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The Spatial Impact of International Reconstruction Aid in the Aftermath of the 2015 Gorkha Earthquake: Gentrification and Lessons

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Abstract

The 2015 Gorkha earthquake in Nepal caused significant property and life loss, triggering a large influx of international reconstruction aid. This paper investigates the spatial implications of this international aid, particularly in Lalitpur. It examines how aid from NGOs and bilateral and multilateral agencies affects urban spaces, including rent, land values, and infrastructure distribution. The study focuses on Wards hosting aid projects and personnel and compares these to earthquake-affected Wards without aid presence as a counterfactual.

Two key points emerge: 1) The clustering of aid organization headquarters (operational presence) creates negative externalities, favoring a rentier class over equitable distribution of housing and infrastructure. 2) Aid-funded reconstruction projects (project presence) shift amenities and businesses, accelerating inequity in ways distinct from operational presence. Two Wards in Lalitpur show notable negative impacts, including rising rents, changes in small businesses, and a shift towards catering to the rentier class due to the effects of aid.

The research provides policy recommendations for local governments and disaster management authorities in Nepal to address these unequal impacts. Recommendations include monitoring and evaluating aid effects over time, collaboration, and the promotion of transparency in urban development and fiscal resilience.

Keywords: Disaster Resilience, Impact Evaluation, Local area management, Urban Planning

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सन् २०१५ को गोरखा भूकम्प पछिको अन्तर्राष्ट्रिय पुनर्निर्माण सहयोगको स्थानिक प्रभाव: स्थान सम्पन्नीकरण र पाठहरू

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पाण्डुलिपी प्राप्त: ३० जुन २०२३ अन्तिम परिमार्जन: ६ सेप्टेम्बर २०२४ स्वीकृत: ५ अगस्ट २०२४

सार

नेपालमा २०१५ को गोरखा भूकम्पले उल्लेखनीय जनधनको क्षति गऱ्यो, जसले अन्तर्राष्ट्रिय पुनर्निर्माण सहायताको ठूलो प्रवाहलाई निम्त्यायो । प्रस्तुत अध्ययनले विशेष गरी ललितपुर नगरपालिकामा यस्तो अन्तर्राष्ट्रिय सहायताको स्थानिक प्रभावहरूको अनुसन्धान गरेको छ । यसमा गैरसरकारी संस्थाहरू र द्विपक्षीय र बहुपक्षीय एजेन्सीहरूबाट प्राप्त सहायताले घरभाडा, जग्गाको मूल्य र पूर्वाधार वितरण लगायत शहरी स्थानिक विशेषताहरूलाई कसरी असर गर्छ भनेर जाँचिएको छ । यस अध्ययनले सहायता परियोजनाहरू र कर्मचारीहरूको उपस्थिति भएका र नभएका भूकम्प प्रभावित वडाहरूको तुलना गरेको छ ।

यस अध्ययनमा दुई मुख्य बुँदाहरू देखा परेका छन्: १) सहायता सङ्गठन मुख्यालयको क्लस्टरिङ (परिचालन उपस्थिति) ले आवास र पूर्वाधारको समान वितरण होइन कि बरु भाडा खाने सम्पन्न वर्गलाई फाइदा हुने किसिमको नकारात्मक बाह्यताहरू (negative externalities) सिर्जना गर्दछ, २) अन्तर्राष्ट्रिय वित्तीय सहायता-पोषित पुनर्निर्माण परियोजनाहरू (परियोजना उपस्थिति) ले सुविधाहरू र व्यवसायहरू स्थानान्तरण गर्दछ र 'परिचालन उपस्थिति' ले भन्दा फरक ढङ्गले असमानताको वृद्धि गर्दछ । ललितपुरका दुई वडाहरूमा घरभाडामा वृद्धि, साना व्यवसायहरूमा परिवर्तन, र सहायताको प्रभावका कारण भाडा खाने सम्पन्न वर्गलाई फाइदा पुग्ने किसिमको उल्लेखनीय नकारात्मक प्रभावहरू देखियो ।

