

# Inclusive urban development to reduce biological hazards and disaster risks

A case study of Bharatpur, Nepal



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This brief is based on the research project, *“Integrating Rights and Equality in Land-use Planning for Risk-informed Development Amid COVID-19 in Bharatpur Metropolitan City, Nepal.”* The study was conducted by Youth Innovation Lab, Nepal, for Stockholm Environment Institute (SEI).

IMAGE (ABOVE): © SKANDA GAUTAM /  
YOUTH INNOVATION LAB.

## Key messages

- Inadequate waste management and insufficient water and sanitation services in urban areas increase the often-overlooked risks of biological hazards – those that arise from disease-producing organisms. Moreover, biological hazards interact with other types of hazards, such as flooding, compounding impacts on both human health and sustainable urban development.
- Haphazard urban development together with a lack of cross-sectoral coordination and meaningful community participation leads to disproportional vulnerabilities to biological and other hazards, especially for marginalized communities.
- An assessment of Bharatpur, the third-largest city in Nepal, suggests ways to increase the coherence of urban planning, public services, and disaster risk reduction measures, and, at the same time, integrate the needs of the most vulnerable groups.
- Based on this assessment, the authors recommend five policy changes. 1) Increase policy coherence and institutional coordination across levels and sectors of government. 2) Pay attention to the different impacts hazards have on different groups. 3) Develop capacity and allocate resources to help local government address risks for different groups. 4) Customize policies to address needs, particularly in peri-urban and rural areas engulfed by rapid urban growth. 5) Use community-engagement approaches to include and address issues raised by residents of marginalized communities.

## 1. Introduction

The pandemic experience reinforced the need for planning to focus on biological hazards – those that arise from disease-producing organisms – alongside planning to reduce disaster risks from meteorological, hydrological and geological hazards (Chan et al., 2021). Indeed, as the pandemic vividly demonstrated, biological hazards do not occur in isolation; they interact closely with pre-existing socio-economic and environmental factors. In the pandemic, highly dense and unplanned settlements made social distancing difficult and left many urban dwellers without access to essential services such as water and sanitation, particularly in the Global South.

Social, political and economic marginalization and inadequate government capacity to mitigate, prepare and respond to such hazards are underlying drivers of risk. These issues can determine whether and how a given hazard escalates to become a disaster – and can determine which people are affected (International Federation of

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Red Cross and Red Crescent Societies (IFRC), 2020). For example, certain groups were disproportionately impacted by Covid-19 and other historical pandemics as a result of socioeconomic, ethnic and geographical inequalities (Bambra et al., 2020).

The post-pandemic recovery period provides an opportunity for national and local policymakers to re-evaluate and strengthen existing disaster risk reduction mechanisms to better cope with the complexity of hazards, while tackling underlying drivers of vulnerability. In this effort, cities and towns provide an essential space to examine the complex relationships between biological (and other) hazards, risk, vulnerability and coping capacities; and to devise policy measures that recognize and address such links.

In this brief, we apply the Framework for Integrating Rights and Equality (FIRE), which supports systemic integration of rights and equality into disaster risk reduction mechanisms through six key principles (see Section 3). The framework helps illuminate the links between biological hazards and drivers of vulnerability, and it provides the basis for specific policy-based pathways that we recommend (see Section 4).

## 2. Case study: Bharatpur Metropolitan City

From April to August 2022, SEI and the Youth Innovation Lab conducted a study in Bharatpur, to examine biological hazards, drivers of vulnerability and the implications for improving urban planning, service delivery and disaster risk reduction. As one of the fastest-growing cities in Nepal, Bharatpur offers a useful case study to unpack these links and examine the policy implications.

The study involved a desk review, key informant interviews, focus-group discussions, and a workshop for sharing and validating findings. We conducted 15 interviews with experts from land-use and urban-planning departments, public-health entities, local government, and human-rights organizations. The study's four focus-group discussions involved more than 40 participants from local communities. Participants included residents from wards 2 and 10, which are located in the urban core and have a high concentration of poor, informal settlements; Ward 16, with large riverside settlements; and Ward 29, a recently incorporated area on the rural fringe with a large Chepang Indigenous community. The interviews and focus groups were semi-structured with open-ended questions intended to best capture lived experiences and concerns.

