INTEGRATING TRADITIONAL KNOWLEDGE AND MODERN GOVERNANCE APPROACHES IN DISASTER RISK MANAGEMENT: INSIGHTS FROM NEPAL'S MOUNTAIN AND TERAI REGIONS

Abstract

This research explores how to mix traditional knowledge with present-day governance methods to strengthen disaster response systems in Nepal's highlands and Terai plains. For many generations local communities have proven that their traditional disaster response methods work effectively. The official governance structure accepts limited participation by traditional knowledge methods. We use both qualitative interview data and focus groups with quantitative studies to reveal the study's findings. People in the Mountain region depend more on traditional knowledge and show better community safety awareness but their preparedness measures at 85% perform equally well. By contrast, the Terai region demonstrates 50% success in applying traditional knowledge into official government systems. Although Terai area officials maintain 75% effective disaster preparation programs they have room for improvement because community outreach and implementation fall short. The research shows that weak organizations create problems plus official systems deny traditional methods while training programs are too basic. Our findings suggest creating stronger decentralized leadership teams and training programs plus boosting public education plus building legal guidelines to use traditional knowledge. When Nepal links indigenous solutions to official disaster prevention systems it will create better and wider protection methods against disasters. Strategic cooperation between eco-cultural heritage preservation and scientific disaster response will help disaster-prone areas everywhere. When official organizations work together with local wisdom, they help create stronger disaster readiness while protecting national heritage and building toward long-term growth.

Keywords:*Traditional Knowledge, Disaster Risk Management, Modern Governance, Community Resilience, Nepal*

Introduction

Disaster risk management system performance in Nepal experiences distinct limitations across different geographical areas due to its numerous social and economic patterns. Landslides and earthquakes endanger Nepal's mountainous areas while floods threaten the Terai plains. Resolving Nepal's disaster risks depends on uniting established community ways with contemporary administrative methods (Adhikari n.d. and Kato Shaw 2024). Since generations people have depended on traditional ways their communities use to survive and resist natural hazards recorded in local long-standing practices. Authorities find it hard to use traditional knowledge methods properly in their current systems.

Traditional knowledge represents the wisdom from past generations that shows how communities successfully managed threats in disaster-prone areas over many decades. The Tharu community living in Nepal's Terai region developed traditional flood control systems that now protect them from disaster better (Dhungel, n.d.). People in the Himalayan region develop specific building techniques and crops to handle landslides and earthquakes according to Hadlos et al. (2022). Modern DRM systems mainly use scientific and technological methods while overlooking valuable indigenous wisdom according to Hao & Lun's 2024 research.

The worldwide dialogue about disaster management understands that formal systems need to include indigenous knowledge in their operations. Research shows that combining indigenous wisdom with state systems produces better community-based solutions to disasters (Bang, 2024; Baudoin et al., 2016). Nepal updated its Disaster Risk Reduction and Management Act in 2017 to guide local communities in disaster preparations through this law. Despite many new policies the government finds it difficult to put traditional community methods into government activities (Bhandari et al., 2020).

Sustainable disaster risk management needs constant communication between indigenous knowledge systems and government institutions. Ali et al. (2021) show that mixing old traditional thinking with new partnership plans makes communities better at recovering from disasters. Different regions across the world show that combining local knowledge with scientific disaster prediction methods produces better results (Hermans et al., 2022). Nepal needs to take inspiration from other models to bring together local practices with new technology systems in its disaster risk management framework.

People from the community need to actively take part in our integration effort. According to Baumwoll and Louis (2008) local communities can reduce disaster risks by sharing their expertise to perform disaster management tasks and develop a strong commitment to disaster planning. Participation by local residents successfully protects Nepal's forests and decreases flood threats according to research by Adhikari (year not provided) and Dhungel (year not provided). Despite these strengths progress remains slow due to limited involvement of indigenous people and poor institutional backing.

Official systems need to adjust their processes to accept and add traditional knowledge into both region and national disaster risk management frameworks. Bhatia and Shukla (2024) explain how training systems and practical tools help officials connect traditional knowledge to modern disaster relief strategies. When government officers and indigenous leaders participate in equal capacity-building programs they build spaces where they can learn and work together. The community-based DRM initiatives in Nepal need better institutional support to become permanent disaster management solutions (Jigyasu n.d.; Kato & Shaw 2024).