यस अनुसन्धानले यी असमान प्रभावहरूलाई सम्बोधन गर्न नेपालका स्थानीय सरकारहरू र प्रकोप व्यवस्थापन अधिकारीहरूका लागि नीतिगत सिफारिसहरू दिएको छ । सिफारिसहरूमा सहायता प्रभावहरूको लामो समय समेट्ने अनुगमन र मूल्याङ्कन, सहकार्य र शहरी विकास तथा वित्तीय उत्थानशीलतामा पारदर्शिताको प्रवर्धन गर्नुपर्ने विषयहरू समावेश छन् ।

शब्दकुञ्जी: प्रकोप उत्थानशीलता, प्रभाव मूल्याङ्कन, स्थानीय क्षेत्र व्यवस्थापन, शहरी योजना

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1. Introduction

On April 25th, 2015, a 7.8 magnitude earthquake struck Nepal, followed by a 7.3 magnitude aftershock on May 12, 2015. Over 800,000 homes were destroyed, and over 288,000 were damaged in the 14 worst-hit districts (Nepal earthquake recovery monitoring assessment, 2015). A Post Disaster Needs Assessment determined that economic loss due to the earthquake was one-third of the country's GDP. Earthquake impact was felt most acutely in 14 municipalities, and damages included those to housing, infrastructure such as roads and bridges, public buildings and educational structures.

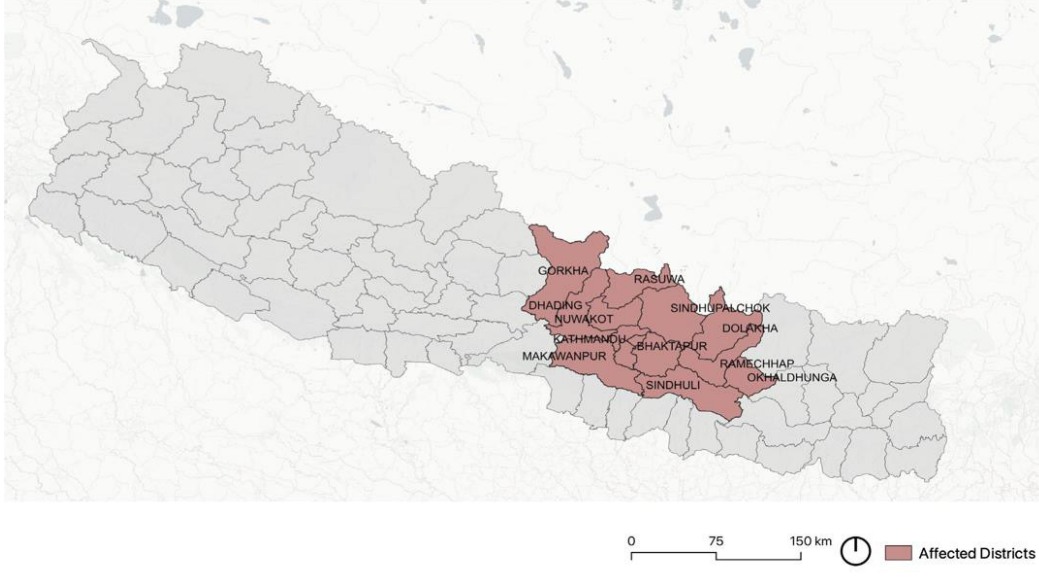

Figure 1: Affected Areas Include Areas Where There has been a Damage to Structures, Physical Infrastructure, and Roads | Situation Report, Shelter Cluster Nepal, November 2015

In the immediate aftermath of the earthquake, about $4.1 billion was pledged by donors to help reconstruct Nepal, led by a donor consortium of bilateral, multilateral and international donors. Since this pledge, there has been a significant increase in both the number of projects and the operational presence of aid in Nepal. According to the Social Welfare Council (SWC), the apex regulatory authority in Nepal for NGOs, there were 39,759 NGOs registered between 1977 and 2014 in Nepal, which increased to over 50,000 NGOs right after the earthquake (Karkee et al., 2016). There were 232 operational INGOs in Nepal before the earthquake, which rose to 250 post the earthquake. The aid avalanche that followed upended Nepal's urban development patterns in beneficiary cities.

