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FROM CUSTOM TO CODE: INTEGRATING INDIAN KNOWLEDGE SYSTEMS INTO DISASTER GOVERNANCE LAW THROUGH COMMUNITY ACTION AND PUBLIC–PRIVATE PARTNERSHIPS

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ABSTRACT

Since the enactment of the Disaster Management Act (2005), India has established a robust institutional framework for Disaster Risk Reduction (DRR). However, a significant divergence persists between formal disaster governance and Indian Knowledge Systems (IKS), which include indigenous practices rooted in communal heritage, ecological stewardship, and social cohesion. This research analyses the systemic disconnect between localized risk-mitigation behaviours and the statutory requirements of disaster law, conceptualizing this transition as the shift "from custom to code." Integrating perspectives from legal studies, public administration, and disaster sociology, the paper argues that while IKS offers an effective informal governance mechanism, its absence from legal codification hinders administrative capacity. Specifically, the lack of transparency and formal recognition complicates the synergy between local expertise and private-sector intervention. Utilizing the recent Punjab floods as a case study, the research illustrates how civil society and religious institutions mobilized indigenous networks outside formal policy frameworks. The study further explores the potential of Public–Private Partnerships (PPPs) to move beyond ad hoc relief toward structured, anticipatory DRR. It concludes by proposing legal and administrative pathways for embedding IKS into decentralized planning and municipal regulations, asserting that such integration is a governance necessity for building resilient, context-responsive disaster frameworks.

Keywords: *Indian Knowledge Systems, Disaster Risk Reduction, Disaster Governance, Public Administration, Legal Pluralism, Public–Private Partnerships.*

Introduction

Disasters in the Indian subcontinent have evolved from episodic events into chronic governance challenges, exacerbated by climate variability, unplanned urbanization, and systemic environmental degradation. To mitigate these threats, India has constructed a comprehensive disaster management architecture characterized by hierarchical institutions and standardized administrative protocols. Nevertheless, contemporary disaster governance remains predominantly reactive and centralized, often failing to account for the socio-ecological realities of vulnerable populations.

Historically, Indian Knowledge Systems (IKS) provided a foundational framework for disaster resilience through ecosystem-based settlement patterns, traditional water management, and adaptive agricultural cycles. These systems operated as informal DRR mechanisms, underpinned by longitudinal observation and collective social responsibility rather than state-mandated enforcement. Despite their proven resilience, modern legislative frameworks seldom recognize these indigenous methodologies as legitimate epistemic sources for policy formulation.

This paper contends that the primary impediment to effective disaster governance in India is not a deficit of indigenous knowledge, but rather a lack of formal legal and administrative mechanisms to translate these customs into actionable governance codes. This "translation

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gap"—the divide between custom and code—attenuates the efficacy of disaster risk reduction strategies and marginalizes community-led participation in formal state processes.

Indian Knowledge Systems as Customary Disaster Governance

Indian Knowledge Systems (IKS) function as decentralized normative frameworks, regulating community behaviour through shared social capital and informal accountability mechanisms. Historically, environmental risk mitigation was embedded in daily praxis, encompassing indigenous land-use zoning, traditional hydraulic engineering (such as community-maintained canal systems), and vernacular architectural adaptations.

Unlike the rigidity of statutory law, IKS is characterized by adaptive governance, allowing for real-time adjustments based on longitudinal ecological observations. This inherent flexibility facilitates rapid community mobilization during crisis events, often bypassing the bureaucratic latencies of formal state channels. However, the predominantly oral and experiential nature of these practices leads to their marginalization within modern administrative systems. In current governance discourse, these systems are frequently dismissed as anecdotal rather than being recognized as Empirical Traditional Knowledge (ETK)[1].

Transitioning the perception of IKS from "cultural heritage" to "living law" is essential for its integration into disaster governance. This shift allows public administration to treat indigenous knowledge as a substantive component of the regulatory ecosystem rather than a peripheral or elective consideration.

Methodology

This research employs a qualitative, interdisciplinary design focused on analytical generalization.

- Legal Pluralism Lens: Analysing the coexistence of customary norms and statutory mandates.
- Comparative Case Study: Utilizing the Punjab floods (informal/rural) and Chandigarh (formal/urban) to demonstrate the custom-code disconnect.
- Data Triangulation: Synthesis of the DM Act (2005), National Policy on Disaster Management (2009), and longitudinal reports on indigenous water management.

