



**International Journal of Humanities &
Social Science: Insights & Transformations**
<https://www.eurekajournals.com/humanities.html> (ISSN: 2581-3587)
DOI: <https://doi.org/10.52416/IJHSSIT.2026.11202>

Paradise under Pressure: Human-Driven Ecological Change in Kashmir, 1971-2026

Dr. Ashish Kaul¹

¹Consultant and Industry Expert, Communication and Strategy, Author of Seven Bestseller Books.

Abstract

This paper examines how human development, demographic change, urbanisation, infrastructure, tourism, land-use transformation and environmental mismanagement have altered the ecological integrity of the Kashmir Valley between the 1971 baseline and 2026. It applies qualitative and quantitative content analysis to seven purposively selected documents: a state climate action plan, a multi-system environmental synthesis, a peer-reviewed glacier study, an academic commentary, an NGO field report and two journalistic expert accounts. Evidence is coded within a Driver-Pressure-State-Impact-Response (DPSIR) framework. The documents report population growth of 274% (1971-2026), built-up expansion of 560% (1972-2020), tourism growth of 1,500% (1975-2025), glacier-area loss of 28.8% (1980-2018) and snow-cover decline of 45.7% (1990-2022). These local pressures compound regional warming of about 1.2°C per century, producing record heat, water stress, lake eutrophication and agrarian change. The evidence points to a governance gap more than a knowledge gap. Without carrying-capacity planning, the Valley risks crossing ecological thresholds before 2050.

Keywords: Kashmir Valley; ecological integrity; urbanisation; land-use change; DPSIR framework; climate vulnerability.

Introduction

The Kashmir Valley is a high-altitude intermontane basin whose ecology rests on snow, glaciers, wetlands and forests. Roughly 65% of the water used in Kashmir comes from snow and glaciers (Zargar, 2024). That dependence makes the Valley unusually sensitive to both global warming and local misuse of land and water.

Since 1971 the Valley has experienced rapid population growth, horizontal urban sprawl, road and hotel construction and mass tourism. The State Action Plan on Climate Change describes Dal and Wular lakes shrinking to roughly half their size in about fifty years (Government of Jammu & Kashmir [GoJK], 2013). Recent summers have broken temperature records, with Srinagar reaching 37.4°C in July 2025, its hottest July day since 1953 (Majid, 2025).

Existing writing tends to treat these changes sector by sector. This paper instead reads the policy, scientific and grey literature together, asking whether the separate signals add up to a systemic loss of ecological integrity.

Objectives

1. To quantify, from documentary evidence, the scale of demographic, urban, tourism and land-use change in the Kashmir Valley between the 1971 baseline and 2026.
2. To analyse how these human pressures have interacted with climate change to alter the Valley's cryosphere, water bodies, forests, agriculture and human wellbeing.
3. To assess the likely future trajectory and the governance responses the documents propose.

Research questions

1. How profoundly have development, demographic change, urbanisation, infrastructure, tourism and land-use transformation altered Kashmir's ecological integrity since 1971?
2. What environmental and social consequences do the documents attribute to these changes?
3. What future do the documents project, and which responses do they identify as necessary?

Theoretical Framework

The study combines three complementary lenses.

DPSIR. The Driver-Pressure-State-Impact-Response model of the European Environment Agency links socio-economic forces to environmental outcomes and policy reactions (Smeets & Weterings, 1999). Here, drivers are population growth, economic aspiration and tourism demand; pressures are construction, encroachment, vehicle use, sewage and water extraction; states are the condition of glaciers, lakes, forests and air; impacts fall on livelihoods and health; responses are plans, regulations and community action. DPSIR also serves as the coding frame for the content analysis.

Socio-ecological resilience. Holling (1973) defined resilience as a system's capacity to absorb disturbance and retain its essential structure. A healthy Valley can be pictured as a sponge: wetlands, snowpack and forests soak up floods, store water and release it slowly. Each encroached wetland or vanished snowfield removes part of that sponge, so the same shock produces a larger effect. This lens lets the analysis ask whether cumulative change is pushing Kashmir towards a threshold.