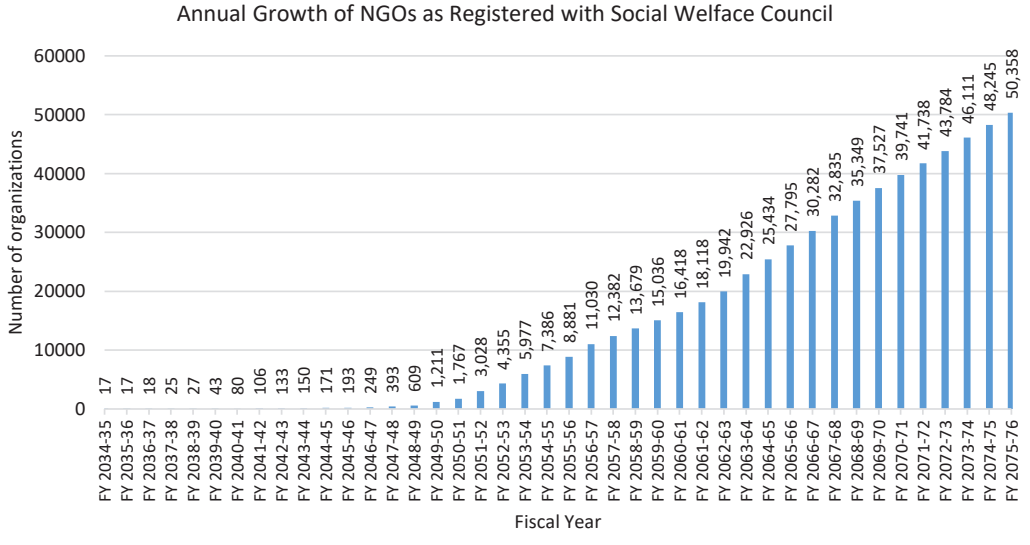

Figure 2: Increase in the Number of NGOs Registered with the Social Welfare Council. There were 232 operational INGOs in Nepal before the Earthquake, which rose to 250 post the earthquake. | Social Welfare Council, 2023

2. Knowledge Gap

2.1 Inequities in Aid Distribution in Nepal

Literature on international aid-funded urban development in Nepal post-earthquake suggests a pattern of gentrification, particularly in historic settlements like Lalitpur near Patan Durbar Square, where traditional Newari homes are increasingly converted into Airbnbs through foreign investment (Bajracharya, 2017; Sengupta, 2022). Scholars have noted that development projects in Nepal often produce unintended economic, social, cultural, and ideological impacts on local communities (Fehr, 2022). Following the 2015 earthquake, aid distribution in Kathmandu favored higher-caste, wealthier neighborhoods, disproportionately disadvantaging lower-income and lower-caste communities further from the city center (Eichenauer et al., 2020). This growing urban inequity can exacerbate social conflicts (De Juan, Pierskalla, and Schwarz, 2020), an issue requiring further investigation. While research has explored the roles of government, social actors, and international development groups in urban change (Daly et al., 2017), there is a gap in understanding how international aid contributes to rising inequity and gentrification from a spatial and urban perspective. This paper addresses this gap using quantitative analysis of open-source geospatial data, rental, and land values.

3. Problem Statement

3.1 An Ad-hoc Post Disaster Policy Environment

At the time of the earthquake, land development in Lalitpur was governed by the National Land Use Policy of 2012, while urban development in the Kathmandu Valley, including Lalitpur and Kathmandu, was guided by the Long-Term Development Concept Plan of 2002 (Kathmandu Valley Development Authority, 2015). Despite having these urban development master plans in place, many neighborhoods had been growing organically and haphazardly (Bloomberg,2015). The influx of international aid in Nepal had been thriving even before the earthquake, largely due to the government's free-market policies and a favorable regulatory environment established following the restoration of a multi-party democratic system in 1990 (Karkee et al., 2016). The Social Welfare Act of 1992 led to the creation of the Social Welfare Council (SWC), which has since monitored and recorded the presence and funding of NGOs within the country, albeit in a limited capacity (S Malik, 2023, personal communication).

Although the Nepalese government had been aware of the likelihood of a major earthquake, there were no fully functional disaster management agencies at the time (Chaudhary, 2020). The National Reconstruction Authority (NRA) was established as an emergency measure in 2016 following the earthquake but has since ceased to exist, with its remaining responsibilities and capital transferred to the Department of Urban Development and Building Construction and the National Disaster Risk Reduction and Management Authority (NDRRMA). This policy environment—characterized by uncontrolled urbanization, increasing foreign aid presence, uncertain governance, and underdeveloped disaster management policies—further exacerbated the effects of the earthquake.