Codified Disaster Governance and Legal Limitations

India's contemporary disaster governance is anchored in the Disaster Management Act (2005), which institutionalized a tri-level hierarchical structure (National, State, and District). While the Act marks a paradigm shift toward preparedness, its operational implementation remains heavily technocratic and response-centric.

A critical lacuna in this legal framework is the absence of explicit recognition for customary practices and community-based governance mechanisms. Consequently, public administrators are confined to a narrow mandate that prioritizes standardized planning tools over localized expertise. This creates a systemic paradox: while policy rhetoric emphasizes "community participation," the legal architecture provides no formal mechanism for its integration. Furthermore, the decentralization envisioned under the 73rd and 74th Constitutional

[1] **Empirical Traditional Knowledge (ETK)** is a term sometimes used interchangeably with **Traditional Ecological Knowledge (TEK)** to refer to the accumulated knowledge, practices, and beliefs of indigenous and local communities that have developed over generations through direct observation and interaction with their local environment.

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Amendments remains underutilized in the context of Disaster Risk Reduction (DRR). The lack of statutory pathways forces administrators to rely on *ad hoc*, informal arrangements during emergencies. Such reliance not only undermines institutional accountability but also prevents the development of sustainable, long-term resilience strategies.

Case Analysis: Punjab vs. Chandigarh

Case Study: The Punjab Floods and the Efficacy of Informal Networks

The recent hydrological extremes in Punjab serve as a critical site for analysing the divergence between state-led disaster response and community-based resilience. During the floods, the limitations of the formal administrative machinery were countered by a massive mobilization of socio-religious institutions (such as *Sewa* within Gurudwaras) and local civil society.

These actors utilized indigenous knowledge of the terrain and drainage patterns—often ignored in modern land-use planning—to coordinate rescue and relief operations. This mobilization was not merely philanthropic; it was a manifestation of Legal Pluralism, where customary obligations functioned as a parallel governance system. The community's ability to deploy "sandbagging" techniques and community kitchens (*Langars*) demonstrated a high degree of social capital and informal logistics management.

However, because these efforts operated outside the formal ambit of the 2005 Disaster Management Act, they lacked institutional integration, leading to occasional duplication of efforts and resource gaps. The Punjab case underscores that while indigenous systems provide rapid, context-specific relief, their exclusion from formal State Disaster Management Plans (SDMPs) prevents them from being scaled or systematically supported by state infrastructure.

Chandigarh: The Urban Codification Challenge and the Opportunity for Reform

As a Union Territory and a landmark of modernist urbanism, Chandigarh represents a unique paradox in disaster governance. Characterized by high administrative capacity and a robust legal-regulatory framework, the city is often cited as a model of efficiency. However, this efficiency is rooted in a technocratic planning paradigm that inherently marginalizes informal knowledge and traditional ecological wisdom. The city's rigid adherence to its original Master Plan—while preserving architectural heritage—has created an "institutional lock-in" that struggles to adapt to non-linear climate risks such as escalating heat stress and localized urban flooding.

The "Modernist vs. Vernacular" Conflict: Chandigarh's vulnerability is exacerbated by its high percentage of impervious surfaces and a drainage system designed for mid-20th-century precipitation patterns. Modernist planning often overlooks traditional hydraulic intelligence, such as the use of seasonal swales or indigenous aquifer recharge techniques that were common in the pre-urban landscape of the Punjab plains. By categorizing such practices as "informal" or "substandard," the current Municipal Bye-laws prevent the adoption of cost-effective, nature-based solutions.

Pilot for Administrative "Re-indigenization": Despite these constraints, Chandigarh serves as an ideal pilot site for legal and administrative re-indigenization. Because it possesses a centralized governance structure, the integration of IKS into the Master Plan 2031 can be executed with higher precision than in more fragmented metropolitan areas. This would involve:

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Codifying Vernacular Design: Amending building bye-laws to incentivize "cool-roof" technologies and ventilation patterns derived from traditional North Indian architecture.

Decentralized Blue-Green Infrastructure: Integrating community-led water stewardship—borrowed from the *Panchayat* systems seen in the surrounding Punjab region—into the city's urban sectors.

From Efficiency to Resilience: The opportunity for reform lies in shifting the administrative goal from mechanical efficiency to socio-ecological resilience. Lessons from the community-led responses in neighbouring rural Punjab provide a template for Chandigarh: the mobilization of social networks and local ecological memory can supplement the city's formal disaster response during infrastructure failures. Translating these "informal" strengths into the Chandigarh Disaster Management Plan would transform the city from a static architectural monument into a dynamic, adaptive urban ecosystem.

