Policies for tomorrow's risk-resilient and equitable cities

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Urbanisation and disaster in Nepal

Nepal is one of the world's fastest urbanising countries, a trend projected to continue from 2018 until 2050 (UNDESA, 2018). Migration triggered by different political movements (Dhakal, 2015), the restructuring of the nation after federalism and gerrymandering (Bakrania, 2015; Bhattarai et al., 2023), leading to the designation of predominantly rural areas into municipalities substantially increased the national urban population from 17.1% in 2011 to 66.08% in 2021 (CBS, 2021; Poudel et al., 2021). Meanwhile, symbolising urbanisation as "development" (Shrestha, 2021; MoUD, 2016), the Government of Nepal in 2016 declared 10 smart cities and later identified 40 other growing cities for priority and planned interventions (Timsina et al., 2020).

Urbanisation in Nepal, however, is characterised by haphazard construction activities which has triggered the risks of hazards like inundation, floods and landslides (Poudel et al., 2023b; Bhattarai et al., 2023). However, the integration of risk sensitivity in urban planning and urban service delivery is undermined as political decisions dominate municipal designation. Furthermore, mainstream top-down technocratic urban planning overlooks the aspirations of socio-culturally and economically diverse communities (e.g. marginalised and migrants) within the country.

In this brief, we aim to contribute ways to address these gaps and facilitate the attainment of the

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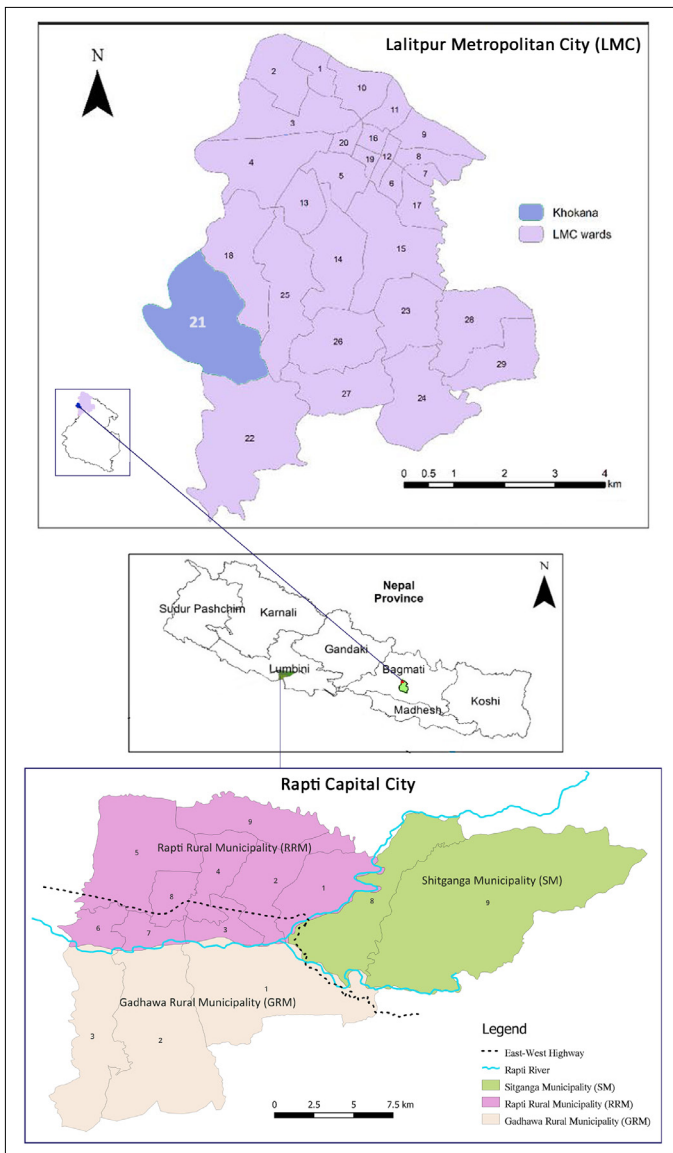✉ dilli@sias-southasia.org

Key policy messages

1. Haphazard urbanisation, construction activities and rapid migration create and trigger hazards such as inundation, landslides, fires, and encroachment in traditional settlements and farming land.