3.2 Inequities in Urban Patterns of Aid Distributions

Of the 14 municipalities with significant earthquake damage, urban areas in Nepal were notable because they suffered damages in Wards such as the heritage squares of Patan Durbar Square. However, even though 25% of all damaged structures were in urban areas of Kathmandu and Lalitpur, these areas were largely overlooked in the immediate international humanitarian response (Shelter Cluster Nepal , 2015), due to lack of funding, lack of clarity about land and property rights, and inefficiencies in interacting with administrative bodies at the time of the disaster, even though they equally bore the impact of the earthquake (L. Sharma; P. Kadariya; Y. Sharma; S. Lama, personal communications, January 2023).

Nonetheless, even though urban areas were overlooked as project site locations in the immediate aftermath of the earthquake, the operational presence of INGOs and humanitarian groups conglomerated in urban areas for a range of up to 5 years after the 2015 event (S. Malik, personal communication, January, 2023).

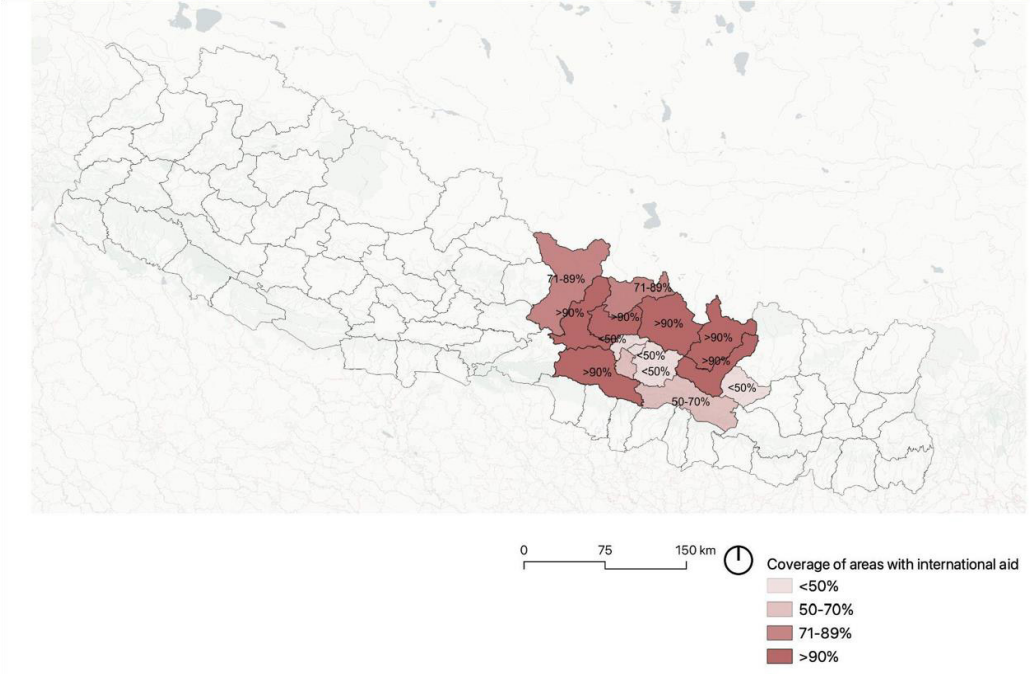

Figure 3: Coverage of Areas by International Aid | Shelter Cluster Factsheet, November 2015

According to the Social Welfare Council, 17 new INGOs started operating in Kathmandu and Lalitpur after the 2015 earthquake, out of which ten remained by 2017. Several INGOs in the country altered their existing operations to cater to the pressing needs of earthquake response, thereby increasing INGO presence and reach.

3.3 Hypothesis

Post-earthquake Nepal is a fascinating case study for Bello's theoretical definition of the 'relief and reconstruction complex', where he analyzed the motivations of the same key actors who emerge in post-disaster response across the world - namely the World Bank, INGOs and the US military and political command, to push privatization and soft diplomacy agendas (Bello, 2006). Carolini (2021) goes a step further to analyze not just the motivations of development agencies but the negative externalities that emerge from their impact on urban neighborhoods— particularly

in capital cities where they headquarters—and enhanced urban inequities due to their presence and operations by conducting a much more spatially sound analysis (Carolini, 2021). Both theoretical frameworks are applicable in urban areas of Nepal.