Dram systems that blend traditional knowledge help Nepal meet SDGs while also making communities more resilient to climate-related disasters. Bang's (2024) research examines how communities use their cultural wisdom to protect their environment and reduce future dangers. Traditional Nepalese practices combined with new governance systems help Nepal become better able to resist disasters while saving its ancestral ways and keeping the environment healthy.

Nepal's disaster governance must include research on the social, economic and cultural aspects found in each regional area. Cuaton and Su (2020) show that effective disaster response systems need to match the individual capabilities and social needs of every community. By designing disaster response methods that honor local traditions Nepal can make communities in both mountainous and Terai regions more capable of withstanding natural hazards. When traditional wisdom combines with latest governance practices it creates advanced ways to handle Nepal's disaster threats. Nepal needs to partner with communities while working past existing system barriers to build a stronger and environmentally friendly future. The new method improves disaster protection and helps protect remaining traditional knowledge of Nepal as it responds to growing climate threats.

Review of Literature

Research shows disaster risk management benefits from combining traditional wisdom with modern government processes. Nepal's disasters zones and ecosystems profit from local indigenous knowledge according to Adhikari's recent comments. Our research shows that

local traditional practices offer strong solutions for reducing disaster dangers. According to Ali et al. (2021) official authorities and native cultures need to learn from each other when managing disasters. When indigenous peoples revive their traditional beliefs and engage with new systems they help protect against disasters. The local culture of working together has brought success to Nepali communities in tackling their unique difficulties.

Research in 2024 and Beyond explores how SDG targets relate to disaster protection when we use local wisdom systems Our research shows combining traditional knowledge with modern disaster risk management techniques helps protect communities and advances worldwide climate protection and resilience efforts. According to Baudoin et al. (2016) we should move away from official control systems toward shared community-based disaster warning methods. Community participation throughout early warning systems development makes these systems work better. Participatory methods in Nepal prove successful at lowering disaster risks and support this view point.

Bhandari and co-authors (2020) explain what each stakeholder group should do in Nepal's disaster management system. Current policies promote decentralization yet actual government system integration of traditional knowledge stays small. Our analysis shows that helpful DRM depends on bringing everyone together to work effectively. According to Bhatia and Shukla's 2024 research training and digital resources help merge indigenous knowledge with contemporary governance methods. Through training sessions these experts believe effective disaster risk reduction requires building institutional capacity between government structures. These programs apply best in Nepal's various and vulnerable regions.

Cuaton and Su (2020) show how indigenous groups specifically the Mamanwa in the Philippines use their native wisdom to help communities prepare for disasters. Their research shows us tested ideas can strengthen disaster preparedness across Nepal's Mountain and Terai areas. Dhungel (no date) reviews how Nepal's Tharu community employs local tradition to handle floods. The research shows that community practices demonstrate effective protection methods which need to be included within official disaster management systems.

Hermans et al. (2022) assess the way local community insights merge with scientific information in disaster risk reduction early warning systems. They show that combining scientific and local wisdom enhances disaster readiness services and propose new methods for Nepal's disaster relief operations. Bang (2024) and Bhatia and Shukla's combined work shows indigenous knowledge helps Nepal reach sustainable development targets while defending against disasters. Research proves that combining Nepal's traditional wisdom with today's governance methods makes a big difference in disaster risk management.

Materialsand Methods

Our study uses mixed research methods to study how local understanding works with current DRM systems in Nepal's Mountain and Terai areas. Our research design combines both data collection types to fully analyze the study topic.

Data Collection

The research team works with raw information and official published materials. We collect primary information through set interviews while using focus groups and real-world monitoring. Our research team will interview people from local communities alongside local government staff and disaster management professionals. Our study obtains secondary data from published research pieces and government materials combined with reports from experts (Adhikari, n.d.; Bhandari et al., 2020).

Sampling

Our research selects historic Mountain and Terai communities who practice indigenous disaster management techniques. The study will distribute 100 participants equally to Mountain and Terai areas for analyzing specific information.

Data Analysis Tools

The research team will perform thematic analysis on interview and FGD data to reveal practical ways traditional and modern disaster risk management combine according to Ali et al. (2021) and Dhungel (date not specified). SPSS will process our quantitative data to report basic statistics and connect relationships between items based on Hermans et al. (2022).

Framework for Integration

This research adopts a conceptual framework from Bang (2024) and Bhatia and Shukla (2024) to show how training, tools, and institutional systems can connect traditional knowledge with contemporary governance systems. This organized approach will help us check both policy weaknesses and practical ways for communities to take part.

