

WHEN THE MOUNTAINS BREAK, THE PLAINS MUST BE READY

A Cautionary Call for a Disaster-Resilient Punjab

Protect Fragile Ecosystems • Keep Natural Waterways Free • Prepare Communities Before Disaster Strikes

The devastating floods, cloudbursts, landslides and debris flows repeatedly witnessed across the Himalayan region carry an important warning for Punjab.

A disaster originating in the mountains does not necessarily remain confined to the mountains.

Punjab lies immediately downstream of a young, geologically active and ecologically fragile Himalayan system. Extreme rainfall, cloudbursts, landslides, glacial and snowmelt events, earthquakes and slope failures can generate sudden surges of water, sediment, boulders, uprooted trees and debris. Once such flows enter river valleys and reach the foothills, their consequences can travel rapidly into the adjoining plains.

***The lesson for Punjab is therefore clear*:**

«We cannot prevent every extreme natural event, but we can prevent natural hazards from becoming unnecessarily devastating human disasters.»

1. ***Understanding the Chain of Cascading Disaster***

Major disasters increasingly need to be viewed not as isolated events but as cascading and compounding events.

A possible sequence can be:

Extreme Rainfall / Cloudburst / Landslide / Earthquake / Rapid Snow or Ice Melt



Sudden Water and Debris Surge



Temporary Blockages or Failure of Natural Choke Points



Abrupt Release of Impounded Water and Debris



Damage to Dams, Bridges, Roads, Embankments and River Training Works



Obstruction or Diversion of River and Drainage Channels



Flooding of Foothills and Immediate Plains



Failure of Urban and Rural Drainage Networks



Damage to Settlements, Agriculture, Industry and Infrastructure

One failure can therefore trigger another.

This is the cascading multiplier effect of disaster that Punjab must prepare for.

2. *The Himalayan Ecosystem Is Fragile*

The Himalayas are young mountains with steep slopes, unstable geology and highly dynamic river systems.

Heavy construction, indiscriminate hill cutting, destabilisation of slopes, poorly planned roads, excessive excavation, obstruction of drainage paths and loss of vegetation can magnify vulnerability.

Climate variability and increasingly intense rainfall episodes add another dimension of uncertainty.

Development in such terrain must therefore be based upon carrying capacity, slope stability, watershed behaviour and cumulative ecological impact, rather than individual projects being considered in isolation.

Infrastructure development and industrial progression are necessary—but they must be meaningfully eco-sensitive and disaster-resilient.

3. *Punjab Cannot Consider Itself Geographically Insulated*

Punjab's rivers are part of a larger Himalayan river system.

Water does not recognise administrative boundaries.

An extreme upstream event may ultimately affect:

- river flows and embankments;
- foothill settlements;
- floodplains;
- canals and drains;
- bridges and culverts;
- agricultural land;
- industries and urban settlements;
- drinking-water infrastructure;
- electricity and communication networks.

Our rivers, seasonal streams, choes, canals, wetlands and natural drains must consequently be regarded as part of Punjab's disaster-management infrastructure.

Destroying their carrying capacity today may increase tomorrow's flood losses.

4. *Ten Ecological Commandments for a Safer Punjab*

I. *Stop Encroachment on Natural Drains*

Existing drains, choes and historic watercourses must be scientifically mapped, demarcated and protected.

There should be no further encroachment, narrowing or construction that compromises their hydraulic capacity.

II. *Keep Rivers, Canals and Drains Obstruction-Free*

Desilting, vegetation management and removal of genuine obstructions should be undertaken scientifically and before the monsoon.

Bridges and culverts require particular attention because accumulated garbage, vegetation and debris can reduce their effective openings during floods.

III. *Stop Using Water Bodies as Garbage Dumps*

Plastic, municipal waste, construction debris and industrial waste dumped into drains eventually become flood hazards as well as pollution hazards.

Strict enforcement and community surveillance are essential.

IV. *Protect Floodplains*

Floodplains are not wastelands awaiting construction.

They are the natural breathing and expansion spaces of rivers.

Floodplain zoning should identify areas of differing flood risk, with the highest-risk zones protected from new permanent construction except essential, flood-compatible infrastructure.

V. *Restore Floodplain Ecology*

Where ecologically appropriate, floodplains should support native forests, grasses, shrubs, wetlands and riparian vegetation.

Such landscapes can help slow runoff, stabilise soil, retain sediment, support biodiversity and provide space for floodwaters.