Political ecology. Political ecology holds that environmental degradation is shaped by power, policy and economic incentives, not population numbers alone (Robbins, 2012). It directs attention to who benefits from conversion of wetlands, paddy and forest, and why documented problems persist despite existing plans.

Together, DPSIR supplies the structure, resilience theory the interpretation of thresholds, and political ecology the explanation of governance failure.

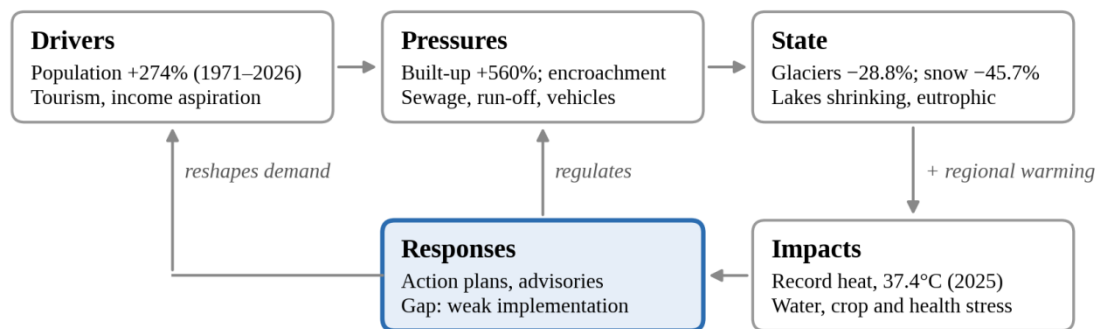


Figure 1: DPSIR framework applied to the Kashmir Valley: local pressures compound regional warming, while responses feed back only weakly

Literature Review

The literature falls into four strands.

Climate and cryosphere. Long records show warming faster than the global mean. Three-station analysis (Srinagar, Leh, Shimla) found a 1.6°C rise over the last century in the north-west Himalaya, with maxima rising faster than minima (Khushu, as cited in Bakloo & Asma, 2019). Romshoo reports a 1.2°C rise over the past century in Kashmir against under 1°C in the plains, and projects about 3°C more by 2100 (Zargar, 2024). Satellite analysis shows Kashmir Himalayan glacier area falling from 101.73 km² in 1980 to 72.41 km² in 2018 (Romshoo et al., 2020). The state plan records snowfall at Fakir Gujri falling from about 3 m to 0.6 m over four decades (GoJK, 2013).

Land use and urbanisation. Remote-sensing studies compiled in the 2026 synthesis report built-up area rising 560% between 1972 and 2020, and a 510% rise in construction around wetlands between 1965 and 2018 (*Multi-System Environmental and Socio-Economic Transformation*, 2026). Dense forest fell from 15.2% to 14.29% of area between 1990 and 2018. Urban population share rose from 24.81% in 2001 to 27.21% in 2011 (GoJK, 2013).

Water bodies and pollution. The state plan identifies encroachment, untreated sewage, hotel and houseboat effluent, fertiliser run-off and siltation as the main threats to lakes (GoJK, 2013). Srinagar produced about 394 tonnes of municipal waste per day in 2010. A government audit cited in the synthesis found that nearly 74% of the region's water bodies had shrunk or dried since 1967 (*Multi-System Environmental*, 2026).

Livelihoods and vulnerability. A common-framework assessment ranked Jammu and Kashmir the most climate-vulnerable of 12 Himalayan states, with Bandipora scoring highest (0.49-0.62) in the Kashmir division (Bakloo & Asma, 2019). Field testimony from women workers describes failing kitchen gardens, dehydration and higher heating costs (Self Employed Women's Association [SEWA], 2024).

Gap. Most studies isolate one sector or one indicator. Few read state policy, peer-reviewed science and community testimony against a single analytical frame. This paper fills that gap through structured document analysis.