### Biological hazards in Bharatpur

*"We do not have a well-managed and dedicated landfill site. Where we usually dispose of the municipal waste sometimes gets flooded [...] In that case, waste may not get collected for a month." – Resident, Ward 10*

*"We drink water directly from tube well. We face problems of [finding] clean drinking water during rainy season. At the time of flood, we are compelled to drink contaminated water." – Resident, Ward 29*

*"There is a lack of coordination among authorities that deal with electricity, drinking water, road, and drainage systems [...] As a result, the town [...] appears haphazard." – Resident, Ward 2*

Despite large-scale investments in infrastructure and service provision from the city government, people in the communities involved in our studies continue to experience health risks from multiple hazards.

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Waste management is one of the key contributors to biological hazard in Bharatpur. Municipal garbage collection takes place once a week, and sometimes only once a month. This leads to the use of the riversides for landfill, illegal and unsanitary dumping and burning of solid waste in nearby forests, and leakages into the Narayani, one of the two rivers running through the city. Continued construction of open sewage canals provides more breeding grounds for the mosquitoes that spread dengue. Medical-waste disposal, particularly open burning of medical waste by hospitals, was also reported by study participants.

Frequent flooding compounds the risks from such biological hazards. Despite undertaking improved flood prevention measures, the government continues to provide licenses to the construction industry for extraction of materials from the riverbed, which causes soil erosion and flooding near Bharatpur's rivers. A recently constructed dam, which diverts the flow of water, further exacerbates flood risks in the main city area. During the monsoon season, river flooding coupled with unsanitary conditions leads to contamination of waterways. This in turn causes a shortage of safe drinking water and outbreaks of water-borne diseases such as cholera, diarrhoea, dysentery, and typhoid.

These hazards point to the importance of not only proper urban waste management and water and sanitation systems, but also of land-use and urban-planning measures to ensure that urban dwellers are not exposed to such risks. Cross-sectoral coordination and the consideration of biological hazards in city planning and disaster risk reduction are needed.

#### Drivers of vulnerability in Bharatpur

*"We have been deprived of the services because we do not have legal ownership of the land." – Resident, Ward 16*

*"[The] chairperson [of local authority] would listen to our issues and would give us a positive response but that could never be seen in action." – Resident, Ward 10*

The residents of Bharatpur do not experience risk equally. Rather, structural conditions related to power, ideology and inequality drive vulnerability. Indeed, our study shows how the current urban-expansion paradigm increases risks by focusing on rapid growth at the expense of social equity, public services, tenure security and inclusion of the most vulnerable.

- **Haphazard urban development and ill-equipped governance** – Nepal has undergone radical structural transformation with the urban population of the country soaring from 14% in 2014 to 60% in 2017, motivated by internal power struggles and the state's top-down decisions to become an urban country (Ruszczuk, 2020). Bharatpur is Nepal's third-most populous city and one of the country's fastest growing urban areas; its population expanded from 14,000 in 1991 to 280,000 in 2017 (Ruszczuk, 2020). As Bharatpur grew, it absorbed new wards and villages from the urban fringe. Services and infrastructure, however, failed to keep pace, and local administrations that confronted increasing responsibilities did not have adequate resources to govern such new urban spaces (Ruszczuk, 2020). When this rapid growth began, Bharatpur had no formal planning mechanism; it has since adopted an incremental planning approach, with new policies reinforced selectively, mainly in the urban core where the elected government has an established relationship with the communities (Ruszczuk, 2020).