2. (Local) municipal governments urgently need to extrapolate emerging and future risks of hazards considering existing risks triggered by haphazard urbanisation.

3. Since disasters caused by vulnerabilities and hazards affect human society, culture, identity and livelihood practices, the engagement of social scientists to foresee the social aspects of risks from the inception of urban planning is quintessential.

4. Urban planning should not be portrayed solely as an infrastructure development project (e.g. high-rise buildings, wide roads, etc) but also conservation of local culture and environment, and inclusion of traditional knowledge and practices.

5. A deliberative and iterative engagement with disaggregated communities (e.g. caste/ethnicity, migrants, marginalised, informal settlers, women) is crucial to envisioning inclusive and resilient future/tomorrow's cities.

6. All kinds of municipal development endeavours should be informed, embraced and institutionalised accounting for emerging and potential risks reduction and management aspects urgently.

Map 1: Location map of Khokana (top) and Rapti Capital City (down)

exposed to increasing multi-hazard risks, the local governments lack the resources and capacity to handle these "local" risks. Most local risks were not locally created but rather triggered by external activities (central level decisions, migration, neo-liberal real estate) (Poudel et al., *forthcoming*). Despite the devolution of risk management authority to the local governments, the ward governments struggled to design policies to address urbanisation-induced disasters, highlighting a gap between risk management practices and risk governance.

Understanding and addressing multi-hazard risks and precarity (re)produced in the urbanisation process also requires deliberative involvement of the poor, migrants and other marginalised groups, and recognition of local traditions, knowledge about local risk history, disaster trends, and changing contexts in the urban planning and development process. This is only possible by facilitating deliberative engagement of local communities, authorities, experts and other relevant stakeholders with a stake in the city planning process.

In this policy brief, based on a series of workshops, collective futuristic discussions with socio-economically different communities, and visioning processes conducted in Khokana and Rapti/Deukhuri Valley (Poudel et al., 2023a; 2024a; Poudel et al., 2024b), we present *co-produced* findings for future policies to envision equitable and disaster-resilient cities. Given that the national urban development strategy has set

national vision of sustainable, inclusive, resilient, green, and efficient future cities envisioned in the Nepal Urban Development Strategy 2017.

We deployed *co-production* activities (fig. 1) with the communities of Khokana, Kathmandu Valley (July 2019 - March 2023) and Rapti/Deukhuri, Lumbini Province (August 2022 – March 2024), two emerging cities distinct in terms of geography (mid-hills and Inner plain land, respectively), spatial coverage (3.2 and 485 sq. km), population (5,274 and 76,194 in 2021) and development priorities (site for national pride infrastructures development and provincial capital city development). Our longitudinal and collaborative engagements with communities showed that despite these urbanising areas being

