soil and irrigation from the Ganga enabled poppy farming. Historic images of the opium factory and riverbanks reflect how geography shaped economic specialization and settlement structure



## BHAGALPUR – TEXTILE TRADITION AND RIVER RESOURCES

Bhagalpur's renowned silk industry evolved in close relationship with the Ganga, which served as both a practical resource and a commercial lifeline. The river's abundant water supported essential processes such as washing raw silk and dyeing threads, enabling artisans to maintain the quality and vibrancy for which Bhagalpuri silk became famous. Historical photographs and records frequently depict tightly knit weaving communities, where households functioned simultaneously as living spaces and workshops. Within these modest homes, looms, dyed yarn, and skilled craftsmanship blended seamlessly with everyday domestic life. The Ganga also played a crucial economic role: river transport

routes linked local silk producers to regional trading centres, facilitating the movement of textiles and expanding market reach. This integration of natural resources, artisanal labour, and river-based connectivity helped establish Bhagalpur as a distinguished centre of textile heritage. Even today, the legacy endures through generations of weavers who continue to sustain the city's cultural and economic identity.



The Ganga not only supported irrigation but also enabled trade, travel, and cultural exchange, linking the town to wider networks across North India. Even today, daily life continues to reflect this legacy: farmers working the land, fishermen relying on the river's resources, and small-scale traders sustaining vibrant local markets. Together, these activities preserve Buxar's enduring character as a community rooted in the synergy of land, livelihood, and river.

## CULTURAL LANDSCAPE OF THE GANGA CITIES

Across Purvanchal, the Ganga has created a cultural landscape blending natural and human elements: ghats, boats, temples, fields, and markets. Historic imagery reveals how

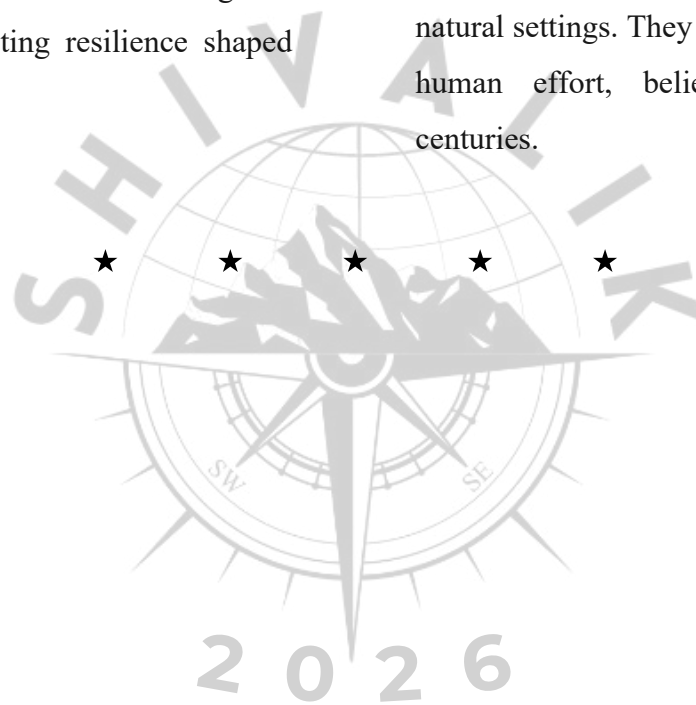
settlements evolved in harmony with river rhythms.

### ENVIRONMENTAL STRESS AND HUMAN ADAPTATION

Floods, erosion, and environmental pressures have always challenged the riverbank communities. Historic photographs show adaptation strategies such as raised housing and seasonal migration, reflecting resilience shaped by geography.

### CONCLUSION

The cities of Purvanchal along the Ganga illustrate a deep and continuous relationship between humans and their environment. Through agriculture, trade, ritual life, and settlement patterns, the river remains an active force shaping both history and contemporary society. These historic visuals reinforce a central idea of human geography: landscapes are not merely natural settings. They are living spaces shaped by human effort, belief, and adaptation over centuries.



## ARTICLE 5

# A GEOGRAPHICAL TRAVELOGUE OF DALHOUSIE

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2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE

Dalhousie is a beautiful hill station located in the Chamba district of Himachal Pradesh, in the north-western Himalayas. I visited Dalhousie during the summer season (around May); however, despite the summer, the town experienced a chilly, soothing, and cool temperature.



Dalhousie lies at an altitude ranging from about 1,970 m to 2,000 m above sea level. It is spread across five hills—Bakrota, Kathlog, Potreyn, Tehra, and Bhangora—which together form an undulating relief. This journey not only gave me lasting memories but also many unforgettable scenic views. The narrow winding streets, deep valleys, and steep slopes clearly indicate that Dalhousie is a part of the young fold mountains of the Himalayas.

The climate of Dalhousie is cool, and due to its high altitude, temperatures remain low throughout the year, with occasional snowfall during winter. The region receives moderate to heavy rainfall during the monsoon season due to

the following reasons:

- Influence of the South-West Monsoon Winds
- Orographic rainfall
- Altitude and low temperature
- Windward location

### HUMAN SETTLEMENTS

The settlements are mostly scattered due to the mountainous contours. Houses have sloping roofs to avoid the accumulation of snow, which reflects adaptation to the physical environment. Population density is low in this region.

### ECONOMY

The main occupations of the people are



tourism, agriculture, and small-scale trade. Terrace farming is practised on hill slopes instead of large-scale farming due to the rugged terrain. Tourism plays a major role in the local economy. Places like Khajjiar, often called the “Mini Switzerland of India,” attract visitors because of their landscape and temperate climate. Road transport is the primary means of connectivity, but it is sometimes disrupted due to landslides.

This journey to Dalhousie helped me understand the close relationship between relief, climate, temperature, vegetation, and human settlements and their activities. This town is a great example of human adjustment to the natural environment. Dalhousie is not just a tourist destination but also a living geographical classroom that clearly demonstrates the influence of the environment on human occupation and settlement.



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**ARTICLE 6****PATHWAYS BEYOND THE CLASSROOM:  
THE STORY OF GEO-GATEWAYS***CHETNA BHUMBRI**4<sup>TH</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE*

**During my undergraduate journey in the Department of Geography at Shivaji College, University of Delhi, I often found myself searching for clarity beyond the syllabus, that is, clarification on issues like internships, certificate programs, research experience, GIS and Remote Sensing training, career competitions and a general overview of what the world in academia and professional worlds would offer me once I had graduated. These questions were not based entirely on doubt, rather on curiosity, and the genuine thirst to determine how the study of geography could lead.**

Very soon I realized that opportunities were indeed present but they were scattered in a number of portals, organizations, as well as informal networks. The access always depended on whom one would talk to, which platforms one would look at as well as the time spent in the process of exploration. Being a first- and second-year student, I remember spending much time researching on possible courses, webinars, or internships, and finding out that most of them had already been closed, or difficult to verify. Over time, I slowly realized that most of my peers and juniors were also facing similar issues.

The idea of **Geo-Gateways** was a result of these experiences. I wanted to establish the place that I longed to have at the beginning of my departmental life- one where Geography students could easily find confirmed, relevant and current information related to learning, skill acquisition and career exploration. The initiative did not begin with a formal structure or a large plan; but was initiated just like a simple intention: to help my fellow students, provide them with access to opportunities.





**Geo-Gateways is today a student-driven platform** that extracts and shared opportunities, including internship opportunities, research opportunities, certification opportunities, workshops, GIS and Remote Sensing opportunities, academic competitions, and advice on competitive examinations. It is also informative about the development of a resume and optimizing LinkedIn profiles, and academic visibility- fields which are becoming more and more crucial as Geography enters the field of professional, technical, and research-based work.

**Geo Gateways** has been gradually developing as a small-scale academic network, since its creation, to become an academic community of more than 300+ students relying on its edited materials and services on a regular basis. The purpose of the platform is more than simply the dissemination of information; it is also aimed at reducing the obstacles that can be faced by students in the world of academic and professional opportunities. What motivated me further was the fact that I noticed Geography as a discipline was changing.

As the fields of climate studies, environmental policy, sustainability, urban planning, disaster management, and spatial data analytics increasingly intersect, the field is now demanding skills that go beyond the conventional textbooks. Applications like QGIS, ArcGIS, and Google Earth Engine have become the focus of the modern geographic practice, and students gain several significant advantages when they start working with those applications at an early stage of their studies. Through Geo-Gateways, I would make such resources more visible, approachable, and accessible to the undergraduate learners.

The platform is also a small step towards peer learning among the students. Although academic institutions provide learners with a solid background understanding, it is not uncommon that the process of sharing information, experience, and resources with other students can be beneficial. Geo -Gateways tries to build this spirit of cooperation, by allowing the students to contribute, volunteer and involve themselves in the development of an enabling learning environment. I hope that Geo-Gateways will ultimately turn into a community-based project where the knowledge moves horizontally among students instead of being locked in the closed networks.

In the future, Geo -Gateways will establish mentorship rings, enhance the involvement of alumni, establish forums of research reading, and assist students going through academic and

competitive exams. These ambitions are based on seeing the actual necessities in the department and realizing that the undergraduate education does not end at the desk of examination but it moves towards professional, research and academic life in which rarely does the guidance come by until the students seek it.