Methodology: Document-Based Content Analysis

The study uses document analysis, a systematic procedure for reviewing and interpreting printed and electronic material (Bowen, 2009), combined with content analysis (Krippendorff, 2018). No primary fieldwork was conducted. Seven documents were selected purposively to cover four evidence types: policy, scientific, academic commentary and community or expert testimony.

Table 1: Documents analysed

Document	Type	Year	Role in analysis
<i>State Action Plan on Climate Change: Jammu & Kashmir (GoJK)</i>	Government policy	2013	Baseline pressures, official diagnosis, responses
<i>Multi-System Environmental and Socio-Economic Transformation in Kashmir</i>	Evidence synthesis (unpublished)	2026	Long-run indicators, remote-sensing data
Romshoo et al., glacier recession study	Peer-reviewed article	2020	Cryosphere state
Bakloo & Asma, <i>Enviro Annotations</i>	Academic commentary	2019	Climate trends, vulnerability, governance critique
SEWA field report	NGO grey literature	2024	Community impacts
Scroll interview with S. A. Romshoo	Expert journalism	2024	Hydrology, agriculture, projections
BBC and Deccan Herald heatwave reports	News reporting	2025	Recent extremes, urban heat

Each document was read in full and coded deductively against the five DPSIR categories, then inductively for recurring themes (encroachment, sewage, heat, water scarcity, crop shift). Quantitative statements were extracted with their source year and baseline. The analytical baseline is 1971, the earliest census year in the corpus; it also matches the earliest built-up and wetland series (1972). A 1990s baseline is not viable because no census was conducted in Jammu and Kashmir in 1991. Where a series begins later, such as glaciers (1980) or snow cover (1990), the actual years are retained rather than rescaled. Findings were triangulated: a claim was treated as robust when at least two independent document types agreed.

Results and Findings

The coded evidence shows that every DPSIR category has shifted markedly since 1971, and that human pressures and climate change reinforce each other. The key quantitative signals are summarised in Table 2.

Table 2: Key indicators of change reported in the documents

Indicator	Reported change	Period	Source
Population (J&K)	4.62 million to about 17.3 million (+274%)	1971-2026 (projected)	<i>Multi-System Environmental</i> (2026)
Urban share of population	24.81% to 27.21%	2001-2011	GoJK (2013)
Built-up area	+560%	1972-2020	<i>Multi-System Environmental</i> (2026)
Tourism arrivals	+1,500%; 7.85 crore visitors in 2023-25	1975-2025	<i>Multi-System Environmental</i> (2026)
Dense forest cover	15.2% to 14.29% of area	1990-2018	<i>Multi-System Environmental</i> (2026)
Major wetlands (>25 ha)	288.96 to 266.45 km ² (-7.8%)	1972-2013	<i>Multi-System Environmental</i> (2026)
Glacier area	101.73 to 72.41 km ² (-28.8%)	1980-2018	Romshoo et al. (2020)
Snow-cover area	about 7,000 to 3,800 km ² (-45.7%)	1990-2022	<i>Multi-System Environmental</i> (2026)
Peak summer temperature, Srinagar	about 31°C to 37.4°C	1970s-2025	<i>Multi-System Environmental</i> (2026); Majid (2025)

Drivers and pressures (RQ1)

Demographic growth is the most consistent driver across documents. The state plan names unplanned population growth as a central reason for poor development outcomes and notes that small and medium towns are spreading because of it (GoJK, 2013). Growth has been absorbed horizontally: the built-up surface expanded more than six-fold, much of it on floodplains, wetland margins and paddy land.

Tourism acts as a seasonal multiplier. The state plan states that tourist inflows beyond local carrying capacity have strained resources and infrastructure, raising pollution and sanitation burdens (GoJK, 2013). SEWA (2024) observes that, as farming declines, youth move into taxis, hotels and homestays, raising vehicle numbers and water consumption.