Figure 1: Process of co-producing knowledge

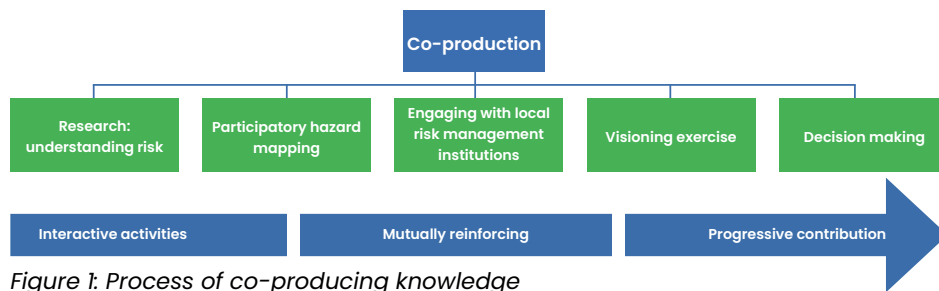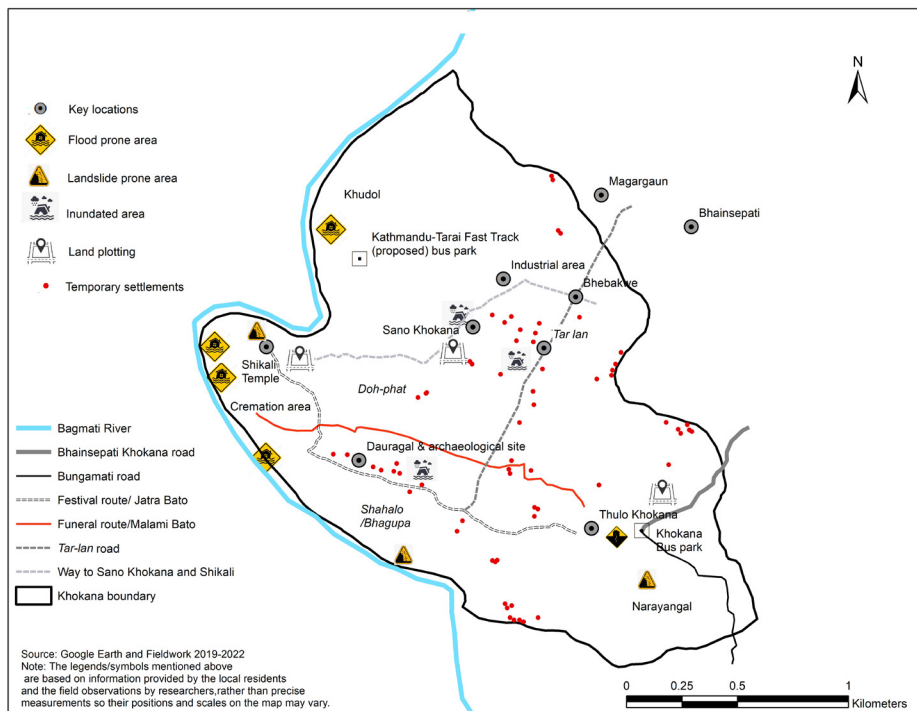"disaster risk management plan and capability in all municipalities" as a major milestone to be accomplished by 2031 (MoUD, 2017), this brief would be valuable for the local authorities of the Kathmandu Valley, Lumbini provincial government and other provincial and sub-national governments of Nepal. It could also be insightful for other stakeholders such as non-governmental organisations, academia, researchers, and city authorities to facilitate urban planning in emerging, secondary and overlooked cities in the context of planetary urbanisation, especially, in the global South.

Urban disasters context of Khokana

Khokana, administratively, Ward no. 21 of Lalitpur Metropolitan City, Kathmandu Valley was nominated as a potential UNESCO World Heritage Site in 1996 for its rich cultural, economic and archaeological significance. This traditionally farming-based Newar ethnic settlement now also hosts heterogeneous (indigenous and migrant) communities engaged in small enterprises, real estate, and multiple state-led large-scale development projects such as the fast-track road and high-tension transmission line. These development projects, together with emerging market opportunities, have attracted migrants seeking affordable land to rent or reside permanently. Its traditional settlements have become denser, while the widespread conversion of open farmland into enclosed built-up areas has accelerated. Our research shows that Khokana is transforming socially and physically, turning into a more hazard-prone conglomeration (Poudel et al., 2023b)

Specifically, Khokana is at risk of flood, inundation (north, west and south-west) and landslides (east and south). The landslides in the south and east of Khokana have destroyed farmlands and threatened the expanding settlements including the Khokana bus park area. Inundation and blockade of earthen roads during monsoon are common in the settlements rapidly expanding into farmlands. Temporary settlements (i.e. *Taharas*) mushrooming in these farmlands interrupt water flows and exacerbate inundation, especially near the canals (called *Rajkulo*) and its tributaries. The western part of Khokana where the famous *Shikali* temple and several crematorium grounds exist is exposed to risks of landslides and riverbank erosion. This religious area is further marred by cracks of approximately 60 meters induced by the 2015 earthquake. The floodplain of Bagmati river where urban infrastructure projects such as Zero Point (i.e. the endpoint of the Fast Track Road) are located, is prone to inundation.