This paper hypothesizes that reconstruction aid post-earthquake of 2015 led to an agglomeration or clustering of both the operational presence of aid workers and project presence (and benefits) in certain urban Wards, which led to intra-urban changes in Ward neighborhoods, creating pressures on rents, infrastructure, and access to amenities within Lalitpur which had not previously existed. Here, Lalitpur was chosen as a case study due to the dynamic nature of the emerging intra-Ward inequities within this urban municipality. A counterfactual study will be used to study if this hypothesis holds true in a comparable Ward and the spatial impact and extent of this change across neighbourhoods in Lalitpur particularly.

4. Research Methodology

This paper leverages a mixed methods approach—using both quantitative and qualitative methods—to explore Nepal's spatial and socio-economic imprint of aid operations after the 2015 earthquake. I use publicly available data from the National Reconstruction Authority, the Lalitpur Municipal Authority (LMA), the Kathmandu Valley Development Authority (KVDA), and the Housing Recovery and Reconstruction Platform (HRRP) to conduct a geospatial clustering analysis. I also used semi-structured qualitative interviews collected across selected sites using stratified sampling to select interviews in a transect walk within particular Wards. In addition, Ward officers' focus group interviews and targeted interviews were also collected. All interviews were coded for patterns of neighborhood change, and externalities spatialized within respective Wards.

4.1 Profiling of Variables

4.1.1 Profile of Built Projects

Public projects such as schools, healthcare, healthcare, and historical structures were enumerated as aid projects. Housing projects with more than 80% of their aid contributions through international aid were also enumerated.

4.1.2 Profile of Personnel

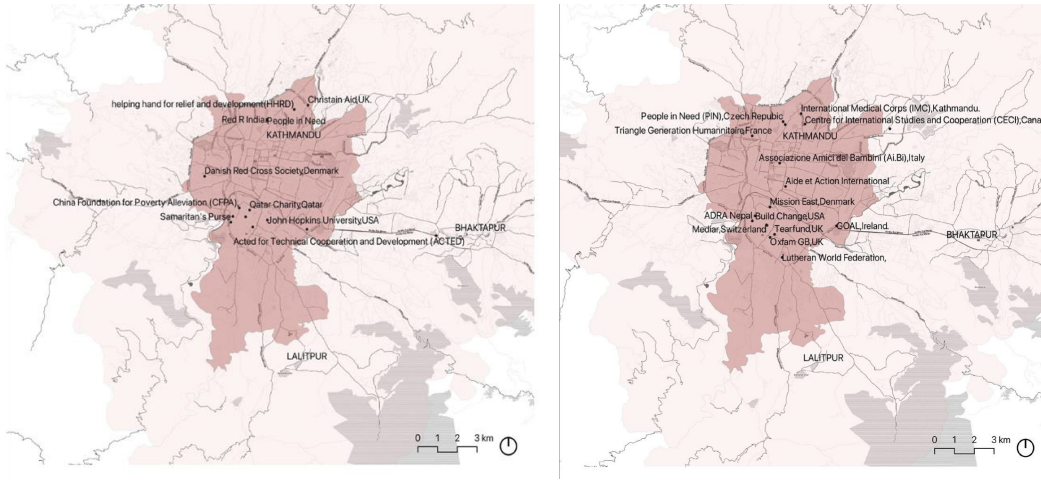

Figure 4: INGOs Operating in Kathmandu and Lalitpur in 2015-16 and 2016-17

Figure 5: INGOs Operating in Kathmandu and Lalitpur in 2017-18 | NGOs Operating in Kathmandu and Lalitpur in 2018-19

This paper focuses on studying long-term foreign aid workers who typically stay on for 3-5 years, often in managerial roles, and have distinct needs, including housing, schools for their families, and culturally specific amenities. These personnel are

contrasted with short-term humanitarian workers, who tend to be younger and stay for shorter periods. The long-term workers were chosen for the study due to their significant impact on local infrastructure and urban areas, as they often lead to developing specialized facilities and retrofitting buildings to meet their needs. These aid workers' physical presence and outposts, including their headquarters, embassies, and living quarters, were examined to understand their spatial influence on the urban environment.