Economic incentives drive land conversion. Romshoo notes that the horticulture area has grown by about 4,000% since 1952 because orchards return four to five times more than paddy (Zargar, 2024). Bakloo and Asma (2019) warn that this shift threatens rice self-sufficiency.

State of the environment (RQ1)

The cryosphere shows the clearest decline: nearly 29% of glacier area lost in under four decades (Romshoo et al., 2020), with about 18 m of average annual recession (Zargar, 2024). Lakes are degraded through encroachment for housing and paddy, sewage and fertiliser run-off. Anchar Lake, once a supplier of reeds and lotus stems, is now largely a residential colony and swamp

(GoJK, 2013). Forest loss appears modest in area but conceals fragmentation and conversion to orchards.

Impacts (RQ2)

Three impact clusters recur. First, **heat**: Srinagar's 37.4°C in July 2025 was its hottest July day in seven decades (Majid, 2025), and BBC reporting links the loss of farmland and forest to concrete with reduced natural cooling and rising air-conditioner demand (BBC News, 2025). Second, **water**: springs and streams are drying, and girls in mountain areas walk long distances for water, harming school attendance (Bakloo & Asma, 2019). Third, **livelihoods and health**: drier autumns depress saffron output (Zargar, 2024), and women report dehydration, heat illness and roughly 40% higher heating costs (SEWA, 2024).

Discussion

The findings support the proposition that Kashmir is moving from a resilient mountain socio-ecological system towards a fragmented and stressed one. In resilience terms (Holling, 1973), the Valley's buffers are thinning on several fronts at once. Glaciers and snowpack, which store winter precipitation for summer, are shrinking; wetlands, which absorb floods and recharge groundwater, are being filled; and green cover that cooled the basin is being sealed under concrete. Each loss weakens the system's ability to absorb the next shock.

Synergy, not separate problems. The documents reveal feedback loops. Warmer winters reduce snow, which reduces summer flow; lower flow concentrates sewage in shrinking lakes; urban heat raises cooling demand and emissions; and scarce irrigation pushes farmers from paddy to orchards. The BBC and Deccan Herald reports place the 2025 heatwave inside this loop, combining reduced moisture and altered wind patterns with local land-surface change (BBC News, 2025; Majid, 2025).

A governance gap. Political ecology helps explain why documented threats persist. The state plan diagnosed encroachment, sewage and tourism overload more than a decade ago and proposed Dal Lake restoration and sewage treatment (GoJK, 2013), yet the same problems dominate the 2024-2025 sources. Romshoo argues that water shortages in a region with very high per-capita availability reflect poor governance rather than resource limits, and that action plans lack sector and panchayat-level detail (Zargar, 2024). Bakloo and Asma (2019) likewise criticise reliance on advisories, such as asking farmers not to grow paddy, in place of community engagement.

The future. The documents converge on a worsening trajectory without intervention. The state plan projects annual temperatures 1.7-2.2°C above the 1970s by 2030 and vegetation-type shifts across many forested grids (GoJK, 2013). Romshoo expects water problems to arrive sooner than 2050 as warming roughly doubles (Zargar, 2024). The 2026 synthesis models three pathways to 2075: business as usual (+3.5-4.5°C, 50-70% wetland loss), moderate intervention (+2.5-3.5°C) and ecological restoration (+2.0-3.0°C, partial recovery) (*Multi-System Environmental*, 2026). Kashmir did little to cause global warming, but local choices on land, water and tourism will decide how hard it lands.

Responses. Proposals across the documents fall into three tiers: regulatory (carrying-capacity limits for tourism, wetland protection, sewage treatment), institutional (village-level climate plans; a Climate Change Mitigation Bank proposed by Bakloo & Asma, 2019) and community-led (composting and tree-planting by SEWA members; SEWA, 2024).