Moreover, the densification (accelerated post-earthquake reconstruction) of traditional settlements with narrow alleys and streets has exacerbated their vulnerability to fire hazards. Also, post-earthquake reconstruction in the core settlements has neglected building codes due to budget constraints and congested spaces for house construction. Amplifying risks, development projects, increasing land speculation, and land encroachment, including of cultural sites, have not only sparked disputes between residents and authorities of the development projects but also affected local culture and the livelihoods of poor, low-caste groups and migrant communities (Timsina et al., 2022; Poudel et al., 2023b).

Map 2 : *Participatory hazard map of Khokana (Poudel et.al., 2024a)*

Photos: *The haphazard construction risking both upper and lower buildings in Khokana (left) and the poor drainage alongside the road leading to inundation of settlements in Rapti (right)*
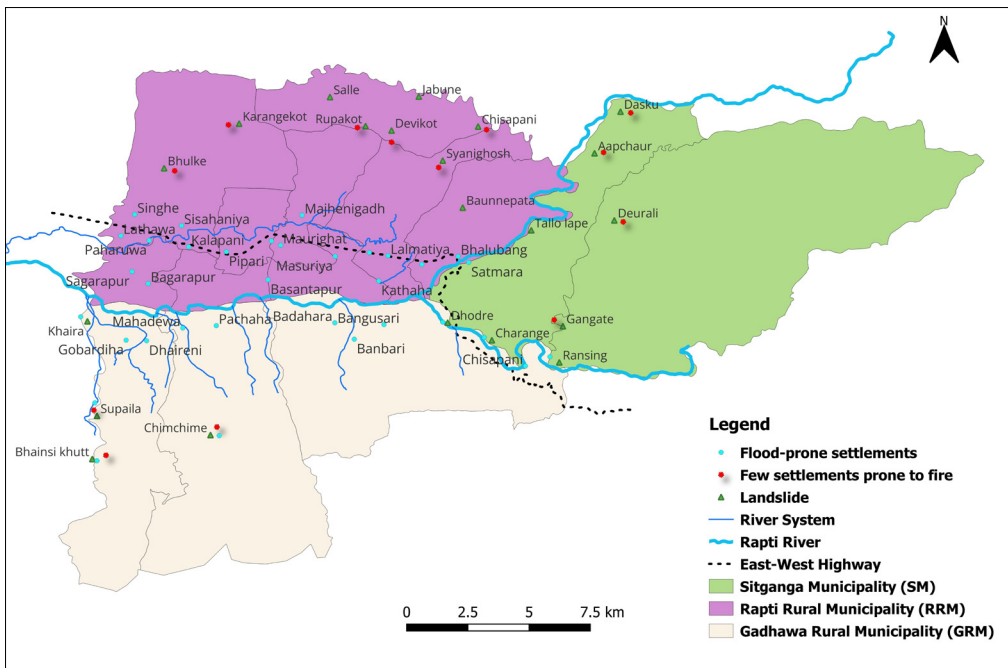
Map 3: Hazard prone settlements of Rapti Capital City (Poudel et. al., 2024b)

Urban disasters context of Rapti

Rapti Valley, the capital city of Lumbini Province, comprises Rapti Rural Municipality (all nine wards) and wards 1, 2, and 3 of Gadhawa Rural Municipality of Dang district, and 8 and 9 of Shitganga Municipality of Arghakhanchi district. With over half of its population owning less than five *dhur* (0.0084 ha) of land and 18 percent being landless, poverty is prevalent in Rapti Valley (Poudel et al., 2024b). Besides widespread poverty, this emerging provincial capital is fraught with disaster risks due to surge of unplanned construction to accommodate the growing population. Recent studies, including the Master Plan of Lumbini Provincial Capital City (LPCC), note that the valley floor of the capital territory is at risk of flooding and inundations whereas the surrounding hills (i.e. Chure and Dunduwa) are at risk of landslides and fire (Poudel et al., 2024b; PIDA, 2022).

