

Floodplain Erosion and Displacement in Uttar Pradesh: The Need for Institutional Response and Policy Intervention

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Abstract: Floodplain erosion is one of the most persistent and under-recognized environmental challenges in India, especially in the northern states where major Himalayan rivers descend into the plains. In Uttar Pradesh, rivers such as the Ganga, Ghaghara, Sharda, and Rapti experience intense seasonal flows, leading to severe erosion of floodplains and riverbanks. Each year, significant tracts of fertile land are lost and thousands of households are displaced, leading to socio-economic distress and long-term livelihood insecurity. This paper investigates the scale and patterns of floodplain-erosion-induced displacement in Uttar Pradesh using secondary data, government reports, and field observations. It highlights critical gaps in existing institutional mechanisms, including early warning systems, relocation and resettlement policies, and interdepartmental coordination. Floodplains and riverbank erosion play a major role in socio-environmental changes. Findings of a social survey carried out on floodplain-erosion-hit displaced people between the afflux bunds of Sharda Barrage in Lakhimpur Kheri District are discussed in this paper. The study argues for a comprehensive institutional response combining proactive risk assessment, community-based adaptation, sustainable land management, and robust rehabilitation and compensation policies. The paper concludes with policy recommendations to improve governance, enhance resilience, and minimize displacement resulting from floodplain erosion in Uttar Pradesh.

Keywords: Floodplain erosion; Displacement; Uttar Pradesh; Institutional response; Policy intervention; Disaster risk reduction; Floodplain management; Rehabilitation and resettlement; Sustainable land management.

1. Introduction

Floodplains are dynamic geomorphic entities shaped by sediment transport and periodic inundation. While they provide fertile soils and biodiversity, they are also vulnerable to erosion and flooding, especially in monsoon-dominated regions. In India, about 40 million

hectares are flood-prone, and Uttar Pradesh (UP) alone accounts for a significant portion of this risk. The Ganga, Ghaghara, Sharda, Rapti, and their tributaries transport vast sediment loads from the Himalayas, creating a highly active floodplain system.

Floodplain erosion differs from general flood damage: it involves permanent loss of land, shifting of river courses, and forced displacement of populations. Despite its chronic nature, it remains under-addressed in policy frameworks that focus mainly on flood relief rather than erosion mitigation. This paper aims to bridge that gap by examining the scale, socio-economic implications, and institutional responses to floodplain erosion in UP.

Objectives of the Study:

- Assess the extent and patterns of floodplain erosion in UP.
- Examine the socio-economic impacts on displaced communities.
- Evaluate existing institutional and policy mechanisms.
- Recommend strategies for proactive risk reduction, rehabilitation, and sustainable land management.

2. Study Area

The focus area is the middle reach of the Sharda River near Lakhimpur Kheri District, especially between the afflux bunds of the Sharda Barrage. This stretch is emblematic of larger patterns across UP:

- Sharda River System: Originating from the Himalayas (Mahakali in Nepal), it carries a heavy sediment load.



Figure 1: Sharda River and Barrage

- **Afflux Bund Zone:** Narrow river corridors between embankments cause higher flow velocities, bank undercutting, and severe erosion during high floods.
- **Socio-economic Context:** Agriculture is the primary livelihood. Villages are densely populated, with low adaptive capacity and limited access to alternative employment.

3. Methodology

This paper uses a mixed-methods approach:

1. **Secondary Data:** District Flood Management Plans, Central Water Commission (CWC) records, Remote Sensing (RS) and GIS data from Bhuvan and Google Earth Engine to track channel shifts (1990–2023).