Limitations

First, the study relies entirely on secondary documents, so its findings inherit their gaps and biases. Second, although 1971 anchors the analysis, some series begin later (glaciers 1980, snow cover and forest 1990, urban share 2001), so not every indicator spans the full period. Evidence for 1971-1990 is especially thin, and the missing 1991 census leaves a twenty-year gap in official population data (1981-2001). Third, several headline figures, including population, tourism and built-up growth, come from a 2026 synthesis rather than original datasets, and some cover the former state of Jammu and Kashmir rather than the Valley alone. Fourth, the synthesis also reports index-based growth in vehicles and electricity whose baselines could not be verified; these were deliberately excluded. Fifth, NGO and journalistic sources, such as the reported 30% crop decline (SEWA, 2024), are testimonial and not statistically representative. Finally, the full BBC article could not be accessed directly, so only its widely reported content was used.

Further Scope and Conclusion

Further scope

Future research should build a harmonised 1971-2026 indicator set from census, Landsat and IMD records for the Valley alone. Priorities include quantifying Srinagar's urban heat island, long-term spring and groundwater monitoring, tourism carrying-capacity studies for Gulmarg, Pahalgam and Sonamarg, and epidemiological work linking heat and winter air pollution to health outcomes. Primary fieldwork with farmers, women and municipal officials would test the governance explanations advanced here.

Conclusion

The documentary record answers the three research questions consistently. Development, demographic growth, urban sprawl and tourism have profoundly eroded Kashmir's ecological integrity since 1971, chiefly through encroachment on wetlands and farmland, untreated waste and land-use conversion. These pressures amplify regional warming, producing glacier and snow loss, record heat, water stress and livelihood strain. The documents project further decline unless planning is bound to ecological carrying capacity. Kashmir's problem is less a shortage of knowledge than a shortage of implementation.

References

- Bakloo, F. A., & Asma. (2019, August 7-13). Climate change and Kashmir Valley. *Enviro Annotations*, 37(37), 2.
- BBC News. (2025, July). *Kashmir's growing heat crisis hits health and harvests*. <https://www.bbc.com/news/articles/ckgdpnl34ro>

- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27-40. <https://doi.org/10.3316/QRJ0902027>
- Government of Jammu & Kashmir. (2013). *State action plan on climate change: Jammu & Kashmir*. Department of Environment & Remote Sensing.
- Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4, 1-23. <https://doi.org/10.1146/annurev.es.04.110173.000245>
- Krippendorff, K. (2018). *Content analysis: An introduction to its methodology* (4th ed.). SAGE.
- Majid, Z. (2025, July 5). Srinagar sizzles at 37.4°C, records hottest July temperature since 1953. *Deccan Herald*. <https://www.deccanherald.com/india/jammu-and-kashmir/srinagar-sizzles-at-374c-records-hottest-july-temperature-since-1953-3617353>
- Multi-system environmental and socio-economic transformation in Kashmir (1970s-2025)* [Unpublished manuscript]. (2026).
- Robbins, P. (2012). *Political ecology: A critical introduction* (2nd ed.). Wiley-Blackwell.
- Romshoo, S. A., Fayaz, M., Meraj, G., & Bahuguna, I. M. (2020). Satellite-observed glacier recession in the Kashmir Himalaya, India, from 1980 to 2018. *Environmental Monitoring and Assessment*, 192(9), Article 597. <https://doi.org/10.1007/s10661-020-08554-1>
- Self Employed Women's Association. (2024, August 25). *Climate crisis in paradise: SEWA member's response to Kashmir's environmental challenges* [Blog post]. <https://www.sewa.org/blog/climate-crisis-in-paradise-sewa-members-response-to-kashmirs-environmental-challenges/>
- Smeets, E., & Weterings, R. (1999). *Environmental indicators: Typology and overview* (Technical Report No. 25). European Environment Agency.
- Zargar, S. (2024, March 3). Interview: Kashmir not responsible for climate change, but bears its full brunt, says scientist. *Scroll.in*. <https://scroll.in/article/1063717/interview-kashmir-not-responsible-for-climate-change-but-bears-its-full-brunt-says-scientist>