In this regard, Geo-Gateway hopes to be a narrow gateway that introduces students in a wider ecosystem of possibilities in the field of Geography and the geospatial sciences. The initiative, in, via making information more accessible and visible, with a culture of academic

awareness, collaboration, and opportunity sharing among geography students, hopes to make a modest contribution.

I am extremely thankful to the Department of Geography in shaping my learning that promotes fieldwork, interdisciplinary thinking, and intellectual inquiry. It is only under such circumstances that programs like Geo -Gateways can be implemented, and it is my hope that this platform will expand into new generations and become a valuable asset connecting classroom education to the rest of the world of opportunities open to geography students.

*“Connecting geography students with opportunities, resources, and pathways beyond the classroom”*

Chetna Bhumbri (Founder, Geo-Gateways)



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**ARTICLE 7****THE ONLY FLOATING LAKE IN THE  
WORLD: LOKTAK LAKE***SHRISHTI GAUR**1<sup>ST</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE*

**Have you ever imagined living on a mass of grass—soft, marshy, and floating gently on a vast body of water? If this sounds like a scene from a mythical story, let me introduce you to Loktak Lake, the jewel of Manipur and the world’s only floating lake. Located in the Bishnupur district of Manipur, Loktak is nourished by several rivers. The Manipur River, originating near the confluence of the Imphal River and Khuga River, forms its major lifeline. Along with it, the Nambul River brings silt and nutrients, enriching the lake’s water. Together, these inflows ensure that Loktak remains a vibrant wetland supporting diverse flora, fauna, and human livelihoods.**

Nature did not stop at creating a lake it went a step further and crafted floating islands. These are the phumdis, the beating heart of Loktak. Formed over years, and compressed into thick, spongy masses. They behave almost like living organisms: sinking in winter to absorb nutrients from the lakebed and rising again in summer to

to float like islands. Loktak’s unique conditions—slow-moving water, nutrient-rich inflow, and fluctuating historical water levels—allowed these phumdis to evolve nowhere else on Earth.

Among the most captivating sights on Loktak are the athaphums, human-made circular phumdi structures created by local fishing communities. These rings serve as fishing enclosures and reflect the profound ecological understanding of the people who live here. Athaphums highlight how traditional knowledge and natural landscapes coexist in harmony.

On the southern edge of Loktak stands Keibul Lamjao National Park, the world’s only floating national park. It is the last refuge of the Sangai, Manipur’s state animal and an endangered deer species known for its delicate, dancing walk. The park is also home to hog deer, otters, migratory birds, and a variety of freshwater fish, all of which depend on the stability and health of the phumdis.



breaking into fragments. Declining fish populations, pollution from growing settlements, changing monsoon patterns, and unregulated tourism. Each problem adds weight to the next, creating an urgent ecological challenge.

Loktak Lake is not just a geographic marvel; it is an ecological miracle and a cultural heritage site.

Its tectonic origin, river-fed beauty, floating

phumdis, endangered wildlife, and the sustainable lifestyle of its people make it one of India's most extraordinary natural treasures. Protecting Loktak is not just a responsibility of Manipur but of the entire world. The lake stands as a living reminder of how beautifully nature and human life can coexist, floating together in delicate balance.



## ARTICLE 8

# HOW JANUARY RAIN MITIGATES DELHI'S TOXIC WINTER POLLUTION

AMAN KASHYAP

2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE

Delhi, the heart of India, has unfortunately become a gas chamber of "smog." For nearly two decades, the city has grappled with an atmospheric crisis that turns its winter sky grey. The air quality typically begins to decrease in October, hitting "Severe" or "Hazardous" levels by December and January. While the city's millions of residents have become consumers of air purifiers and N95 masks, the fundamental problem remains: for several months a year, the air in Delhi is medically unsafe to breathe.

## WHY AIR POLLUTION HAPPENS IN DELHI?

The crisis is not the result of a single factor but a "perfect storm" of anthropogenic and natural causes.

**Vehicular and Industrial Emissions:** With millions of registered vehicles and peripheral industrial hubs, the baseline of pollutants and Particulate Matter is exceptionally high.

**Biomass Burning:** Post-harvest stubble burning in neighbouring states like Punjab and Haryana

contributes a significant smoke load in early winter.

**Construction Dust:** Massive infrastructure projects keep coarse dust particles suspended in the air. **Winter Stagnation:** In winter, low temperatures lead to a phenomenon called temperature inversion, where a layer of warm air traps cooler, polluted air near the ground.

## EFFECT OF AIR POLLUTION ON PUBLIC HEALTH

The health implications are staggering. According to the Air Quality Life Index (AQLI) 2025, the average resident of Delhi is expected to lose approximately 8.2 years of their life expectancy due to prolonged exposure to high PM<sub>2.5</sub> concentrations. Recent figures indicate that during "Severe" AQI days, hospital admissions for respiratory distress, asthma attacks, and cardiovascular issues in Delhi surge by nearly 20-25%. In early January 2026, before the rains arrived, the city recorded an average PM<sub>2.5</sub> level of over 150  $\mu\text{g}/\text{m}^3$ —nearly 10 times the World Health Organisations (WHO)

recommended daily limit. Not only do humans suffer because of toxic air but those who suffer more and direct are animals. For humans suffering, we have data to analysis but for animals there is no data and usually those creatures suffers in silence.

### **Delhi's Morphology and Topography: The Natural Trap**

Delhi's geography is a double-edged sword. Delhi sits on this relatively flat fertile plain formed by alluvium from the Ganga and Yamuna. Delhi is the northern plains just south of the mountains. The Himalayas act as a northern boundary that influences Delhi's climate and traps pollutants. The Aravali Range to the south and west. This creates a "bowl effect."

The Aravali acts as a barrier that slows down the winds coming from the west, while the Himalayas prevent the northward dispersion of pollutants. Furthermore, the city's Urban Heat Island (UHI) effect, caused by dense concrete structures, prevents the vertical movement of air, essentially clamping a "lid" on the city's pollution.

### **January Rain: Why did it happen in 2026?**

In January 2026, Delhi saw a significant shift in its weather pattern due to a series of Western Disturbances (WDs). These are extra-tropical storms originating in the Mediterranean region

that travel eastward. On January 23 and 25, 2026, intense WDs hit the capital, bringing about 25.4 mm of rain—roughly 33% above the long-period average. These systems are essential for bringing moisture and rain to Northern India during the dry winter months.

### **Is Rain Good in This Season?**

The short answer is: Yes, but it is a temporary fix.

The January 2026 rains performed a process known as "wet deposition." As raindrops fall, they collide with suspended particulate matter PM {2.5} and PM {10}, "washing" the atmosphere and dragging the toxins to the ground. Following the rain on January 25, Delhi's AQI plummeted from the "Very Poor" category (above 350) to the "Moderate" category (around 150). This provided a much-needed reprieve for the lungs of the city's 30 million inhabitants.

### **Climate Change and Other Problems Related to Rain**

While the rain helps air quality, it also signals a changing climate. The intensity of Western Disturbances has become increasingly erratic. In 2026, while Delhi received surplus rain, the Western Himalayas experienced a deficit in snowfall earlier in the season.

**Humidity and Fog:** Post-rain humidity,

combined with falling temperatures, often leads to "dense fog" or "smog," which can reduce visibility to near zero, causing transport chaos and accidents.

**The Rebound Effect:** Rain only clears the air temporarily. Once the ground dries and the wind dies down, the same emission sources (cars, factories) quickly refill the "bowl" with pollution.

#### Pollution Mitigation by Vegetation

Vegetation plays a silent but crucial role during and after the rains. Plants help in:

**Soil Stabilization:** Preventing the rain from turning construction sites into mud-dust traps once they dry.

**Transpiration:** Helping maintain the moisture levels that can suppress dust.

**Pollutant Absorption:** Beyond particulates, trees absorb gaseous pollutants like CO<sub>2</sub> and dust through their stomata.

#### Current Situation and Control Measures

As of February 2026, the Delhi government has implemented a 15% reduction target for the annual average AQI. The Graded Response Action Plan (GRAP) remains the primary legislative tool.

Measure	Trigger Condition
GRAP Stage II	AQI "Poor" (201-300)
GRAP Stage III	AQI "Severe" (401-450)
GRAP Stage IV	AQI "Severe+" (>450)

In late January 2026, the Commission for Air Quality Management (CAQM) was able to revoke Stage III measures because the rain-induced improvement was so significant.

The January rains of 2026 were a literal lifesaver for Delhi, proving that the most effective way to clear the city's air is through the power of nature. However, we cannot rely on the "luck" of a Western Disturbance to manage a public health crisis. While the rain provides the "cleansing breath," long-term solutions such as massive expansion of urban forests, transitioning to electric mobility, and strict dust control are the only ways to ensure that Delhi's residents don't have to wait for a storm to breathe.



## ARTICLE 9

# COP 30 SUMMIT, BELEM, BRAZIL

SHOURYA RANJAN

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The 30<sup>th</sup> Conference of Parties (COP30) to United Nations Framework Convention on Climate Change (UNFCCC) was held in Belem, Brazil from November 10 to 21, 2025.