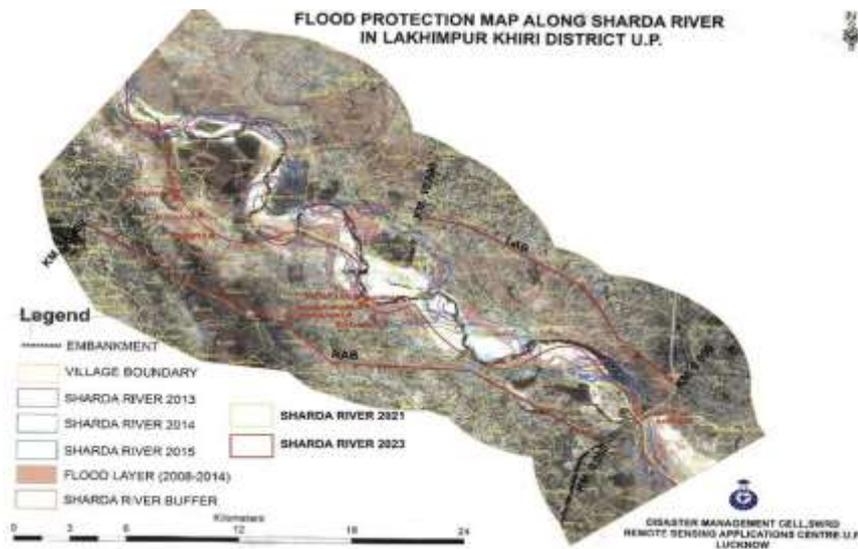


Figure 2: Index Map of Flood Plain Zone

2. Government Reports: State Irrigation Department, NDMA, UP Disaster Management Authority, and Census records.
3. Field Observation: Transects across eroding banks and displaced sites (2023 monsoon).
4. Social Survey: Structured questionnaires among 150 households displaced between 2018–2023 in the Sharda afflux bund zone. Data included land loss, income changes, housing, and perceptions of government response.

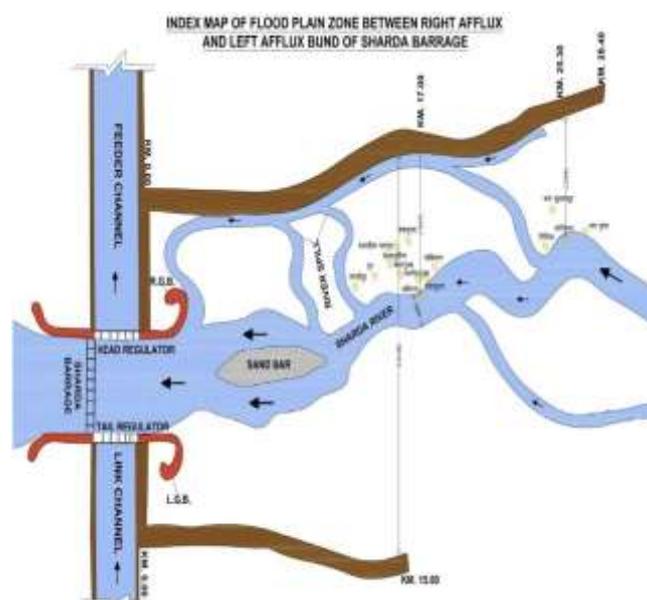


Figure 3: Index map

4. Results

4.1 Patterns of Floodplain Erosion

- **Spatial Shifts:** Satellite analysis shows the Sharda shifted eastwards by 320 m on average between 2000 and 2023.
- **Annual Land Loss:** Average of 120 ha/year lost in the studied stretch.
- **Hotspots:** Confluences, meander bends, and narrow embankment zones exhibited the highest erosion rates.

4.2 Displacement Profile

- **Population Affected:** Approximately 12,000 people displaced cumulatively over 20 years in the focus area.
- **Livelihood Impacts:** 78% of surveyed households lost agricultural land; 56% shifted to wage labor.
- **Housing and Infrastructure:** Schools, health centers, and roads within 2 km of banks damaged repeatedly.

4.3 Institutional Response Assessment

Mechanism	Observed Status	Gaps
Early Warning	SMS-based alerts limited to flood stage, not erosion forecasts	No erosion-specific monitoring
Relief & Compensation	Provided under general flood damage norms	Delays and low coverage; no land-loss compensation
Resettlement Policy	Fragmented; no dedicated erosion displacement policy	Families left in temporary shelters
Interdepartmental Coordination	Multiple agencies (Irrigation, Revenue, Disaster Management) work in silos	Lack of unified platform

5. Discussion

5.1 Floodplain Erosion as a Chronic Disaster

Unlike episodic floods, erosion represents a creeping disaster eroding not only land but also social capital. Yet it remains outside mainstream disaster risk reduction (DRR) frameworks.