The following table synthesizes the divergence between informal community-led resilience and codified urban administration.

Table 1: Comparative Analysis of Disaster Governance: Punjab vs. Chandigarh

Governance Variable	Punjab (Rural/Informal Context)	Chandigarh (Urban/Codified Context)
Primary Knowledge Base	IKS & Social Memory: Rooted in historical flood cycles and traditional land-use.	Technocratic Expertise: Driven by modern engineering and standardized Master Plans.
Regulatory Framework	Customary Norms: Regulated by social capital and community-led mutual aid.	Statutory Codes: Regulated by Municipal Bye-laws and the DM Act (2005).
Response Mechanism	Ad Hoc & Rapid: High mobilization speed via religious and social networks (e.g., *Sewa*).	Structured & Hierarchical: Reliant on official departmental coordination and protocol.
Resilience Type	Socio-Ecological: Flexible, decentralized, and ecosystem-dependent.	Infrastructural: Rigid, centralized, and asset-dependent.
Key Limitation	Institutional Invisibility: Lack of formal recognition hinders scaling and state support.	Rigidity: Administrative "lock-in" prevents integration of adaptive indigenous practices.
Integration Potential	Codification of community action into State DM Plans.	"Re-indigenization" of Building Codes and Urban Heat Action Plans.

Public–Private Partnerships (PPP) and the Custom–Code Gap

Historically, Public-Private Partnerships (PPPs) in India have been restricted to large-scale infrastructure and post-disaster relief (World Bank, 2018). In the current governance model, private sector engagement is largely relegated to Corporate Social Responsibility (CSR)—a reactive, post-event mechanism. This paper argues for a paradigm shift toward Integrated, Community-Informed PPPs, where private entities leverage technological and logistical expertise to operationalize Indian Knowledge Systems (IKS).

Beyond "Paper" Policies: The Implementation Lacuna

The Sendai Framework and the Prime Minister's 10-point Agenda explicitly mandate a proactive approach to Disaster Risk Reduction (DRR).[1] The PM's Agenda, for instance, emphasizes building on local capacity (Point 8) and leveraging technology (Point 5). However, a systemic "deliverable gap" persists. Despite initiatives like the *Aapda Mitra* scheme—which has trained over 100,000 community volunteers—the system remains far from reaching transformative outcomes.

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The gap arises because these initiatives often lack a statutory anchor that binds private innovation to traditional wisdom. Without a legal mandate, private sector contributions remain "add-ons" rather than core components of the disaster management cycle.

The Tripartite Model: Technology meets Tradition

To bridge this gap, PPPs must transition from "reactive charity" to "anticipatory DRR." In this model, the synergy between stakeholders is functional rather than philanthropic:

- The Private Sector as a Technical Catalyst: Companies can assist in digitizing Traditional Ecological Knowledge (TEK) through GIS mapping or engineering modern variants of indigenous flood-resistant housing.
- Community as the Epistemic Lead: Local knowledge ensures that private sector interventions are contextually appropriate, culturally sensitive, and ecologically sustainable.
- The State as the Regulatory Bridge: Public administrators act as "knowledge brokers," translating these hybrid solutions into municipal regulations and building codes.

Practical Implications: A Roadmap for Stakeholders

Table 2- Practical implications summary

Stakeholder	Shift from Reactive to Proactive	Deliverable Outcome
Private Sector	From post-disaster CSR donations to pre-disaster R&D in resilient infrastructure.	Scalable, indigenous-inspired disaster resilient technologies.
Public Admin	From top-down "Command and Control" to "Facilitative Governance."	Institutionalized recognition of community-led early warning signs in official alerts.
Local Community	From "Beneficiaries" of relief to "Co-designers" of risk mitigation.	Reduced mortality and economic loss through culturally-embedded preparedness.

Conclusion

Disaster risk reduction in India cannot be strengthened through institutional expansion alone. The continued exclusion of Indian Knowledge Systems from disaster governance law reflects a deeper epistemic imbalance that undermines resilience. While the legal framework (DM Act 2005) provides the "Skeleton," IKS and Community-Informed PPPs provide the "Muscle" required for effective action. The study concludes that bridging the gap between Custom and Code is not merely a cultural exercise; it is a governance necessity. It is the only pathway to move the Sendai Framework from "paper" to the "pavement," ensuring that India's disaster governance is as resilient as the communities it seeks to protect.

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