This holds significant impact because it coincided with the decadal anniversary of Paris Agreement which was held in the year 2015. Since it was primarily hosted in the Amazon region, the summit was also known as 'COP of Implementation', 'COP of Truth' and the 'Forest COP'. The meeting, apart from major COP30, included CMP20 (Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol) and CMA 7 (Conference of the Parties to the Paris Agreement).

The COP 30 meeting formally began with inaugural meetings and hence setting agenda for multiple rounds of negotiations and planning. Various officials, experts and ministers delivered statements explaining national positions, concerns and expectations. Through continuous dialogue, bargaining and compromise, the

meeting.

Key Takeaways from the global summit were:

**1) Belem Health Action Plan:** It aims to strengthen global health systems to cope better with the impacts of climate change. It includes health equity and climate justice. Health Equity refers to that everyone should get a fair opportunity to be as healthy as possible by removing obstacles. Climate justice refers to the climate change disproportionately impacts vulnerable communities who are least responsible for it.

**2) Tropical Forests Forever Facility (TFFF):** It aims to mobilize a sum of 125 billion dollars through public and private investment using return to pay nations that conserve forests. It is based on 'payment for performance' model as it rewards tropical forest countries with a continuing source of funding as they preserve their forests. Brazil has contributed 1 billion dollars to TFFF to commence this initiative. India has joined as an Observer.

**3)Belem Political Package:** It is the major outcome of COP-30. It emphasized climate finance, adaptation, a just transition to a green economy, gender inclusion and strengthening global cooperation with ‘Mutirao’ spirit and collective action.

**4)Santa Marta Conference:** It is scheduled to be held in Santa Marta, Colombia, in April 2026. It will be co-hosted by Colombia and the Netherlands. Its purpose is to create a global framework for a just-transition away from fossil fuels. It will focus on legal, economic and social dimensions of this transition.

**5)Open Planetary Intelligence Network (OPIN):** It is a new initiative to standardise climate data. It is focused on unifying climate data systems, which will foster decision-making on climate-related issues.

**6)Global Ethical Stocktake (GES):** It is an initiative that seeks to integrate ethical considerations into climate policy making. It is inspired by the ‘Global Stocktake’ which assesses global progress on Paris Agreement. Its Asia edition was held at New Delhi in September 2025.

**7)Belem 4X Pledge:** It is a commitment made by several countries, including India, Brazil, Japan and Italy, to at least quadruple the global production and use of sustainable fuels by 2035. {From 2024 levels}. Sustainable fuels include biofuels, biogas, synthetic fuels and hydrogen fuels. It was launched on 14th October, 2025, at a pre-COP 30 meeting in Brasilia.

**8)Belem Declaration on Hunger, Poverty and People Centred Climate Action:** It is a pledge to place social justice and poverty alleviation at the core of global climate efforts. 43 countries and the EU have signed this declaration. India has not signed it yet.

**9)National Adaptation Plan (NAP) Implementation Alliance:** It is a global initiative launched at COP30 to accelerate the implementation of NAP. It is a multi-stakeholder partnership to mobilise funding and strengthen national coordination and turn adaptation plans into investment-ready projects.

**10)‘Mutirao Strategy’:** It is a Portuguese term for “collective action”. It refers to the Brazilian tradition of collective, community-driven mobilisation. It aims to close the gap between pledges and delivery. The COP30 Summit marked a turning point by focus turning climate promises into real action. Countries must reduce

greenhouse gas emissions faster. Developed nations should provide timely climate finance to developing countries. More support is needed for adaptation, loss and damage. Vulnerable communities must be protected from climate impacts. Trust between countries should be strengthened through clear targets and transparency. Climate action should support sustainable development and clean technology. The success of COP30 will depend on cooperation and political will. Effective decisions at COP30 can help secure a safer and more stable climate for present and future generations.

#### **ABOUT UNFCCC:**

The United Nations Framework Convention on Climate Change (UNFCCC) is an international treaty adopted in 1992 at the Rio Earth Summit and came into force in 1994. The Rio Summit 1992 also created 2 more major environmental concern bodies, namely the Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD). Its headquarters is in Bonn, Germany. The UNFCCC aims to control greenhouse gas emissions to limit climate change. It has 197 parties (countries plus the European Union). Under the UNFCCC, countries meet annually in the Conference of Parties (COP) to review progress. The convention follows the principle of Common but Differentiated Responsibilities

(CBDR), meaning developed countries have greater responsibility in tackling climate change.

COP Meetings of UNFCCC are held in rotation in 5 UN-designated geographical regions :

- 1) Africa
- 2) Asia-Pacific
- 3) Eastern Europe
- 4) Latin America and the Caribbean
- 5) Western Europe and Others

COP1 was held in Berlin in the year 1995. Delhi hosted the COP-8 in 2002. This was the first time any major environmental summit was hosted on Indian soil. COP21 was a crucial conference held in Paris in the year 2015 that led to the adoption of the Paris Agreement, that aims to limit global temperature rise to below 2 degrees Celsius and pursue efforts to limit it to 1.5 degrees Celsius above pre-industrial levels. COP26 took place in Glasgow (UK) in 2021, in which the Prime Minister of India launched the LiFE Campaign, which stands for Lifestyle for Environment, that stresses the idea of “mindful consumption instead of wasteful consumption”. It promotes sustainable lifestyles such as saving energy, reducing waste, conserving energy and using resources responsibly. COP29 was held at Baku, Azerbaijan in 2024, which was referred to as the ‘Finance COP’. COP 31 and COP32 will be

hosted by Turkiye and Ethiopia, respectively. India has shown interest in hosting the COP33 in the year 2028.

India plays an active role in the COP climate meetings. India supports climate action but also protects the needs of poor, vulnerable and less developed countries. India says that developed countries should take more responsibility because they caused more pollution in the past. At the Paris COP (2015), India promised to use clean energy and reduce pollution per unit at GDP. India also announced five climate goals, called Panchamrit, to fight climate change in a fair way.

1)Net zero emissions by 2070.

2)Increase non-fossil energy capacity to 500 GW by 2030.

3)50 % of India's energy needs will come from renewable sources by 2030.

4)Reduce carbon emissions by 1 billion tonnes by 2030.

5)Reduce the emissions intensity of GDP by 45% by 2030. {from 2005 levels}.

Overall, India supports climate action with fairness. It protects the interests of vulnerable groups, communities and nations. India promotes believes that climate action must go hand-in-hand with economic growth, poverty reduction and sustainable development.



**ARTICLE 10****DEVELOPMENT AND RESOURCE MANAGEMENT IN INDIA: NAVIGATING THE NEXUS OF GROWTH AND SUSTAINABILITY***TRISHA SINHA**3<sup>RD</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE*

In the lexicon of economic geography, natural resources are the fundamental natural capital assets that provide the essential raw materials for modern society. However, as established by the functionalist paradigm of E.W. Zimmermann, these substances are merely "neutral stuff" until human knowledge and technology transforms them into valuable commodities capable of satisfying material needs. For India, a nation pursuing the vision of "Vikshit Bharat" (Developed India) by 2047, the management of these finite assets have become a burning issue. The country faces the monumental challenge of supporting 16.2% of the global population on a mere 2.4% of the world's landmass, creating a condition of massive richness accompanied by even more massive pressure.

**THE FOUNDATION: UNDERSTANDING NATURAL CAPITAL**

Natural resources encompass everything from the fertile plains of the Ganga to the mineral-rich hills of central India. They are classified as biotic resources (derived from the biosphere,

such as forests and fossil fuels) and abiotic resources (nonliving entities, such as land, water, and metallic minerals). Furthermore, they are categorised by their stage of development: potential resources are known to exist but remain untapped, whereas actual resources, such as the petroleum extracted from the Mumbai High Fields, have been surveyed and are currently being exploited.

The progressive depletion of these resources occurs when they are consumed faster than they can be replaced, a critical concern for non-renewable minerals and fossil fuels that form over geological time timescales. Consequently, the world's ecological footprint is now estimated to be 1.5 times the Earth's sustainable capacity to provide for human consumption.

**LAND RESOURCES: THE "LIVING SKIN" UNDER SIEGE**

India's total geographical area of 3.28 million square kilometres is a diverse tapestry of mountains, plateaus, and fertile plains. The Indo-

Gangetic Plains are among the most productive agricultural lands globally, yet the demand for development has led to significant land resource depletion. Nearly one-third of India's land is currently affected by degradation due to soil erosion, salinisation, and desertification.

Soil is a finite resource that regenerates at an agonisingly slow rate, taking 200 to 1,000 years to form just 2.5 cm of topsoil. Despite this, the average annual erosion rate in India is 20 to 100 times faster than the renewal rate. This degradation is driven by both natural factors and anthropogenic activities, including over-irrigation, unscientific farming, and the conversion of fertile tracts for urban sprawl and infrastructure projects. To combat this, the government is implementing strategies like the National Mission for Sustainable Agriculture (NMSA) and adopting soil conservation techniques such as contour ploughing and terracing.