VI. *Respect Old River Courses*

Palaeochannels and abandoned or seasonal river courses should be scientifically mapped.

Heavy construction over vulnerable historic flow paths should be avoided or subjected to rigorous hydrological and geotechnical assessment.

A river may abandon a course for decades and still attempt to reclaim it during an exceptional flood.

VII. *Create Safe Diversion and Relief Channels Where Scientifically Justified*

Potential flood-relief channels, spill channels and drainage interconnections should be identified through basin-level hydraulic studies.

These must not be improvised during a disaster; diversion of floodwater can transfer risk to another community and therefore requires advance engineering, environmental assessment and operating protocols.

VIII. *Protect Wetlands and Natural Depressions*

Wetlands, ponds and natural depressions can provide valuable temporary water-storage capacity.

Their filling and conversion should be strictly controlled.

IX. *Audit Critical Infrastructure*

Bridges, culverts, embankments, canals, pumping stations, power installations, STPs, CETPs, water-treatment plants, hospitals and communication facilities in vulnerable areas should undergo pre-monsoon resilience audits.

X. *Development Must Pass the Disaster Test*

Before major infrastructure is approved, one fundamental question should be asked:

«What happens to this project—and to the communities downstream of it—during an extreme rainfall or flood event?»

5. *PROPOSED SOP — BEFORE THE MONSOON*

Every district should have a District Flood & Cascading Disaster Preparedness SOP, extending down to municipal ward and village levels.

A. Risk Mapping

Before every monsoon:

1. Identify vulnerable river reaches.
2. Map floodplains and natural drainage corridors.
3. Identify choke points at bridges and culverts.
4. Inspect embankments and known weak points.
5. Identify low-lying habitations.
6. Map hospitals, schools, industries and critical infrastructure in flood-prone areas.
7. Identify safe evacuation routes and relief centres.
8. Pre-identify locations where machinery may be required.

The maps must be operational documents—not files lying in offices.

6. *SOP — EARLY WARNING*

There should be an integrated information chain:

Upstream Warning → State Control Room → District → Sub-Division → Block → Village/Ward → Individual Citizen

Warnings should incorporate, wherever available:

- extreme rainfall forecasts;
- upstream river levels;
- reservoir releases;
- landslide or debris-flow information;
- embankment conditions;
- downstream water-level projections.

Every warning must clearly state:

What may happen — Where — Approximately when — Who is at risk — What action must immediately be taken.

7. *SOP — VILLAGE AND WARD DISASTER RESPONSE TEAMS*

Every vulnerable village and urban ward should have a small trained response group consisting, as appropriate, of local administration, police, fire services, health personnel, civil defence, volunteers, NGOs and responsible community representatives.

They should know beforehand:

- vulnerable households;
- evacuation routes;
- assembly points;
- shelters;
- emergency contacts;
- locations of elderly persons and persons requiring evacuation assistance;
- availability of tractors, boats and suitable local equipment;

- drinking-water arrangements;
- medical facilities.

The first few minutes and hours of a disaster are often local. Therefore, the first layer of preparedness must also be local.

8. *SOP — SECTOR EMERGENCY STORES*

Strategically located Sector Disaster Stores should be maintained for vulnerable clusters.

Depending upon assessed local risks, these may include rescue equipment, ropes, life jackets, emergency lighting, generators, pumps, communication equipment, first-aid material, water-purification supplies, temporary shelter material and essential tools.

An inventory is useless unless it is:

Available + Serviceable + Accessible + Accounted for + Transportable at short notice.

Periodic physical verification and mobilisation exercises should therefore be mandatory.

9. *SOP — WHEN AN EXTREME UPSTREAM EVENT IS REPORTED*

Immediately:

1. Activate State and affected District Emergency Operations Centres.
2. Establish direct communication with upstream authorities and dam/reservoir operators.
3. Intensify river and drain-level monitoring.
4. Deploy teams to predetermined vulnerable points.
5. Clear removable obstructions at critical drainage structures where this can be done safely.
6. Move rescue resources closer to likely impact areas.
7. Warn downstream villages and urban wards.
8. Restrict public access to dangerous bridges, embankments and riverbanks.

9. Evacuate identified high-risk areas where competent authorities determine evacuation is necessary.

10. Keep hospitals, fire services, police, SDRF/NDRF liaison and essential utilities on heightened readiness.

Do not wait for visible flooding downstream before activating preparedness.

10. *SOP — RESOURCE MOBILISATION*

Punjab should maintain predetermined arrangements for rapid reinforcement from neighbouring districts, neighbouring states and the Central pool.