4.2 Site Context

This paper will focus on Lalitpur as an emerging urban area that has imbibed the impacts of both post-earthquake reconstruction and the operational presence of embassies and INGOs. It will analyze the spatial distribution of emergency reconstruction aid in the aftermath of the earthquake across Wards in Lalitpur.

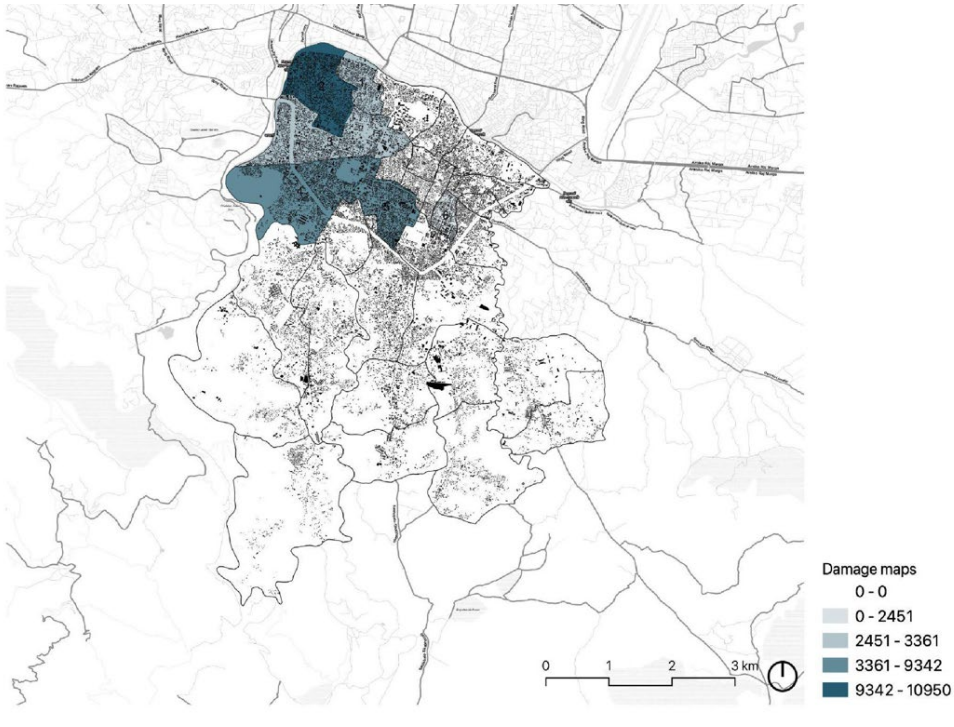

Figure 6: Distribution of Damage Across Lalitpur Wards After the 2015 Earthquake | One of the limitations of assessing damage across the wards in lalitpur is the concentration of data in the northwest wards closer to kathmandu city. It is difficult to ascertain whether this is because these were the only wards that were surveyed due to ease of access of ngos or because this a geo aggregation has gone wrong | Readapted from the National Reconstruction Authority portal, accessed in 2023

The spatial clustering of projects built by international aid within Lalitpur is concentrated within the northern part of the Mahanagarpalika (Metropolitan City) in Wards 2 and 3 and the southwestern parts of the metropolitan area in Wards 21 and 22. Analysis of the distribution of INGOs, embassies and projects in Lalitpur Metropolitan City, one finds that there is a clustering and subsequent increase in the number of personnel that lived in Lalitpur after the earthquake, within Ward No. 2, 3 and 1, where most of the INGO presence is located.

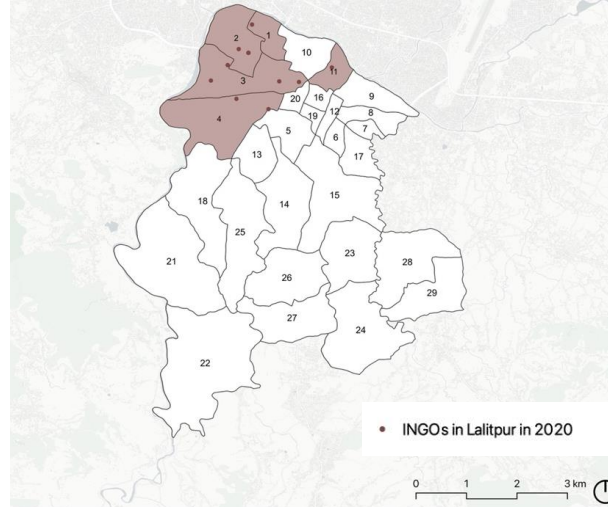

Figure 7: Wards 1, 2, 3, 4 and 11 have the most concentration of INGOs and embassies in 2020