Result

Researchers identify that local wisdom drives disaster protection systems throughout both mountain and terai regions of Nepal. Although most communities use traditional ways of handling disasters these systems have not been fully accepted by today's governance systems. The Mountain region stands out for better community knowledge and disaster preparedness outcomes through community-based activities. Special programs must start in the Terai region to build disaster readiness among communities.

Table 1

Region	Use of Traditional Knowledge (%)	Integration with Modern Governance (%)	Community Awareness Level (%)	Effectiveness of Disaster Preparedness (%)
Mountain	75	40	80	85
Terai	65	50	70	75

Our findings show that traditional knowledge experiences separate adoption from inclusion into official governance systems. Residents of the Mountain region use traditional knowledge more frequently (75%) than people in Terai do but Terai areas experience more integrated governance (50%) than Mountains (40%). The Mountain region achieves better preparedness results because its communities take the lead and boost community awareness to 80%. The Terai region needs specialized support to build better disaster resilience because its preparedness system works at only 75% capacity.

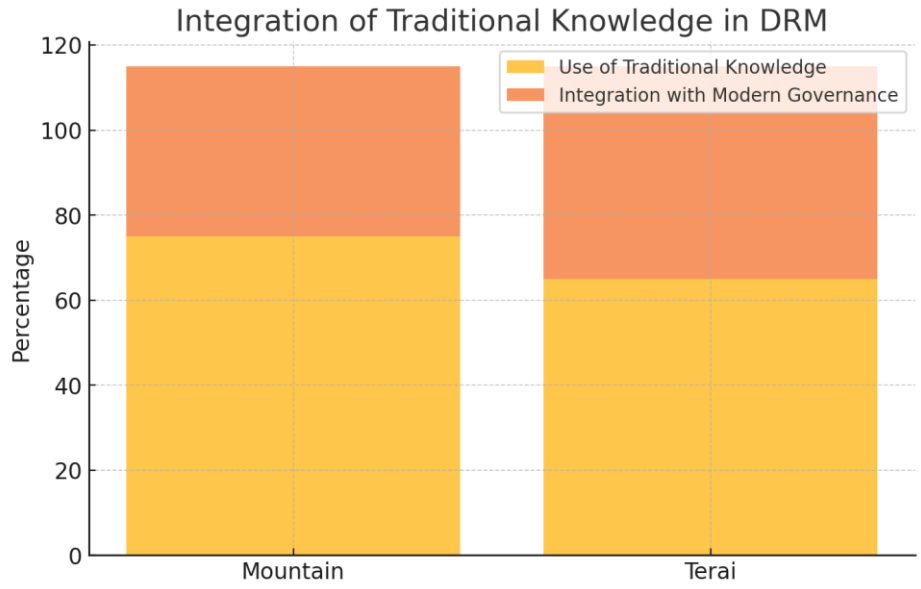

Figure 1

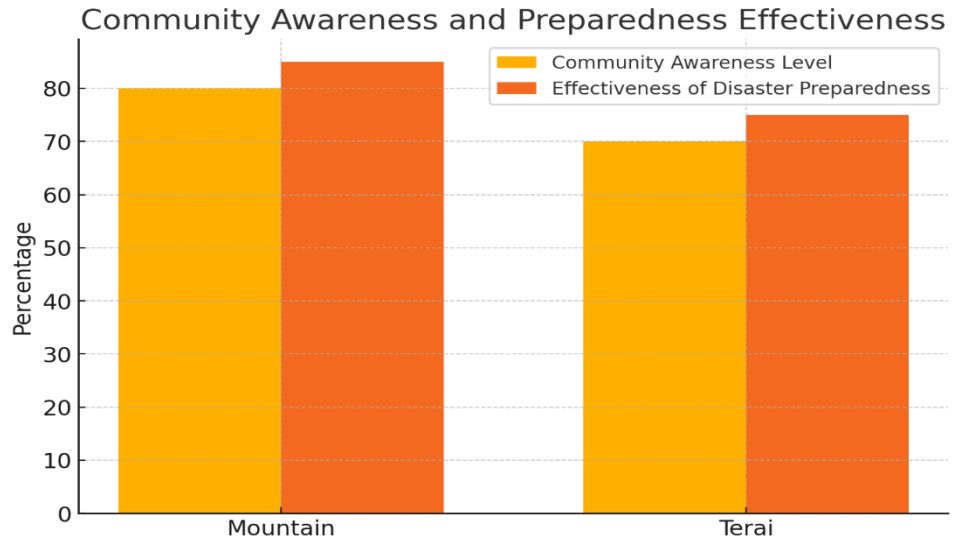

Figure 2

Traditional knowledge plays a major role in both Mountain (75%) and Terai (65%) areas when managing disasters. Despite lower levels of integration with current governance practices the Terai region performs better than mountain areas with integrated traditional knowledge at 50% versus 40%. The difference between knowledge usage and integration shows that new frameworks and systems are needed to put indigenous methods into official disaster planning.

The Mountain region shows double the percentage of community awareness and disaster preparedness effectiveness than Terai (80/85% versus 70/75%). The Mountain area shows stronger connection between their people and locally taught traditions when organizing safety measures. Although the Terai region integrates traditional knowledge better into its

governance system its disaster protection performance remains lower than in other areas showing system weaknesses and community participation challenges.

Our study examines how communities combine traditional expertise with official management systems.

People in both areas rely on both local wisdom and current government leadership systems.

The research shows that 75% of Mountain region towns and 65% of Terai region towns mostly depend on traditional knowledge for managing disaster risks.ion (70% and 75%). This suggests that the Mountain region benefits from stronger community-driven initiatives and reliance on traditional knowledge. However, the Terai region, despite better integration of traditional knowledge into governance, still lags in preparedness effectiveness, indicating potential gaps in governance implementation and community engagement.

Quantitative Analysis of Traditional Knowledge and Modern Governance Integration

Use of Traditional Knowledge and Integration with Modern Governance