Many of its seasonal rivers (tributaries of Rapti River) lack embankments and bridges, while those recently constructed, for example, in the Dolai and Singhe rivers, further constricted the river outlets and exacerbated the inundation issues. This stemmed from the ignorance of authorities to local risk histories, knowledge and community participation, leading to the creation of an "engineered disaster". A similar case of "engineered disaster" repeated in Sisahaniya (Rapti Rural Municipality) where a hospital building was constructed in an inundation-prone area at the bank of Dolai River despite the community's warning. The upgrading of the East-West highway also ignored the need for adequate drainage systems. Subsequently, inundation has become frequent during monsoon as the construction of houses has increased in the areas prone to waterlogging. In the Sohanpur area (Lamahi municipality - 1), the problem of inundation intensified when dams and embankments were constructed without adequate community consultation. As a result, *"Locals had to destroy the dams to channel the flood water to Singhe river during the July 2012 flood"* (a respondent). Moreover, burgeoning urban sprawl, haphazard infrastructure development, and surging extraction of construction materials are likely to intensify flooding, inundation, and landslides and worsen communities' vulnerabilities in the Rapti Valley, in addition to the fear of loss of local traditions and agriculture-based livelihoods.

Community-envisioned urban development and risk management policies

Given the widespread risks spurred by the haphazard urbanisation, the communities of Khokana and Rapti held rigorous discussions, simultaneously envisioning their tomorrow's city as inclusive, prosperous, and risk-resilient. Visioning exercises included (i) consultation with different segments of the cities, including the poor, women, migrants, squatters, ethnic, Tharu and other marginalised groups, and (ii) the analysis of risks through participatory hazard mapping and understanding local risk histories and memories. Communities in both these emerging cities envisioned risk-sensitive infrastructure development while maintaining their culture and identity in tomorrow's cities.

Communities in **Khokana** had varying views regarding the prospects and pitfalls of constructing large-scale development projects. Nonetheless, they unanimously embraced the importance of developing inclusive, risk-

Photo: Engaging with the community of Khokana

resilient, and well-equipped schools, hospitals, roads, and other physical infrastructures. Urban development, they asserted, should, however, not be at the expense of local culture, traditions, and livelihoods. Rather, it should foster culture-based tourism, conserving tangible and intangible cultural heritage, expanding the market for local products, and boosting the local economy.

For this, they envisioned a "New Khokana" on the outskirts of the core settlement while keeping intact the rustics of ancient Khokana in the core. These developments, however, will emphasise the construction of conventional buildings and settlements, en route to culturally significant places like the Shikali temple, archaeological sites and cultural routes. Other initiatives included the construction of cable cars, black-topped roads and bridges to enhance connectivity and tourism, along with the development of risk-sensitive land use plans, conservation of agricultural areas, and management of ancient irrigation canals (*Rajkulo*). Additionally, they located an industrial zone afar core settlements while promoting local handicrafts and skills, including reviving the age-old traditional oil-press mills, a symbol of Khokana's identity, for economic self-sustainability.

The communities envisioned designing a disaster-resilient development plan, delineating risky areas, and adopting risk-sensitive land uses to achieve the goals of their future cities. Other key strategies they envisioned are integrating disaster management in education and vocational training, enhancing human resource capacity, and instituting and strengthening disaster management units with adequate ward funds and relief materials, in collaboration with concerned stakeholders. Given the increasing urban sprawl and deteriorating land-based identity and economy, nonetheless, the communities are optimistic that empowering traditional institutions (*Guthi*) and mobilising development committees comprising experts,

could facilitate socially inclusive, culturally-informed, and economically and environmentally integrative urban development.

In **Rapti** Valley, communities called for the formulation and implementation of policies to manage existing disasters and prevent future risks. Their core priorities include construction of embankments, bridges, and culverts, including in the seasonal rivers originating from the northern and southern hills, channelling surface runoff of the seasonal rivers into Rapti river and diverting their water for other purposes such as irrigation. They specifically highlighted the necessity of river management policies to expedite the construction of embankments (using bio-engineering/bio-fencing methods). Additionally, their other core priorities include identifying and implementing other measures to manage the (seasonal) rivers, including bridges, drainage canals alongside roadways, specifically preventing occupancy of river floodplains and using less agriculturally potent areas for urban expansion. Besides envisioning these resilient infrastructures, they stressed that effective disaster management, with adequate open spaces, will necessitate availing evacuation centres, fire brigades, ambulances, and other services, and support from higher levels of government to enhance local risk management capacities.