### **WATER: THE ELIXIR OF LIFE IN SHORT SUPPLY**

Water is the most precious resource for survival, yet only 2% of the Earth's total water is fresh and consumable. India is blessed with vast river systems like the Indus, Ganga, and Brahmaputra, but their distribution is highly uneven and monsoon-dependent. Many regions face acute

acute water scarcity due to population pressure, pollution, and climate variability. The crisis is most evident in the depletion of groundwater. Heavy withdrawal for irrigation in states like Punjab, Haryana, and Rajasthan has caused water tables to drop alarmingly, leading to issues like salinity and arsenic contamination. Furthermore, industrial effluents and untreated sewage have severely polluted major rivers like the Yamuna. Integrated water management initiatives, such as the Jal Jeevan Mission and rainwater harvesting, are critical attempts to secure India's water future.

### **FORESTS: BALANCING BIODIVERSITY AND DEVELOPMENT**

Forests cover approximately one-fifth of India's land area, acting as critical carbon sinks and biodiversity hotspots. However, the push for modernisation has led to a significant decline in forest integrity. In the early 20th century, India had 30% forest cover, which plummeted to 19.4% by the end of the century. The primary causes of deforestation include logging for timber, agricultural expansion, and mining activities. In ecologically sensitive areas like the Western Ghats, deforestation has been particularly intensive. While programs like Joint Forest Management (JFM) and Social Forestry aim to involve local communities in conservation, the tension between resource

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resource extraction (such as coal mining in Odisha and Chhattisgarh), and ecological preservation remains a central conflict.

### **MINERAL WEALTH: THE INDUSTRIAL BACKBONE**

India is exceptionally well-endowed with mineral wealth, producing 95 distinct minerals, including fuel, metallic, non-metallic, and atomic varieties.

Iron ore is the most vital metallic mineral, serving as the primary raw material for the iron and steel industry, which is the driving force behind industrialisation. India possesses over 35.29 billion tonnes of haematite and magnetite, with Odisha serving as the leading producer.

However, India's mineral landscape is characterised by geographic inequality. The peninsular shield is rich in minerals, while the Gangetic plains are largely deficient. Furthermore, while India is self-sufficient in bauxite (the ore for aluminium) and limestone (the base for cement), it faces a strategic deficiency in copper, lead, and gold, relying heavily on imports and scrap recycling to meet domestic demand.

### **THE STRATEGIC FRONTIER: CRITICAL MINERALS AND ENERGY SECURITY**

In the contemporary "Age of Electricity," the focus has shifted toward strategic and critical

minerals. India has identified 30 critical minerals, including lithium, cobalt, and rare earth elements (REEs), which are the building blocks of the "new economy". These minerals are essential for high-tech sectors, defence, and green technologies such as electric vehicle batteries.

Because India faces an extreme import dependency for many of these minerals, including 100% for lithium and 85% for cobalt, the government amended the MMDR Act in 2023 to permit private sector mining of these strategic assets. Additionally, the KABIL joint venture was established to acquire overseas mineral assets in nations like Australia and Argentina to ensure a steady supply for domestic manufacturing. Energy resources are the lifeblood of this industrial transition. Coal remains the backbone of India's energy sector, providing nearly 79% of the total energy supplied domestically in 2023-24. While India holds the world's 5th largest proven coal reserves, the environmental impact of coal has prompted an accelerated push toward renewable energy. As of March 2024, India's renewable energy potential was estimated at over 2.1 million MW, with solar energy witnessing a spectacular 30-fold increase in capacity over the last decade. Despite these gains, the nation remains vulnerable to global price shocks due to an 89% import dependency for crude oil and a

46.6% dependency for natural gas.

## TECHNOLOGICAL AND POLICY FRAMEWORKS FOR MANAGEMENT

Effective resource management in India integrates scientific planning with robust policy. The National Mineral Policy 2019 aims to enhance transparency, strengthen regulation, and promote sustainable mining practices in the sector. To address the grievances of people affected by mining, the District Mineral Foundation (DMF) and the Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) have collected nearly ₹99,100 crore for welfare projects in mining-affected areas as of 2024.

Technology plays a vital role in monitoring and conservation. The Indian Bureau of Mines (IBM) uses remote sensing and Geographic Information Systems (GIS) to monitor mining activities and detect illegal mining through the pilot project "Sudoor Drishti". Drone (UAV) technology is now mandated for annual surveys of large-scale mines to ensure compliance with scientific mining plans. Research and development efforts, supported by the SATYABHAMA portal, are also focused on the circular economy, including projects to recover valuable metals from spent batteries and industrial waste.

## THE PRINCIPLE OF INTER- GENERATIONAL EQUITY

Resource management is guided by the ethical principle of intergenerational equity, which holds that the current generation holds Earth's natural capital in trust and must not compromise the ability of future generations to meet their own needs. This principle is central to the United Nations Sustainable Development Goals (SDGs), which India has integrated into its national planning.

Key goals, such as SDG 7 (Affordable and Clean Energy) and SDG 12 (Responsible Consumption and Production), provide a pathway for balancing developmental imperatives with environmental protection. For example, adopting the 3Rs (Reduce, Reuse, Recycle) is essential; recycling one tonne of steel scrap saves 1.1 tonnes of iron ore and significantly reduces greenhouse gas emissions.

In conclusion, the dual challenges of development and resource management are inextricably linked in India's quest for economic resilience. While the nation possesses a rich endowment of natural capital, the pressures of rapid industrialisation necessitate a shift toward sustainable lifestyles and clean technologies. The

future of India's economy depends on bridging the gap between resource demand and supply while maintaining ecological stability. By harnessing new technologies, strengthening institutional frameworks, and adhering to the principle of inter-generational equity, India can ensure that its "gifts of nature" continue to

support the well-being of its citizens for generations to come. Ultimately, ensuring energy and resource security is a shared responsibility between the government, industry, and the public

to maintain the Earth's carrying capacity while pursuing national prosperity.



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**ARTICLE 11**

# DELHI'S URBAN EXPANSION AND ITS ENVIRONMENTAL CONSEQUENCES

SHAGUN SIROHI

2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE

Urban expansion is one of the most visible geographical processes in large cities across the world. In India, Delhi clearly provides an example of how rapid population growth, economic development, and migration have transformed a city's landscape. Over the past few decades, Delhi has expanded far beyond its traditional boundaries. While this growth has supported economic opportunities and improved infrastructure, it has also created serious environmental challenges. Understanding these consequences is really important for planning a more sustainable future for the city.

One of the main drivers of Delhi's urban expansion is its population growth. As the capital of India, Delhi attracts migrants from many parts of the country in search of employment, education, and better living conditions. This increasing population has led to a growing demand for housing, transportation, and other urban services. As a result, agricultural land, forests, and open spaces around the city have gradually been converted into residential

colonies, commercial centres, and industrial areas. Regions such as Gurugram, Noida, Ghaziabad, and Faridabad have developed rapidly due to this only, forming a large urban region referred to as the National Capital Region (NCR). However, this rapid expansion has significantly affected the natural environment too.

- One major consequence is the reduction of green spaces. Forest areas, parks, and agricultural fields have been replaced by concrete structures, roads, and buildings. Green spaces play an important role in maintaining ecological balance, improving air quality, and regulating temperature. Their loss has contributed to rising pollution levels and a decline in biodiversity within the region.
- Another serious environmental issue associated with Delhi's urban growth is air pollution. Increased construction activities, industrial development, and a rising number of vehicles have contributed to poor air quality in the city.

- Delhi is frequently listed among the most polluted cities in the world. High levels of particulate matter in the air have serious impacts on human health, leading to respiratory diseases and other health problems.
- Water resources have also been affected by the city's rapid growth. As more land is covered with concrete and asphalt, natural water absorption into the soil decreases. This reduces groundwater recharge and increases surface runoff. At the same time, the water demand continues to grow due to population increase. Over-extraction of groundwater has led to declining water levels in many parts of Delhi and its surrounding areas. Additionally, rivers and water bodies such as the Yamuna have faced severe pollution due to untreated sewage, industrial waste, and urban runoff.
- Urban expansion has also contributed to the Urban Heat Island effect in Delhi. This phenomenon occurs when cities experience higher temperatures than surrounding rural areas due to dense construction, limited vegetation, and heat-absorbing surfaces such as concrete and asphalt. As a result, summers in Delhi have become increasingly hot, and heatwaves are becoming more frequent and intense. This not only affects public health but also increases energy demand for

cooling.

- Waste management is another challenge linked to urban growth. With an increasing population and consumption levels, the amount of solid waste produced in the city has risen significantly. Landfills such as Ghazipur, Bhalswa, and Okhla have expanded rapidly and now pose environmental and health risks to nearby communities. Improper waste disposal can contaminate soil, water, and air, further contributing to environmental degradation.

Despite these challenges, there are opportunities to make urban growth more sustainable. Urban planning that prioritizes green spaces, public transportation, and efficient waste management can reduce environmental pressure. Expanding metro networks, promoting renewable energy, protecting urban forests, and improving sewage treatment systems are some steps that can help balance development with environmental protection.

In conclusion, Delhi's urban expansion reflects both the opportunities and challenges of rapid urbanization. While the city's growth has supported economic development and improved connectivity, it has also placed significant stress on the natural environment. Issues such as air pollution, water scarcity, loss of green spaces, and rising temperatures highlight the need for sustainable urban planning. Addressing these

environmental consequences is essential for ensuring that Delhi remains a livable city for future generations.