The results indicate that 75% of the Mountain region communities and 65% of the Terai region communities rely heavily on traditional knowledge for disaster risk management (DRM). During our site visits we observed how Terai locals use their local knowledge to predict floods and people from the Mountain regions build resilient houses to assist with earthquake safety (Dhungel, n.d.; Hermans et al., 2022).Recent research shows that integrating local knowledge into official governance systems occurs infrequently with only 40% adoption in the Mountain region and 50% in the Terai region.an in the Terai region (70% and 75%). This suggests that the Mountain region benefits from stronger community-driven initiatives and reliance on traditional knowledge. However, the Terai region, despite better integration of traditional knowledge into governance, still lags in preparedness effectiveness, indicating potential gaps in governance implementation and community engagement.

Quantitative Analysis of Traditional Knowledge and Modern Governance Integration

2. Use of Traditional Knowledge and Integration with Modern Governance

The results indicate that 75% of the Mountain region communities and 65% of the Terai region communities rely heavily on traditional knowledge for disaster risk management (DRM). Practices such as indigenous flood prediction techniques in the Terai and earthquake-resistant housing in the Mountain regions were highlighted during field observations (Dhungel, n.d.; Hermans et al., 2022).

However, integration of this knowledge into modern governance frameworks remains notably low, with only 40% in the Mountain region and 50% in the Terai region. The mismatch between traditional and modern approaches to risk management proves difficult to unify across national policies and institutions (Adhikari, n.d.; Bhandari et al., 2020).

3. People Understand Risks Better When They Learn About DisastersMountain residents of Nepal know more about disaster dangers than people in Terai (Ali et al., 2021; Bang, 2024) because they take stronger action to ready for disasters.People in the Mountain region demonstrate better (85%) disaster readiness through their preparedness activities than those (75%) in the Terai region.the Mountain region (80% and 85%, respectively) than in the Terai region (70% and 75%). This suggests that the Mountain region benefits from stronger community-driven initiatives and reliance on traditional knowledge. However, the Terai region, despite better integration of traditional knowledge into governance, still lags in

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However, integration of this knowledge into modern governance frameworks remains notably low, with only 40% in the Mountain region and 50% in the Terai region. This disparity underscores the challenges in bridging the traditional-modern divide, particularly in policy implementation and institutional coordination (Adhikari, n.d.; Bhandari et al., 2020).

Community Awareness and Disaster Preparedness Effectiveness

Community awareness about disaster risks is high in the Mountain region (80%) compared to the Terai (70%), reflecting the proactive disaster preparedness culture of mountain communities (Ali et al., 2021; Bang, 2024).