5.2 Socio-economic Vulnerability

Population Detail between Sharda River and right afflux Bund of Sharda Barrage

Sno.	Village Name	Population as of 1971	Population as of 2011	Sno.	Village Name	Population as of 1971	Population as of 2011
1	Goom	273	917	14	Sisaura	2062	5030
2	Narahar	1508	3112	15	Jamhaura	0	531
3	Gaura	1860	4413	16	Gujara	563	1793
4	Pipragoom	1228	2342	17	Aasharhi	892	2781
5	Shrinagar	2921	8052	18	Sindhiya	84	353
6	Manpur Karadhahiya	595	1098	19	Jodhpur	782	2286
7	Jungle no.10	273	1495	20	Mainha	77	0
8	Jungle no.11	1497	4231	21	Landipur	260	500
9	Jungle no.9	0	316	22	Grant no.12	639	2201
10	Rura Sultanpur	671	1976	23	Bharakunda	297	115
11	Karsaur	819	2648	24	Sarwa Shivpuri	0	288
12	Bada Gaunv	1241	11971	25	Basaha	964	5270
13	Mehndi	466	1725	Total		19972	65444

25 villages established between Sharda River and right afflux Bund of Sharda Barrage, total population in 1971 is 19972 which has increased to 65444.

In upstream of Sharda Barrage km 0.00 to km 5.50 upto village Jamuniya is submerged area of Sharda Barrage which rehabilitation compensation has been given at construction time but km 5.5 to km 28.4 upto village Nayapurva between both afflux bund, that area is flood plane zone. In that area no rehabilitation compensation has been provided by the government.

Village Mainha has been completely destroyed by the erosion due to flow of Sharda River and many villages are adversely effected by the erosion caused by Sharda river.

Landless and marginal farmers are disproportionately affected. Gendered impacts (loss of women's land titles, disruption of girls' education) were observed in surveys.

5.3 Policy and Institutional Gaps

As per Section 6(3) of Gazette of India Part II – Section 3 – Subsection (ii) , no. 2458, 7 October 2016, New Delhi – *No person shall construct any structure whether permanent or temporary for residential or commercial or industrial or any other purpose in the river Ganga, bank of river Ganga or its tributaries or active flood plain zone area of river Ganga or its tributaries.*

But there is not any policy or Government order regarding who established in before publication of above Gazette. The villagers who established from 1971 at the time of construction of afflux Bund and who has not received any rehabilitation compensation despite facing several challenges in their basic lifestyle activities.

Current relief focuses on short-term measures flood shelters, ex gratia payments but lacks proactive erosion zoning, land banking, or permanent relocation planning. Existing embankments, while reducing flood spread, may exacerbate flow velocity and bank scouring.

6. Recommendations

1. Erosion Zonation Mapping: Integrate erosion risk layers into UP's Disaster Management GIS platform.
2. Early Warning for Erosion: Develop predictive models combining hydrology and sediment transport to anticipate bank failures.
3. Dedicated Policy on Erosion-Induced Displacement: Analogous to NDMA's earthquake or cyclone guidelines.
4. Land Banking & Planned Relocation: Identify secure sites in advance with basic infrastructure to resettle displaced families.
5. Community-Based Adaptation: Empower local disaster management committees, integrate indigenous knowledge (e.g., bio-engineering measures, vegetative stabilization).

6. Cross-Sector Coordination: Create a Floodplain Erosion Task Force linking Irrigation, Revenue, Disaster Management, and Rural Development departments.
7. Sustainable Land Management: Encourage agroforestry, controlled grazing, and riparian buffers to stabilize banks.
8. Livelihood Restoration: Skill training, microfinance, and insurance schemes for displaced farmers.
9. Policy making by Government institution in favour of villager who were established before construction of Irrigation Structures like barrage, dam, etc and did not receive any rehabilitation compensation.

7. Conclusion

Floodplain erosion in Uttar Pradesh is not just an environmental issue but a socio-economic and governance challenge. Displacement erodes livelihoods, intensifies poverty, and undermines development gains. Our findings from the Sharda River stretch highlight the urgent need for comprehensive institutional responses that go beyond relief to proactive risk reduction, planned relocation, and sustainable land management. Only through integrated policies, robust data, and community participation can the state reduce the human cost of erosion and build resilience in vulnerable riverine communities.

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