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**ARTICLE 12****GEOGRAPHY OF MILITARY IN INDIA***ABHISHEK MISHRA**2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE*

**Military geography means the study of how land, sea, air, climate and human settlement affect the defence and security of a country. For India, geography is one of the most important parts of national defence. The shape and position of India determine its challenges and strengths. The land of India stretches from the high, cold mountains in the north to the warm tropical sea in the south. It has plains, deserts, forests, rivers and a long coastline.**

Each type of land gives the military different problems and benefits. India lies in South Asia and shares borders with Pakistan, China, Nepal, Bhutan, Bangladesh and Myanmar. It also touches two large water bodies, which are the Arabian Sea in the west and the Bay of Bengal in the east. Because of this, India has to defend both land and sea frontiers. The country's borders and seas make it a bridge between the Middle East, Central Asia and Southeast Asia. This position gives India an advantage for trade and influence, but it also exposes it to different

kinds of security threats from both land and sea.

The northern part of India is guarded by the mighty Himalayas. These mountains are some of the highest and roughest in the world. They act as a natural wall and protect the country from large-scale invasions. The Himalayas also stop cold winds and provide the source for many rivers like the Ganga and Brahmaputra. But these same mountains are also difficult for defence operations. The terrain is steep, the weather is freezing, and snowfall can cut off areas for months. Soldiers must live in tough conditions where the air is thin, and the temperature falls below zero. The military has to move supplies and build roads and tunnels in dangerous places. High passes like Nathu La, Shipki La and the Karakoram are key for movement and observation. Because of their importance, India has built a strong infrastructure and keeps troops stationed there all year. The 1962 war with China

showed how important the northern geography is. Since then, India has strengthened its border defence with better roads, airports, radars and surveillance systems. The mountains may look peaceful from afar, but they are one of the most tense and sensitive regions in Asia, where every peak and valley has military meaning.

To the northwest lies the border with Pakistan. This border runs through plains, deserts and mountains. It is one of the most active borders in the world. The Line of Control in Jammu and Kashmir remains an area of regular tension. The land here changes quickly from flat farmland to rocky hills and deep valleys. This affects how the army plans its operations. In the plains armored divisions and tanks are used. In the mountains infantry troops with light weapons take the lead. The desert of Rajasthan is another special region for defense. It looks empty but it allows fast movement of vehicles and equipment. The Indian Army conducts large military exercises here to practice mobile warfare. The climate in this region is very dry and soldiers must deal with heat and dust. The long border also means a need for constant patrolling and monitoring. To keep control India has built fences roads and outposts. The air force also plays a big role in watching and defending the western border. The eastern and northeastern regions of India have very different geography. The land here is full of hills,

forests, and rivers. Rainfall is heavy, and the soil is soft. The thick vegetation and steep terrain make travel and communication difficult. The Siliguri Corridor is a narrow piece of land that connects the main part of India to its northeastern states. This small stretch is also called the Chicken's Neck because of its shape and size. It is only about twenty-five kilometres wide at its narrowest point. This area is very important because if anything happens there the whole northeast could be cut off from the rest of India. So the military gives this region special attention. The northeast itself has many small valleys and tribal regions. Some of these areas have faced unrest and insurgency. The army and paramilitary forces work there to maintain peace and stability. The rough landscape makes these operations difficult. But it also provides a natural barrier that prevents easy movement by any foreign force. India has built new roads, bridges and airfields to improve access and support both defence and development in this part of the country. The eastern borders with Myanmar and Bangladesh also have strategic importance because of trade routes and cross-border security issues. In the south, India stretches into the Indian Ocean. The shape of the country gives it a powerful position over the sea routes that connect Asia, Africa, and the Middle East. This ocean is vital for trade and energy supply. Many of the world's important shipping lanes pass

through it. The Indian Navy protects these sea lanes and ensures that no enemy controls them. The navy also guards India's long coastline, which is more than seven thousand kilometres long. There are major naval bases in Mumbai, Kochi, Visakhapatnam and Port Blair. The Andaman and Nicobar Islands are very special for defence. They are located near the Strait of Malacca, which is one of the busiest sea passages in the world. From these islands, India can watch the movement of ships and maintain a presence in the eastern Indian Ocean. The Navy also works with other countries like the United States, Japan and Australia through exercises and partnerships. These help India build strength and keep peace in the Indo-Pacific region. The southern seas are not only about war but also about trade safety and disaster response. The Indian Navy helps with rescue operations and protects fishermen and trade ships from pirates and threats.

Geography also affects how the military trains and equips its forces. The Himalayas need soldiers who can fight in high altitude and cold weather. The desert needs training for heat and open movement. The forests of the northeast require skills for jungle warfare. India has special training schools for all these environments. The High Altitude Warfare School in Gulmarg and the Counter Insurgency and Jungle Warfare

School in Mizoram are well-known examples. The Border Roads Organisation builds roads and tunnels to help the army move faster. The Atal Tunnel in Himachal Pradesh allows travel to Ladakh even in winter. Airfields in border regions help in quick deployment. Rivers like the Indus, Ganga and Brahmaputra have their own military importance because they flow from or into neighbouring countries. The Indus Waters Treaty between India and Pakistan shows how control over rivers has both strategic and political effects. Similarly the Brahmaputra which starts in Tibet is linked with China and Bangladesh. The control of water and land is part of a larger defense plan.

In modern times, new technology has changed military geography but not removed its importance. Satellites, drones and radars help the army watch borders and plan ahead. But soldiers still need to deal with terrain and weather. India's location makes it both vulnerable and powerful.

It lies close to global trade routes and near regions with long-term conflict. Because of this, India must always keep its forces ready. The future will bring new challenges like climate change, melting glaciers, rising sea levels and changing weather. These can affect rivers' borders and coastal bases. India will need to adapt to these changes while keeping its focus on peace and stability. The study of military

military geography will remain vital for planning and strategy. The land, the sea, the air and the people all shape how India protects itself. From the high Himalayas to the blue waters of the

Indian Ocean geography defines India's defense story. It is a story of endurance adaptation and strength built on understanding the power of the land.



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**ARTICLE 13****GEOSPATIAL TECHNOLOGIES IN  
MODERN GEOGRAPHY***PRIYANSHU ARYA**2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE*

**Geography is not about maps and landforms like it used to be. Now it is a field that uses a lot of technology to help us understand how people and places interact with the environment. There are some important tools that are changing the way we study geography.**

These tools are called Geographic Information Systems, Remote Sensing, and Geospatial Technologies. Geographic Information Systems, Remote Sensing, and Geospatial Technologies have changed the way we collect and analyse data. They have also made the field of geography a lot bigger. Geography is a lot more complex now because of Geographic Information Systems, Remote Sensing, and Geospatial Technologies.

In geography, these tools play a big part in looking at how the environment is changing, how cities are growing, and how we manage our resources. They are also important for dealing with disasters and making sure we develop in a

way that is good for the Earth. Geography is really important for development and for understanding how to make our planet a better place.

This article is about what GIS, Remote Sensing, and Geospatial Technologies mean, how they work, and why they are important. It also talks about how GIS, Remote Sensing, and Geospatial Technologies are really necessary for studying geography in today's world.

**UNDERSTANDING GIS IN MODERN  
GEOGRAPHY:**

The Geographic Information System, or GIS, is a computer system that people use to gather information about the Earth. This system stores the information, looks at it, and then shows it to us. What is special about GIS is that it connects a place to the information about that place. So GIS helps people who study the Earth understand things like where something is, why it is there, and what happens to it over time. In the field of geography today, GIS is used to put different

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kinds of information on top of a map. For example, population data can be combined with land-use patterns, roads and transportation systems, or even climate data to look at patterns in a certain area. This way of layering information on a map really helps people who study geography see how things are related to each other. A Geographic Information System is used a lot in the study of the Earth and the people who live on it. When we look at the Earth, GIS helps us learn about the shape of the land, where the water flows, how the soil is spread out, and what the weather is like. When we look at people, GIS helps us understand how cities are growing, how many people live in an area, why people move from one place to another, and what kinds of work people do. By using GIS, people who study the Earth and its people can make decisions and help plan for the future.

### **REMOTE SENSING: OBSERVING THE EARTH FROM A DISTANCE**

Remote Sensing is a way to learn about the Earth without touching it. We use things like satellites, drones, and aeroplanes. These have tools known as sensors that help us get information. Remote Sensing uses these sensors to take pictures of the Earth by seeing the energy that bounces off or comes from the Earth's surface. Remote Sensing plays a very crucial and important role in geography because it gives us a

of current information. Remote Sensing can be used to learn about places that are hard to reach, such as forests, deserts, glaciers, and oceans. Remote Sensing is a scientific technique used a lot to look at changes in the environment, like forests being cut down, glaciers melting, deserts getting bigger, and changes in water bodies. It also helps people predict the weather, study the climate, and watch out for disasters. When there are floods, cyclones, or forest fires, satellite information helps people understand the damage and decide how to help.

### **GEOSPATIAL TECHNOLOGIES: AN INTEGRATED APPROACH**

Geospatial Technologies include GIS, Remote Sensing, the Global Positioning System (GPS), and mapping tools. These technologies help us collect data, manage it, analyse it, and present it in a way that makes sense. In geography today, geospatial technologies allow us to collect information with accuracy and locate exact geographical locations. GPS helps us know our exact location on Earth. When GPS information is used along with GIS and Remote Sensing, it creates strong tools to study space and understand it in a better way. These technologies help people to make decisions in areas like farming, transportation, city planning, environmental protection, and public health. When they are used together, geography

becomes more useful and helps solve real problems.