Requirements should be worked out before, rather than during, a disaster.

A mobilisation matrix should specify:

Requirement → Quantity → Location → Holding Agency → Transport → Responsible Officer → Backup Source.

The same principle should apply to manpower, machinery, medical resources, communications, shelter and logistics.

11. *MULTIPLE-CONTINGENCY PLANNING*

Planning merely for "a flood" is no longer sufficient.

Authorities should rehearse scenarios such as:

Flood + Embankment Breach

Flood + Bridge Failure

Flood + Urban Drainage Collapse

Flood + Electricity Failure

Flood + Drinking-Water Contamination

Flood + Industrial/Chemical Release

Flood + Communication Breakdown

Flood + Multiple Districts Simultaneously Affected

This is the essence of cascading-disaster preparedness.

12. *FINANCIAL READINESS IS ALSO DISASTER READINESS*

Emergency finance should not begin after destruction.

There should be predetermined mechanisms for:

- immediate district contingency expenditure;
- emergency procurement;
- hiring of machinery and transport;
- relief and temporary accommodation;
- restoration of drinking water and sanitation;
- emergency repairs;
- compensation assessment;
- transparent accounting and subsequent audit.

Administrative delay during a disaster can itself become a disaster multiplier.

13. *MOCK DRILLS — PREPARE BEFORE PANIC*

Preparedness cannot exist only on paper.

Pre-monsoon exercises should test:

Warning → Communication → Mobilisation → Evacuation → Rescue → Relief → Medical Response
→ Restoration.

Schools, hospitals, industries, villages, municipal wards and critical utilities in vulnerable areas should participate according to their respective risks.

Failures discovered during an exercise are valuable lessons.

Failures discovered during an actual catastrophe cost lives.

14. *COMMUNITY PREPAREDNESS — MENTALLY AND PHYSICALLY READY, WITHOUT FEAR*

The objective is not to create psychological fear or a sense of permanent threat.

Preparedness should create confidence.

People should understand their local environment, recognise official warnings, know evacuation routes, keep basic emergency necessities accessible and assist vulnerable neighbours.

The message should therefore be:

«Be aware—not afraid.

Be prepared—not panicked.

Be organised—not helpless.»

A prepared community responds rationally. An unprepared community may lose precious time to confusion and rumours.

15. *FROM DISASTER RESPONSE TO DISASTER RESILIENCE*

Punjab needs to move beyond the traditional approach of responding after flooding occurs.

The new doctrine should be:

Anticipate → Prevent → Prepare → Warn → Mobilise → Protect → Respond → Recover → Learn → Improve

Every major flood should produce a documented After-Action Review.

What failed?

Which drain became a bottleneck?

Which bridge opening was inadequate?

Where did communication fail?

Which village received warning too late?

Which embankment was vulnerable?

What equipment was unavailable?

The answers must become corrective actions before the next monsoon.

A CAUTION FOR PUNJAB

The Himalayas are signalling the consequences of increasingly severe and cascading natural events.

Punjab cannot control earthquakes, cloudbursts, extreme rainfall or every landslide.

But Punjab can control encroachments.

Punjab can protect floodplains.

Punjab can keep rivers and drains free of garbage and avoidable obstructions.

Punjab can protect wetlands and natural drainage corridors.

Punjab can insist upon environmentally responsible infrastructure.

Punjab can establish faster warning systems.

Punjab can train communities.

Punjab can position resources beforehand.

And Punjab can prepare for the unexpected rather than merely reacting after devastation.

The Time to Prepare Is Before the Water Arrives

Environmental protection and disaster management are no longer separate subjects.

A protected river is disaster infrastructure.

A functioning drain is disaster infrastructure.

A preserved wetland is disaster infrastructure.

A healthy floodplain is disaster infrastructure.

A resilient forest is disaster infrastructure.

An informed and trained community is disaster infrastructure.

The cost of ecological protection and preparedness may appear substantial today.

The cost of ecological neglect followed by catastrophic reconstruction will be far greater tomorrow.

Let the tragedies witnessed elsewhere not merely become disturbing images that we watch and forget.

Let them become warnings from which Punjab learns, prepares and acts.

**Protect the Fragile Ecosystems*.*

Respect the Natural Flow of Water. Keep Floodplains Alive. Prepare Every District, Village and Ward. Remain Alert—But Never Afraid.*

**Preparedness is not pessimism. Preparedness is responsibility*.*

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