In addition, a counterfactual analysis was conducted in Ward No. 26, which officials of the Lalitpur Municipal Authority pointed out as one of the most underdeveloped Wards in Lalitpur Metropolitan City. Further, city officials mentioned Ward No. 26 as one of the few urban Wards that received very little aid intervention compared to other Wards. "A counterfactual is a statement about how things occur in other possible worlds governed by the same laws of nature" (Lewis, 1973). To challenge the supposition that there was an impact of pressures of operational and project presence of foreign aid workers in various Wards in Lalitpur, Ward No. 26 with no known presence of projects and personnel was studied through the same methods.

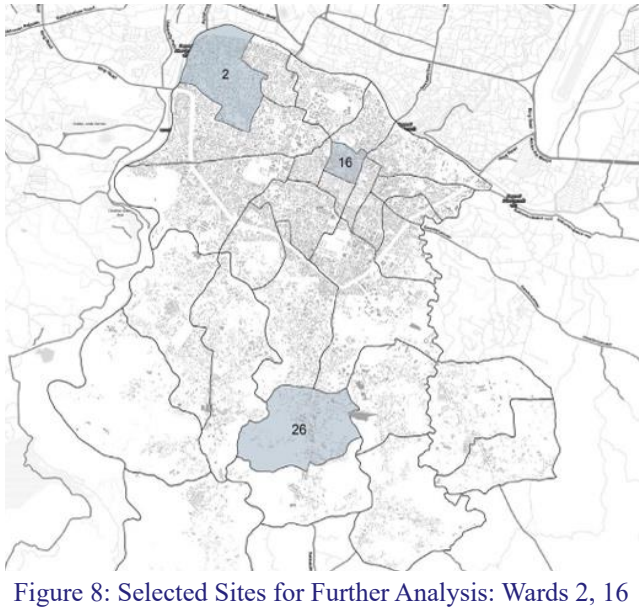

Figure 8: Selected Sites for Further Analysis: Wards 2, 16 and 26

5. Results

The paper conducted qualitative interviews of key stakeholders and small business owners in Wards 2,16, and 26 across a 1 km-1.5 km stretch, with up to 5 interviews across a uniform survey questionnaire, as seen in the Appendix. Interviewees were selected from a spectrum of professions and a range of tenancies, including renters and owners. One limitation of this study is that interviewees were selected on the basis of their availability on the particular day of the interview, not across a time period.

5.1 Areas of Analysis – Ward No. 2, 16, 26

5.1.1 Sanepa - Ward No. 2

The random sampling interviews mainly focused on hospitality and service providers within the area, as they kept a log of customer preferences and customer turnout within the area. In the aftermath of the earthquake and COVID pandemic, hospitality and service providers in Lalitpur's Ward 2 experienced shifts in customer demographics, with a higher percentage of non-Nepali and higher income Nepali customers, leading to menu diversification and rent increases. For grocery store owners, catering to the international population spurred product diversification, while closures of local eateries highlighted neighborhood changes, with rising rents driving out traditional businesses. Despite challenges, improved infrastructure and services characterize Ward 2 as one of Lalitpur's best-served areas.