### **ROLE OF GIS AND REMOTE SENSING IN ENVIRONMENTAL STUDIES**

One of the most important contributions of GIS and Remote Sensing in modern geography is in environmental studies, especially in a country like India, where environmental diversity and pressure on resources are very high. GIS is useful for mapping forests, water bodies, minerals, and soil types. In India, GIS is used to monitor forests through surveys and biodiversity protection programmes. GIS also helps in studying how projects like highways, dams, and mining affect the environment by comparing conditions before and after these projects.

Remote Sensing provides information about environmental change over time. Satellite data from missions such as INSAT and Cartosat help us to study deforestation in the Western Ghats, glacier changes in the Himalayas, and changes in rivers across the Indo-Gangetic plains. Satellite images also help us understand problems like climate change, rising sea levels, shrinking ice caps, biodiversity loss, and pollution. GIS helps identify areas and people that are most affected by these changes.

### **APPLICATION IN URBAN AND REGIONAL PLANNING**

Urban areas are growing very fast, especially in developing countries like India. GIS and geospatial technologies are very important for planning cities and regions because they provide accurate information about space. In geography today, GIS is used to study land use, transportation systems, housing, and public services. Cities like Delhi, Mumbai, and Bengaluru use GIS for property mapping, traffic management, and planning infrastructure. GIS also helps the government find areas that need better facilities.

Remote Sensing gives satellite images that show how cities are expanding, how green spaces are reducing, and how land use is changing. These images help planners and geographers make cities more sustainable and fair for everyone.

### **DISASTER MANAGEMENT AND RISK REDUCTION**

Disaster management is an important area where GIS and Remote Sensing are used in modern geography. Natural disasters like floods, earthquakes, landslides, and cyclones affect different places in different ways.

In India, GIS is widely used for hazard mapping and risk assessment in flood-prone areas like Assam and Bihar, and in cyclone-prone coastal regions such as Odisha and Andhra Pradesh.

Remote Sensing provides early warning information by closely and continuously

monitoring rainfall, cyclones, river levels, and various atmospheric parameters. After disasters, satellite images and their various elements or components help to assess damage and plan relief work. This signifies the crucial importance of geography and technological help to protect lives and reduce losses.

### **IMPORTANCE IN AGRICULTURE AND RESOURCE MANAGEMENT**

In today's modern world, geography is closely linked with technology. In agriculture, GIS and Remote Sensing are used to monitor crops, study soil, plan irrigation, and also help in better estimation of crop production. Satellite images help detect crop stress, pests, water stress, and other disruptions.

Geospatial technologies also support the management of water, forest, and energy resources. Collecting information and knowing where these resources are and how they are used helps in better planning and conservation, or helps in environmental sustainability.

### **GIS, REMOTE SENSING, AND THE FUTURE OF GEOGRAPHY**

The role of GIS, Remote Sensing, and geospatial technologies in geography is rapidly increasing day by day or as per modern times. With continuous technological innovations and advancements, better satellites, artificial

intelligence, and data analysis, geographical studies are becoming more accurate and faster. Modern geography is connected with subjects like environmental science, economics, public health, and urban studies. Geospatial technologies work smoothly in bringing these fields together. For students and researchers of geography, learning and adapting these tools is very important for a better understanding. These skills improve understanding and create more opportunities in academic and practical fields.

### **CONCLUSION**

GIS, Remote Sensing, and Geospatial Technologies have changed geography into a more practical and useful subject. They have improved the way geographical information is collected and used. In modern geography, these technologies help us deal with environmental problems, urban growth, disasters, and sustainable development. As global challenges increase, GIS, Remote Sensing, and geospatial technologies will become even more important in the future of geographical studies.



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**ARTICLE 14**

# EVERYDAY LIFE IN THE ERA OF CLIMATE CHANGE

ABHIMANYU KUMAR

2<sup>ND</sup> YEAR, B.A(H) GEOGRAPHY, SHIVAJI COLLEGE

*“Climate change is not just an environmental issue; it is a challenge that shapes our economy, health, and everyday lives.”*

Climate change has emerged as one of the most significant environmental challenges of the 21st century. It refers to long-term changes in temperature, precipitation, and other climatic conditions on Earth. According to the Intergovernmental Panel on Climate Change (IPCC), the average global temperature has already increased by about 1.1°C above pre-industrial levels due to human activities. The primary causes include the burning of fossil fuels, deforestation, rapid industrialisation, and unsustainable consumption patterns. Although climate change is often discussed at the global policy level, its impacts are increasingly visible in the everyday lives of people around the world.

One of the most noticeable effects of climate change is the rise in global temperatures. Heatwaves are becoming more frequent and intense in many regions. India, for example, has

experienced a sharp increase in extreme heat events over the last two decades.

Cities such as Delhi regularly record summer temperatures above 45°C, making daily activities extremely difficult for residents. High temperatures not only cause discomfort but also increase the risk of heatstroke, dehydration, and other health issues. Furthermore, the demand for electricity increases significantly during heatwaves due to the widespread use of air conditioners and cooling systems. This leads to higher energy consumption and greater pressure on power infrastructure.

Changes in rainfall patterns are another important consequence of climate change. In many regions, rainfall has become irregular and unpredictable. Some areas experience prolonged droughts, while others receive heavy rainfall within a short period. According to data from the World Meteorological Organization, extreme

rainfall events have increased significantly in many parts of the world over the past few decades.

These changes directly affect agriculture, which is highly dependent on stable climatic conditions. In India, nearly 50–55% of agricultural land is rain-fed, meaning that farmers depend heavily on monsoon rainfall for crop production. When the timing or intensity of rainfall changes, crop yields can decline, affecting both farmers' incomes and national food security.

Urban areas are also facing serious challenges due to climate change. Rapid urbanization, combined with extreme rainfall events, has increased the frequency of urban flooding. Natural drainage systems are often blocked by construction, roads, and buildings, preventing rainwater from being absorbed into the ground. As a result, even a few hours of heavy rainfall can cause severe flooding in cities. For instance, cities such as Mumbai and Bengaluru have experienced major urban floods in recent years. In 2005, Mumbai received 944 mm of rainfall in a single day, one of the heaviest rainfall events recorded in India. Such events disrupt transportation systems, damage infrastructure, and affect the daily lives of millions of people. Climate change also has significant implications for human health. Rising temperatures and \

changing environmental conditions can increase the spread of vector-borne diseases such as dengue, malaria, and chikungunya. Warmer climates provide favourable conditions for mosquitoes and other disease carriers. According to the World Health Organization, climate change could cause approximately 250,000 additional deaths per year between 2030 and 2050 due to heat stress, malnutrition, malaria, and other climate-related health issues. In addition, increased air pollution during heatwaves can worsen respiratory problems, particularly in densely populated urban areas.

Water resources are another area where the effects of climate change are clearly visible. Glaciers in mountainous regions are melting at an accelerated rate due to rising temperatures. The Himalayan region, often referred to as the "Water Tower of Asia," supplies water to several major rivers that support millions of people. Studies indicate that many Himalayan glaciers have been shrinking rapidly over the past few decades. At the same time, irregular rainfall and increased evaporation are contributing to water scarcity in several regions. In many cities and rural areas, people are already facing shortages of clean drinking water, which affects their everyday lives.

Coastal regions are particularly vulnerable to

to climate change because of rising sea levels. According to the National Aeronautics and Space Administration, global sea levels are rising at an average rate of about 3.3 millimetres per year. This may appear small, but over time it can lead to serious consequences such as coastal erosion, flooding, and saltwater intrusion into freshwater resources. Coastal communities that depend on fishing, agriculture, and tourism are especially at risk. Infrastructure such as roads, ports, and housing in coastal areas may also be damaged due to rising sea levels and stronger storms.

Climate change is also influencing migration patterns across different regions. When environmental conditions become extremely harsh due to droughts, floods, or declining agricultural productivity, people may be forced to move in search of better living conditions. This phenomenon is often referred to as climate-induced migration. According to estimates by the World Bank, over 200 million people could be internally displaced by climate change by 2050 if effective action is not taken. Such large-scale migration can create economic and social pressures on urban areas and other receiving regions.

From a geographical perspective, climate change highlights the complex relationship between physical processes and human activities. Modern

technologies such as Geographic Information Systems (GIS) and remote sensing have become essential tools for monitoring environmental changes. These technologies allow scientists to analyse climate data, identify vulnerable regions, and support disaster management strategies. For example, satellite imagery can help track deforestation, monitor glacier retreat, and assess flood-prone areas.

Despite the seriousness of climate change, there are several efforts being made to address this global issue. Many countries are promoting renewable energy sources such as solar, wind, and hydropower in order to reduce greenhouse gas emissions. Sustainable urban planning, improved waste management, and the development of green infrastructure is also an important strategy for building climate-resilient cities. International agreements and cooperation between countries play a vital role in addressing climate change at the global level.