Photo: Engaging with the community of Rapti

Next in their priority was the development of a risk-sensitive land use policy aimed to control urban expansion in the landslide and flood-prone and into the agriculturally productive areas, while ensuring the conservation of social and cultural assets. Participants noted the importance of making policy provisions, like building code guidelines, that are affordable to address local concerns and gain social acceptance (e.g. less bureaucratic and expensive). Additionally, they underscored the urgency of identifying and addressing the needs of the poor through policies related to land, social housing, employment, health and free quality education to eliminate

poverty and discrimination, tackle vulnerabilities, and avert risks in tomorrow's city. They believed these measures, together with the Rapti River and Chure (the north hills) area conservation policy, could significantly reduce the risks such as flooding, inundation and forest fires. These could help preserve water sources, expand economic opportunities, and simultaneously prevent future conflicts related to resource use. Nonetheless, they asserted that embracing the policy that balances urban development, risks, local culture and environment to foster social harmony and security cannot be achieved without inclusive planning and deliberate coordination efforts from all three levels of the government.

Discussion – resilient cities

Urbanisation in Khokana and Rapti Valley is accelerating as the government has emphasised infrastructure development projects, attracting migrants. The influx of population and development activities in these emerging cities has triggered haphazard construction, encroachment of forest boundaries, and extraction of resources (e.g. sand, stone). These urbanisation-induced changes have exposed dwellers to multiple risks, including fires, floods, landslides, inundation, erosion, and the potential for social divisions and conflicts. Delineating risk-prone areas and developing infrastructures that could protect these cities from multi-hazard risks and enhance prosperity are the core priorities of the communities. Urban development, as communities envisioned, should simultaneously contribute to the conservation of local culture and environment, including agricultural land, and foster social harmony and inclusion of the poor and marginalised groups. However, the technocratic, top-down planning that ignores local knowledge, values, experiences and views can aggravate the intensity and impacts of the multi-hazard risks, intensifying "engineered disasters", and accelerate doubts, distress, and divisions between planners and community, particularly with haphazard urban expansion in these future cities.

Haphazard urbanisation and ensuing multi-hazard risks and vulnerabilities observed in Khokana and Rapti has also heightened in most urban areas of Nepal (see also KVDA, 2015). The National Policy for Disaster Risk Reduction (DRR) 2018 acknowledges that increasing population, poverty, unplanned urbanisation and lack of risk-informed development activities have increased

disaster vulnerabilities in the country. The 2018 policy emphasises integrating DRR principles into all developmental activities considering inclusivity, equity and local knowledge and incorporating recommendations from local Disaster Risk Management (DRM) plans. However, their pragmatic implementation and impacts are yet to be realised in emerging cities like Khokana and Rapti. The existing local-level risk reduction policies also suffer from poor implementation. For instance, limited budgets and congested spaces for house construction in Khokana impeded compliance with the building code during reconstruction after the 2015 earthquake. In Rapti, administrative hassles in accessing services and low affordability (e.g. high cost incurred in getting blueprint approved) can be attributed to non-compliance with regulatory measures during new construction.

The DRR and Management Act 2017 and Local Government Operation Act 2017 have assigned local governments (i.e. rural municipalities/ municipalities) the roles and responsibilities to develop local disaster management plans, policies and guidelines to create disaster-resilient communities. Local governments, however, severely lack capabilities, and limited local efforts are not adequate for managing disasters, which have multi-scalar causes and multi-sectoral consequences. For instance, the increasing migration and neoliberal markets caused haphazard constructions (roads, houses), triggering inundation and landslides and affecting communities diversely in both Khokana and Rapti. Although urban risks have multifarious roots and repercussions, as observed in Khokana and Rapti, hazards (e.g. earthquakes) and infrastructure-centric (e.g. building code) risk management strategies remain the central focus of the National Disaster Risk Reduction and Management Strategic Plan of Action (2018–2030). Moreover, although disaster policies aim to incentivise "safer development in low-risk areas" and discourage development in high-risk areas (See MoHA, 2018b: 77), they lack detailed disaster risk management and reduction policy guidance to deal with disasters and mainstream risk management in urban planning.