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- **Unequal provisioning of urban services** – Many residents in Bharatpur lack access to basic services such as water and healthcare, which determine communities' abilities to cope with hazards. The communities that struggle to access services are those in informal settlements on the urban periphery, where residents have low income levels. Many of the residents of these communities are members of marginalized and Indigenous groups. For example, while Bharatpur has established subsidized medical services for marginalized communities, these schemes are only available at hospitals in the urban core; thus, they are not accessible to those living in peripheral or rural areas. Furthermore, despite significant investment in drinking-water projects in the past five years, access to water remains unequal. Communities in peripheral and rural areas complained of sporadic availability, unaffordability, and unreliability of water supply from the government-installed taps.
  - **Lack of housing security and property rights in informal settlements** – Nepal is experiencing significant rural-to-urban migration, particularly from remote, upland areas due to decreasing land productivity and employment opportunities and increasing natural hazards (Bhawana, 2017). These migration patterns have led to a rise in informal settlements in cities. In Bharatpur, settlements have been constructed alongside riverbanks, which are prone to frequent flooding and landslides. Moreover, residents of these areas often lack legal ownership of the land. Such tenure insecurity compounds other vulnerabilities and prevents them from accessing services and resources. For instance, respondents discussed a lack of access to mortgages due to their inability to use land as collateral; this situation has cascading impacts on their financial security.
  - **Social discrimination** – Socioeconomic identities shape Bharatpur residents' access to urban services and decision-making and thus overall vulnerabilities. Bharatpur's population is heterogeneous, with a small Indigenous population and large, diverse migrant groups. With social discrimination (based on caste, gender, sexuality, disability and ethnicity, for example) endemic in Nepal, historically marginalized groups have less access to water, sanitation and hygiene (Balasubramanya et al., 2022). During the pandemic, women, Indigenous Peoples, people with disabilities, and those with intersectional identities in Nepal faced worsened inequalities in terms of health, food security, and violence (Gurung, 2021).
  - **Insufficient participation in decision-making and access to information** – Respondents also reported a lack of meaningful community participation in decision-making processes. While local residents raise issues and concerns through local Reform Committees (*Tol Sudhar Samitis*), the study found that their input is rarely taken seriously and that their expressed needs are unaddressed or fail to lead to follow-up action. The pandemic underlined the inability of local authorities to govern beyond the urban core and the effects of pre-existing inequalities on access to vital government information. For example, marginalized communities such as the Chepang Indigenous group lacked knowledge about Covid-19 vaccination options and relief distribution programmes that aimed to support vulnerable populations. Despite policies aiming to meet the needs of people in isolation, respondents nevertheless reported difficulties accessing daily essentials.

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### 3. Integrating human rights and gender equality in urban planning, disaster risk reduction and health

During the pandemic, isolated policy approaches and siloed policy implementation increased vulnerability of certain communities and magnified pre-existing social inequalities. These lessons from Bharatpur underscore the need for policy coherence between urban planning, public health and disaster risk reduction measures. Effective policies for all three areas must consider underlying drivers of vulnerability and the potential to compound risks.

As Bharatpur continues to urbanize, its capacity to address biological hazards is also developing, with new options made possible by federal-level actions. The 2015 earthquake mobilized political consensus to establish a federal system and to decentralize power to local governments (Ruszczuk, 2020). This devolved nature of governance provides a strong institutional grounding for rights-based and locally responsive approaches. Its effectiveness, however, will rely on deliberate efforts to recognize and address underlying causes that make certain groups more vulnerable than others.

#### A framework for a new approach

A recently developed approach called the Framework for Integrating Rights and Equality (FIRE) aims to consolidate international standards and guidelines to provide practical steps to integrate human rights and gender into existing operational approaches (Scott et al., 2022). FIRE can enhance cross-sectoral coordination while grounding relevant policies in the needs of the most marginalized groups.

Figure 1: The FIRE approach highlights the six dimensions that should inform law, policy, and practice related to disaster risk reduction at national and local levels.



Source: Scott et al., 2022.

Using this guiding framework, our research outlines certain policy implications for integrating rights and equality into disaster risk reduction in Bharatpur. The application of the framework to Bharatpur also serves as an example for the wider international disaster risk reduction community of how the approach can be operationalized.