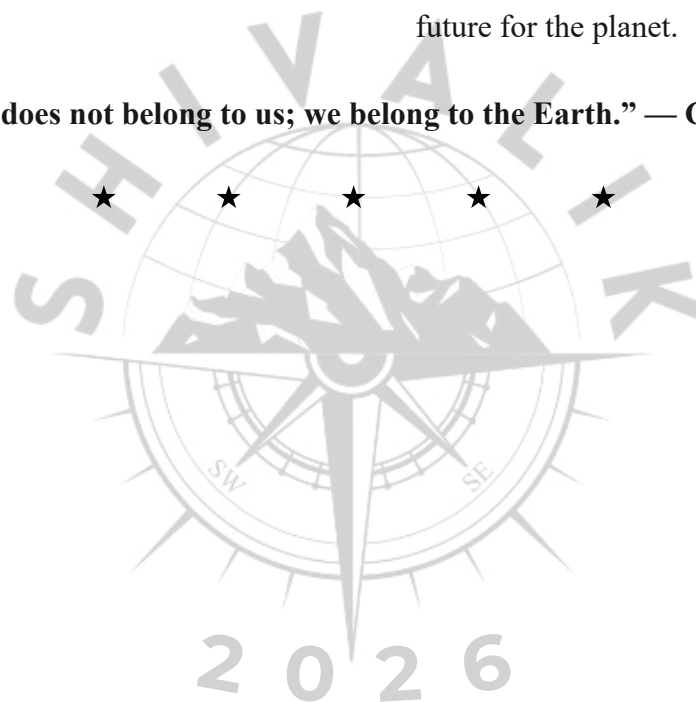
Individuals also have an important role in reducing the impacts of climate change. Simple actions such as conserving electricity, reducing the use of plastic, planting trees, and using public transportation can contribute to environmental sustainability. Awareness and education are particularly important among young people, as they will become the future leaders, researchers,

and policymakers responsible for managing environmental challenges.

In conclusion, climate change is no longer a distant environmental issue but a reality that affects everyday life across the world. Rising temperatures, irregular rainfall, urban flooding, health risks, water scarcity, and sea-level rise are some of the major challenges associated with climate change.

Addressing these challenges requires coordinated efforts at the local, national, and global levels. For students of geography, understanding climate change is essential because it reveals how environmental processes shape human societies and spatial patterns of development. By promoting sustainable practices and responsible environmental management, humanity can work toward building a more resilient and sustainable future for the planet.

**“The Earth does not belong to us; we belong to the Earth.” — Chief Seattle**



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**ARTICLE 15**

# THE ARAVALLI'S, THE RANN, AND EVERYTHING IN BETWEEN

PRANAV SETHI

3<sup>RD</sup> YEAR, B.A. PROGRAMME, SHIVAJI COLLEGE

Recently, I drove from Delhi to the Rann of Kutch for the annual Rann Utsav. We started at 4 a.m. on a foggy January morning, taking the newly constructed Delhi–Mumbai Expressway. The road slices through fields and what remains of the Aravalli's. Until you travel this stretch, you don't quite grasp their significance. Anyone who has been to Alwar or Sariska knows how these hills shape the region, marked by forests, small rivers, and a distinct topography now slowly disappearing.

After a short halt in Jaipur, we continued towards Udaipur via the Golden Quadrilateral, a highway I had only ever encountered in textbooks. Driving on it felt oddly satisfying, like watching theory come alive. Geography, when experienced on the ground, suddenly feels less abstract.

Like most modern travellers, we relied on Google Maps, and like many before us, paid the price. Near Bhilwara, it nudged us onto smaller state highways. Rajasthan's roads are decent,

but poorly lit and riddled with unmarked surprises. Driving there felt less like transport and more like a video game where obstacles appear without warning.

As we approached Udaipur, the Aravalli's rose higher. On either side of the road were endless marble quarries and crushers. Dust hung in the air, settling into a pale yellow film on our car. It reminded me of an advertisement where dust was portrayed as a sign of development. But once you understand where the dust comes from, you begin to question what kind of development this really is.

We reached Udaipur by evening and stayed near Fateh Sagar Lake. The lake, fed by the Aravalli's, is the city's lifeline. Without the hills, the water disappears, and with it, the city. Geography here is not theory, it is survival.

The next morning, we left at 5 a.m. for

Dholavira. The road through Mount Abu was dark and winding, confirming the terrain even before daylight revealed it. At the Gujarat border, our Delhi number plate caused visible excitement. The police searched the car thoroughly, a reminder of how people from Delhi NCR is perceived outside its borders.

Gujarat's highways, despite the state's industrial strength and port connectivity, were rough. Heavy truck traffic had warped the roads into deep grooves. As we entered the Rann region, Google Road through heaven Maps again diverted us onto village roads dotted with unmarked pits and dramatic speed breakers that could probably launch a satellite without Elon Musk's help.

Eventually, we reached the narrow bund road where the Rann begins. Wind pushed against the car, and as far as the eye could see stretched a flat, pale yellow expanse, water shimmering on either side. By afternoon, we arrived in Dholavira, a remote village with weak connectivity and petrol pumps 50 kilometres away. Dholavira archaeological site. The Dholavira archaeological site, dating back to 2500 BCE, was both fascinating and disheartening. The remnants of the Harappan civilisation lay exposed to crowds who treated history like a souvenir shop. It felt like watching

a legacy quietly erode.



Figure 1: Dholavira  
(Photograph: Author)

A nearby fossil park told a deeper story. Sandstone formations resembling the Grand Canyon held petrified wood from the Jurassic era, proof that this barren land was once forested and river-rich. The Aravalli's, which begin near Delhi, stretch all the way here. Destroying them is not just environmental damage, it is historical amnesia.

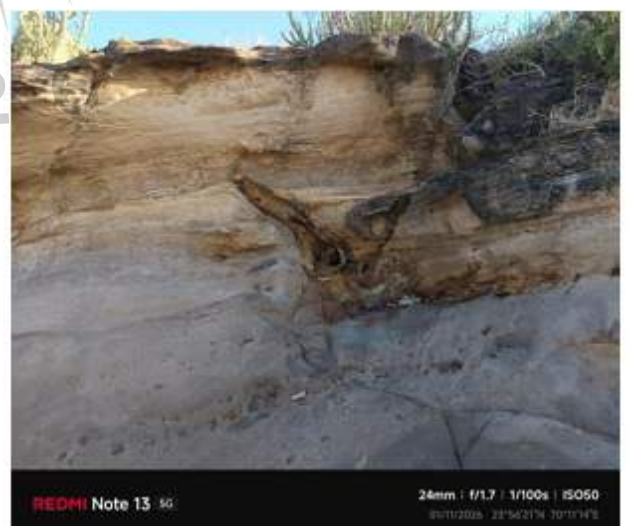


Figure 2: Petrified Wood  
(Photograph: Author)

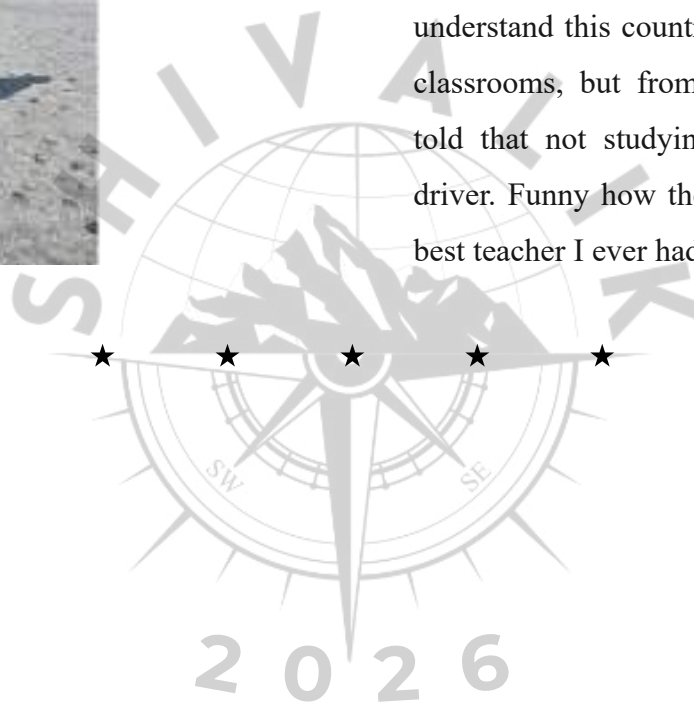
a luxury Delhi no longer offers. Petrified wood. The following day, we drove to the White Rann. The hype of the Rann Utsav fell short, but the land itself did not. I tried explaining the marshy salt flats to my wife, how salt forms, and how walking straight for hours would still keep you firmly within India. Rann of Kutch.



Figure 3: Rann of Kutch  
(Photograph: Author)

On our return journey, Google Maps once again sent us into the unknown, pushing us off expressways and onto deserted state highways. Eventually, we skipped Jodhpur and reached Ajmer, and headed back to Delhi the next day.

Crossing back into the city was depressing. Pollution, noise, traffic, and chaos welcomed us home. Sometimes, I think the best way to understand this country is not through reports or classrooms, but from behind the wheel. I was told that not studying would make me a taxi driver. Funny how the road turned out to be the best teacher I ever had.