Regardless of these gaps, urbanisation has become a national priority as "the best way to sustainable development" (MoUD, 2016: 3). The National Urban Development Strategy (MoUD, 2017) aims for a balanced and prosperous urban system, promoting social justice and

equity and "enhancing the capacity to cope with" multi-hazard risks. However, consideration of the urbanisation-induced and aggravated socio-cultural risks, dispossession, exclusion and insecurities pervading urbanising societies such as Khokana and Rapti has yet not received adequate attention. The risk-sensitive land use plan (RSLUP) and the 20 years strategic master plan of the Kathmandu Valley Development Authority (KVDA) have prioritised new urban development based on risk-sensitivity (KVDA, 2016), but their implementations are yet to be observed. City-level disaster resilience plans also often neglect the urbanisation-escalated multi-hazard risks and vulnerabilities faced by socio-economically marginalised communities, as in the case of Khokana and Rapti. Similarly, technocratic expertise (e.g. consultancy-based) dominating the urban development plan tends to undermine the knowledge, concerns, values and views of the local residents. Importantly, consideration of urban planning as *only* technical engineering tasks, disregarding socio-economic analyses would fail to accommodate local culture, concerns and ownership of the entire plans. Consequently, infrastructure-centric urbanisation has aggravated disaster risks (e.g. "engineered disasters") not only in Khokana and Rapti but also in many other emerging, secondary and overlooked cities of Nepal. Socio-economic analysis and integration of visions and indicators derived from the deliberative processes would essentially enhance the quality of risk-sensitive plans and create additional ownership among local city dwellers, who should drive the urbanisation process.

Conclusion and Recommendation

Increasing risks like inundations, floods, landslides, fires, erosions and associated socio-economic losses and vulnerabilities in growing cities like Khokana and Rapti are the consequences of complexly interconnected socio-economic, political, and institutional processes. If urbanisation is not managed deliberately considering existing and emerging risks, the flow of people, resources, commodities and knowledge transcend the capacity of local geography, environment and authorities. Our longitudinal engagement in these cities showed that technical urban planning which lacks knowledge of local social practices and systems triggers the risk of hazards and conflict in emerging cities. International practices show that resilient urban planning demands coordinated (i.e. bottom-up,

local-federal) and inclusive (i.e. communities, traditional knowledge and culture), actions from multiple levels, across multiple sectors and involving multi-stakeholders and multidisciplinary scientists. Overcoming the dominant technocratic top-down practice of equating urbanisation as physical infrastructures and equitably integrating the social science perspectives in urban planning can help untangle the complexities. And, subsequently, embracing the multi-disciplinary, inclusive, and integrated approach for effective translation of urban development plans and disaster management policies can facilitate achieving equitable and resilient tomorrow's cities. Hence, to realise future equitable and resilient cities, we suggest the following policy recommendations;

1. Tomorrow's cities should not be restricted to physical development (e.g. construction of high-rise buildings, wide roads), but also reflect local culture (e.g. heritage-based, tourism), livelihood practices (e.g. agriculture-based), conservation of forest and resources (e.g. eco-tourism) and management of disaster risks.

2. Without sufficient resources, capacity and authority, local governments and wards cannot manage future risks, which may or may not be locally created, however, will be experienced locally.

3. Risk management and reduction should include cross-cutting, deliberative and coordinated actions, be they related to the development of physical infrastructures, cultural promotion, social harmony, or environmental conservation.

4. Attention should be given to local views, values, interests, and the risks experienced by different social groups (i.e. differential vulnerabilities) who can provide a comprehensive understanding of how urbanisation is reshaping risks in emerging/tomorrow's cities.

5. Rather than relying on a top-down technocratic process, the development and implementation of urban plans should embrace deliberative processes that address the differential impacts of urbanisation and enhance capabilities at the local level.

6. Future city/urban planning should consider existing agricultural and other traditional practices and their continuation as local livelihoods, culture and traditions are directly related to them. Disregarding them increases poverty and informality, and, subsequently, social disasters in tomorrow's cities.

Acknowledgement

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