FIRE principles	Policy implications
<b>Fundamental rights and equality</b>	Policies to reduce disaster risks must ensure access, ownership and usage of land and key urban services, particularly for marginalized communities. They must fulfil human rights to shelter, healthcare, water and sanitation. Mechanisms must be put in place to safeguard against planning decisions that may erode these rights. Nuanced analysis is required to recognize forces of marginalization that may hinder the fulfilment of respective rights in differentiated ways, such as according to caste, indigeneity, disability and gender (including non-binary gender).
<b>Non-discrimination</b>	Policies must draw from data that are broken down into categories so that policymakers can examine socioeconomic status and forces of marginalization to ensure that communities' rights are protected without discrimination. Current disaster risk reduction in Bharatpur adopts a blanket approach at the community level, without consideration of differentiated levels of vulnerability. Data that show vulnerable subgroups at the household, ward, and municipal level are needed to assess and adequately respond to differentiated risks.
<b>Social norms and context</b>	Consideration must be given to social and gendered norms that determine who owns the land, who is responsible for domestic needs, and how urban services are used. Urban development and disaster risk reduction measures should recognize how such norms shape who is exposed and vulnerable to different types of risks, and ensure they are mitigated accordingly.
<b>Agency and empowerment</b>	Policies in Bharatpur must recognize the power, agency and rights of its most vulnerable and marginalized communities. The development of Bharatpur's Risk-Sensitive Land Use Plan, for instance, should seek to include the knowledge and lived experience of Indigenous groups and informal settlers to ensure that future land uses do not expose people to further risks.
<b>Governance system and structure</b>	The complex and compounding nature of risks highlights the importance of increasing coordination and collaboration among departments and with local communities. For example, operational access to the recently established Local Emergency Operation Center in Bharatpur must be extended beyond the municipal office, to strengthen links among relevant departments such as health, urban planning, and disaster risk reduction.
<b>Participation and access to information</b>	Mechanisms should be established to foster meaningful community participation in decision-making and access to information. Information should be provided in a timely manner, in local languages and free from jargon. In Bharatpur, issues are raised through the Reform Committee. However, steps must be taken to ensure greater accountability so that voices are heard and acted upon. Moreover, measures should be taken to ensure that excluded groups have access to these spaces. In Bharatpur, the study finds that local women, youth and social reform groups can help to spread awareness within the community and act as a bridge for coordination between the local government and communities. A good starting point would be to address the service-delivery gaps identified by the communities. Other actors, such as those in the private sector, may be incorporated to identify innovative and inclusive solutions to provide safe, affordable and accessible water and sanitation services.



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## 4. Policy recommendations

Building on these policy implications for Bharatpur, we make five overarching recommendations that apply at the national and local levels:

**Increase policy coherence.** Policy coherence and institutional coordination between urban planning, public health, risk governance, and economic development should be strengthened, particularly at the local-government level where policy implementation occurs.

**Address different impacts that hazards have on different groups.** Policymakers must pay attention to the differentiated impact of hazards on different groups. Though the FIRE approach provides a practical tool for operationalizing these concepts into policy, context-specific analysis is needed to understand forces of marginalization and their impacts. Failing to do so might actually further exacerbate the negative effects for some groups, and create even more dominant majorities.

**Boost capacity development and resources for local governments.** In Nepal, both the federal system and the increased autonomy of local authorities present an opportunity for local government to address differentiated risks and vulnerabilities. Capacity development and resource allocation among relevant, local-level departments and sectors will be required to leverage this opportunity to greatest effect; such investments are needed to ensure common understanding of the transformation from risk-blind development to risk-informed development and of integrating rights and equality.

**Customize policies to address areas impacted by urban growth.** In Bharatpur and other fast-growing cities in the Global South, rapid urbanization will likely mean that peri-urban and rural areas will in effect become part of the greater metropolitan area. Accordingly, local authorities need to customize disaster risk reduction, urban land-use planning and development, and public-health measures to address context-specific challenges.

**Bring marginalized communities into decision-making processes.** Community-engagement platforms must ensure meaningful participation that reaches marginalized communities. Participatory approaches should be tailor-made to ensure that voices of diverse groups from the different areas in the city are heard, and that decisions are made giving due consideration to the communities' contributions.

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