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**ARTICLE 16****TALES OF FAULTING***MANSI SINGH**1<sup>ST</sup> YEAR, B.A(H) GEOGRAPHY, IPCW*

The massif of hue  
Flakes of white  
Enveloping the sacred  
The world whipped  
The story follows,  
Once a small giant was bellowing  
As he was separating from his beloved  
The majestic king was roaring in all stunned  
How, he can be separate  
But he didn't know  
What!  
The philosophy of geography is always dynamic  
Splitting called as fraction of lands migrate  
But who says it was just the migration  
The king's ripped the world  
But didn't able to come back  
Met with another dearest  
Ruins of his beloved is still found till date  
No one knows what?  
That Not a, soul can erase the thing in fate.  
People goes, people comes  
The nature thrives and survive  
But does anyone really ask what happen to the king?  
Waiting the chance when hell of fire would come  
Everyone comprehends  
Touch her and die but when it just means "let me meet her once "  
That SHE is the KING's LUNGS.

★ ★ ★ ★ ★

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# GEOGRAPHY THROUGH THE LENS



EXPLORING THE UNIQUE ALPINE FLORA OF THE VALLEY OF FLOWERS NATIONAL PARK.

Proud to capture this UNESCO World Heritage site in its peak July bloom.

PHOTO CREDIT: AMAN, SECOND YEAR, BA (HONS) GEOGRAPHY



THE BIRTHPLACE OF THE HOLY GANGA

Even in the July monsoon, the distinct meeting of the Alaknanda and Bhagirathi at Devprayag is a sight to behold. A true geographical marvel.

PHOTO CREDIT: AMAN, SECOND YEAR, BA (HONS) GEOGRAPHY



**THE RHYTHM OF RURAL LIFE.**

A beautiful glimpse into daily agrarian routines as a couple works together to prepare fodder for their livestock using a traditional hand-cutting machine. A perfect snapshot of human-environment interaction!

PHOTO CREDIT: YUMNAM DICSON SINGH, THIRD YEAR, BA (HONS) GEOGRAPHY



**A GLIMPSE OF PRISTINE ECOLOGY!**

The Chambal River remains a vital sanctuary for the critically endangered Gharial. A great reminder of the raw, untamed biodiversity thriving in our river ecosystems.

PHOTO CREDIT: PIYUSH KUMAR, THIRD YEAR, BA (HONS) GEOGRAPHY



### URBAN POVERTY: REFLECTED IN AGEING.

A poignant look at life on the margins of the city, where the rapid pace of urban development often leaves the most vulnerable behind. A quiet moment of struggle on the streets.

PHOTO CREDIT: REDEEMA MANDAL, SECOND YEAR, BA (HONS)  
GEOGRAPHY



### THE CITY MOVES FORWARD ON THE STRENGTH OF UNSEEN WORKERS.

Behind every delivery and every stocked shelf is the grit of those who pull the weight of the urban economy by hand. A raw look at the labor that keeps our streets alive.

PHOTO CREDIT: REDEEMA MANDAL, SECOND YEAR, BA (HONS)  
GEOGRAPHY

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# ANNUAL REVIEW OF THE EVENTS FOR THE YEAR 2025-26

## LONG EXCURSION TRIP TO BAROT VALLEY

Students of B.A. (Hons.) Geography 3rd year visited the Barot (Uhl river valley) valley in the Lesser Himalayas in Himachal Pradesh as part of a 4-day well-packed programme. Five teachers and 54 students visited to study natural disaster management in a high-altitude region under the guidance of Dr. Tejbir Singh Rana (Tour Incharge), Dr. Prabudh Kumar Mishra, Dr. Amit Srivastava, Dr. Usha Rani, and Dr. Mukesh Kumar Meena. It was hands-on learning with nature and its stakeholders. Students observed the mechanisms of landslides, creeping, mudslides, earth flows, and rockfalls during the visit to the valley. Students conducted a survey in two different villages, one in the valley of the Uhl river and the other in a high-altitude village. Students learned about the different sources of livelihood and dependency on coarse grains in high-altitude, rough terrains with limited modes of mobility. Most importantly, learning about the indigenous knowledge system and its adaptability in high-altitude, disaster-prone regions remained highly instrumental for the local people. The dependency on livestock, mainly sheep and goats, and dryland farming of coarse grains and oilseeds, in accordance with the natural conditions, gave students insights into adaptability to natural regions.



## FRESHER'S PARTY 2025 – SHIVALIK

On November 3, 2025, SHIVALIK organized a lively Fresher's Party at Chanakya Sabhagar, Shivaji College, to welcome the 2025–29 batch. The event brought together seniors and freshers in a vibrant atmosphere filled with enthusiasm, performances, and engaging activities. The celebration created a warm and joyful environment, helping the new students feel welcomed and connected with the SHIVALIK community from the very beginning.

The theme of the event, "Ethnic Extravaganza," added a unique cultural charm as students showcased traditional attire with elegance and confidence. The celebration highlighted creativity, talent, and the spirit of togetherness among the participants. Various titles were awarded to recognize the participants' enthusiasm and individuality. Divyansh Kr. Chaudhary and Himanshi were honored as Mr. Fresher and Ms. Fresher, while Prince Prajapati and Raji Arumugam received the titles of Mr. Talented and Ms. Talented. Anuj Sheoran and Shristi Gaur were awarded Mr. Popular and Ms. Popular, and Shaurya Pratap Singh and Chitralli Kaushik were recognized as Mr. Well-Dressed and Ms. Well-Dressed.

The event concluded on a cheerful note, leaving the freshers with memorable moments and marking the beginning of new friendships and experiences within the department.



## GEO – QUEST

On 26 September 2025, SHIVALIK organized Geo-Quest, an engaging quiz competition designed to test and celebrate students' geographical knowledge. The event featured five dynamic rounds that challenged participants' understanding of diverse geographical concepts, requiring quick thinking, analytical ability, and strong recall skills. Through this intellectually stimulating competition, students were encouraged to connect different geographical ideas and deepen their appreciation for the subject. The quiz witnessed enthusiastic participation and thoughtful responses from the contestants, making it both competitive and enriching. The event concluded with the recognition of outstanding teams who demonstrated exceptional knowledge and teamwork.

### Winners:

**1st Place:** Pallavi Sahu, Shourya Ranjan, and Anshul Gupta (2nd Year)

**2nd Place:** Shreya and Harsh (3rd Year)

**3rd Place:** Rajhi, Sanjana, and Sneha (1st Year)



## GEO – VERSUS

A debate competition was held on 14 October 2025 on the thought-provoking topic, “Countries that lead in AI will dominate the 21st century.” The event proved to be highly engaging and intellectually stimulating, encouraging students to present their perspectives with clarity and confidence. Participants demonstrated strong critical thinking and analytical abilities while discussing the growing influence of Artificial Intelligence on global power dynamics, economic development, and technological progress.

The debate provided an excellent platform for students to articulate their ideas, evaluate diverse viewpoints, and understand the broader implications of AI in shaping the future world order.

### Winners:

**1st Place:** Shorya Ranjan (2nd Year)

**2nd Place:** Abhimanyu Singh (2nd Year)

**3rd Place:** Anshu Gupta (2nd Year)



## GIS WORKSHOP

On January 29, 2026, SHIVALIK, in collaboration with SWASTIC Edustart, organized a GIS Workshop at Peshwa Bajirao Sabhagar on the theme “AI Tools in Geographical Studies.” The session was conducted by Dr. Bratiti Dey, who highlighted the growing importance of Artificial Intelligence in the field of geography, particularly in research and corporate sectors. The workshop aimed to familiarize students with emerging technological tools and their applications in geographical analysis. During the session, participants were introduced to Python programming, GeoAI tools, and the expanding scope of geoinformatics and spatial data analysis. Through insightful discussions and practical perspectives, the workshop helped students understand how digital innovations are transforming geographical studies and opening new career opportunities. By integrating geography with artificial intelligence and modern technology, the session effectively demonstrated how the discipline is evolving in the era of advanced geospatial technologies.



## LONG EXCURSION TRIP TO MORENA MADHYA PRADESH

From February 15 to 18, 2026, 48 students of B.A. (Hons.) Geography 3rd year and faculty members conducted an intensive academic field study in Morena, Madhya Pradesh, under the guidance of Dr. Tejbir Singh Rana (Tour Incharge), Dr. Prabudh Kumar Mishra, Dr. Usha Rani, and Dr. Mukesh Kumar Meena. focusing on the critical theme of Hydrological Disaster Management in the Chambal Region. The expedition kicked off with a transition from Delhi to Morena, where students initially engaged in topographical orientation to understand the unique ravine ecosystem of the district. The core of the research was centred on a survey visit to the flood-affected villages of the Kisroli Village. Here, participants conducted primary surveys and interviewed local residents to document the socio-economic impacts of the Chambal River's seasonal volatility and the efficacy of traditional versus modern disaster mitigation practices. This technical exposure was balanced by an exploration of the region's profound architectural heritage, featuring the circular Chausath Yogini Temple at Mitawali and the sprawling, restored temple complex at the Bateshwar Archaeological Site, which provided a historical context to human settlement patterns in high-risk zones. The visit concluded on February 18 following a final curation of local museum artifacts, bridging the gap between theoretical classroom models and the practical, lived realities of riverine disaster management and cultural preservation.