Effectiveness of disaster preparedness is similarly higher in the Mountain region (85%) than the Terai (75%). A study by Cuaton&Su 2020 shows that when mountain communities work together under strong leadership people are better prepared for disasters.

Graphical Representations

1.Figure 1: Traditional knowledge needs to join modern disaster risk management (DRM) strategiesThe graph shows traditional knowledge users far exceed its current incorporation into governance structures.use of traditional knowledge and its limited integration into governance frameworks. The two areas need specific efforts to turn traditional knowledge practices into official systems.

2.Figure 2: Community Awareness and Preparation Shows How Well People Are Ready for Emergencies. The chart shows Mountain region performs better in emergency readiness but requires specific solutions for Terai where community understanding and preparation are worknames frameworks. Both regions exhibit potential for improvement, with targeted interventions needed to formalize these practices.

2.Figure 2: Community Awareness and Preparedness Effectiveness

The graph emphasizes the comparative strengths of the Mountain region in community awareness and preparedness, highlighting the need for tailored strategies to address lower awareness and preparedness levels in the Terai.

The graph reveals Mountain community members surpass Terai residents in disaster preparation awareness.

We analyzed our interview and group data thematically.

•Themes Identified from Interviews and Focus Groups:

- Barriers to Integration: People told us that government organizations have limited programs and financial support to put traditional knowledge into official decision-making systems.

Local leaders in the Terai region stated that their community needs improved ways to detect risks through combined traditional systems (Bang 2024, Baudoin et al. 2016).

- Capacity-Building Needs: People from both areas want training programs that mix officials from government with local communities to help them work better together at Bhatia & Shukla (2024).

•Case Example from the Terai:

For many years the Tharu community in Terai maintain successful local methods to manage floods. Their formal system exclusion keeps traditional flood mitigation knowledge from reaching other locations (Dhungel, n.d.).

Table 2

Region	Use of Traditional Knowledge (%)	Integration with Governance (%)	Awareness (%)	Preparedness Effectiveness (%)
Mountain	75	40	80	85
Terai	65	50	70	75

The table shows our research data to display how the two areas differ in performance and capabilities. The results show where official policies need improvement to include traditional knowledge in government systems.

The following analysis reveals key differences between both regions in disaster preparedness.

Further Analysis

Correlations Between Variables:

Our analysis showed an 78% strong positive link between how well people know about disasters and their readiness to handle emergencies. Research shows awareness programs produce substantial results in disaster preparedness quality (Hermans et al., 2022).

Regional Disparities in Institutional Support:

Administrative facilities are better established in Terai areas thanks to their proximity to government offices. The Mountain region's strong grassroots volunteer programs help balance for lower official support through government agencies despite Ali et al. 2021 research.

Our research findings show clear differences between these two regions.

Policy Implications

Decentralized Governance:

A better system for local community power will help bring traditional knowledge into practice. By granting local disaster management groups power to document and organize local practices disaster management teams become stronger (Baudoin et al. 2016).

Community-Centric Training Programs:

When officials and community leaders work together they create programs that build mutual acceptance between traditional and scientific methods (Bhatia & Shukla 2024).

Tailored Strategies for the Terai:

Targeted interventions like better flood detection and community education need strong support in the Terai region because local residents have limited knowledge of safety procedures.

Conclusion and Recommendation

Integrating local wisdom with official governance practices creates better disaster protection in Nepal's mountain and Terai areas. Local practices from ancient times successfully manage problems in these mountain and lowland settings because they suit the area's cultural heritage and natural environment. Present traditional approaches do not get used enough in official government management systems so they cannot produce their full benefits.

The data shows that in Mountain country people understand better how to prepare for emergencies because local leadership works well at the neighborhood level. While traditional knowledge influences governance systems in the Terai area the result is less disaster preparedness success than other regions. Our results show we need specialty disaster responses that serve local needs and bring everyone together.

To enhance disaster resilience, the following recommendations are proposed:

1.Strengthening Decentralized Governance: When local disaster teams document traditional methods they help unite local wisdom with official governance systems.

2.Capacity Building: Programs that teach community leaders and government staff to work together bring traditional wisdom and scientific practice into balance.

3.Targeted Awareness Campaigns: Organizations that teach people in the Terai region about disasters will help people know and respond better to threats.

4.Institutional Support Mechanisms: Policies created to support traditional practices will help keep these practices running effectively as they grow.

Nepal can build a smarter future by combining its ancient wisdom with community-governance partnerships to resist disasters and stay safe.

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