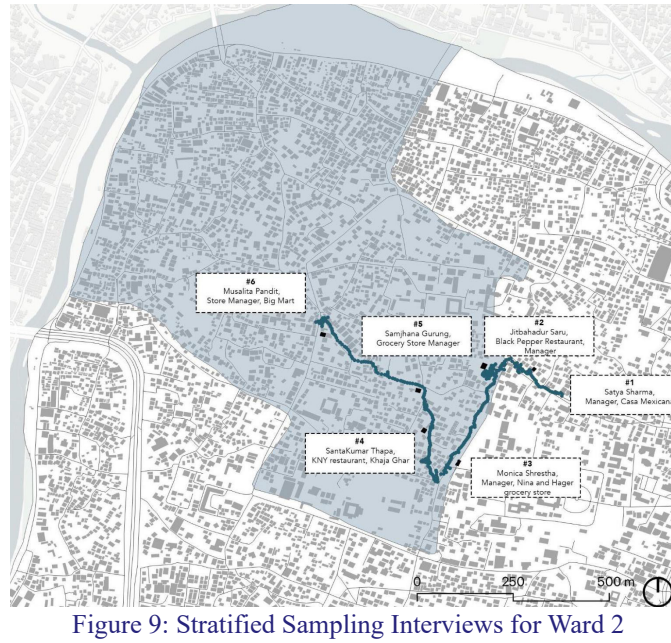

Figure 9: Stratified Sampling Interviews for Ward 2

5.1.2 Patan Durbar Square - Ward No. 16.

Ward No. 16 is home to the UNESCO World Heritage Site Patan Durbar Square area, which is a historic palace square dating back to the 15th Century. This historically

has been the old city and city center, and therefore was one of the neighborhoods with the highest rents. Since its UNESCO designation in 1979, Patan Durbar Square and the adjoining area have been a hub of tourist attractions and commercial.

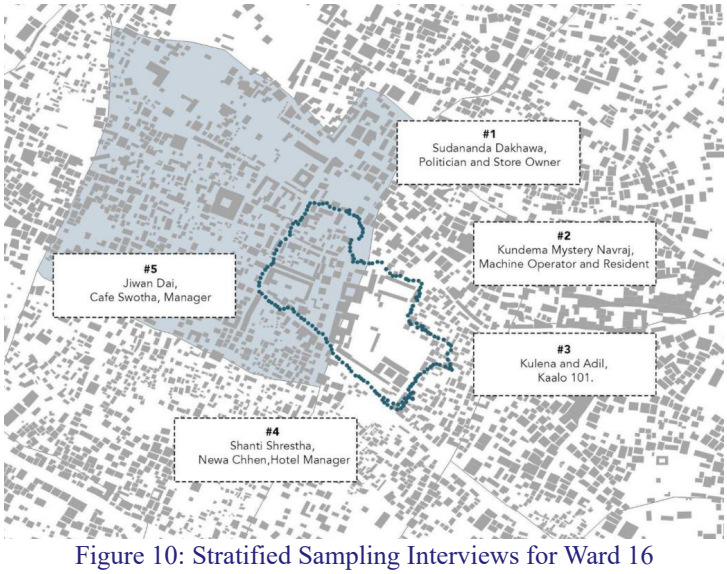

Figure 10: Stratified Sampling Interviews for Ward 16

The Ward encompassing Patan Durbar Square, a UNESCO heritage site, has seen significant reconstruction efforts post-earthquake, with donor funds channeled through organizations like Kathmandu Valley Preservation Trust (KVPT) and UNESCO. This concentrated interest has led to a transformation in housing dynamics, with abandoned structures repurposed for art studios and boutique hotels, catering primarily to tourists and expats. However, this influx of funds has also created disparities, with some struggling to access grants for heritage conservation. In contrast, others exploit the opportunity for commercial gain, contributing to neighborhood gentrification and shifting away from traditional livelihoods. Overall, the evolving landscape reflects a complex interplay of tourism, globalization, and privatization, complicating efforts to isolate the specific impacts of the earthquake and aid initiatives.

5.1.3 Sunakothi - Ward No. 26

Sunakothi is a neighborhood to the southernmost end of the Lalitpur Metropolitan City. It is a recently bifurcated Village Development Committee that has been devolved into two Wards.

Ward No. 26 (Sunakothi) was chosen as a counterfactual study of the impacts and effects of international reconstruction aid in Lalitpur. As per the NRA and the HRRP websites, there are no known partner organizations and/or projects within the Ward boundaries, and there has been no known recollection of any international NGO working within Sunakothi either before or after the earthquake by the officials in the Ward office no. 26. Ward officials note minimal interest from INGOs post-earthquake,

with only government-led reconstruction efforts observed. Sunakothi experienced demographic shifts through internal migration, with residents predominantly commuting to Lalitpur or Kathmandu for work. Rent and land prices increased marginally post-earthquake, accompanied by densification and loss of open spaces, raising concerns about community resilience to future disasters. Additionally, the preference for NRA-certified seismic structures has driven up housing prices, contributing to small yet noticeable neighborhood changes.

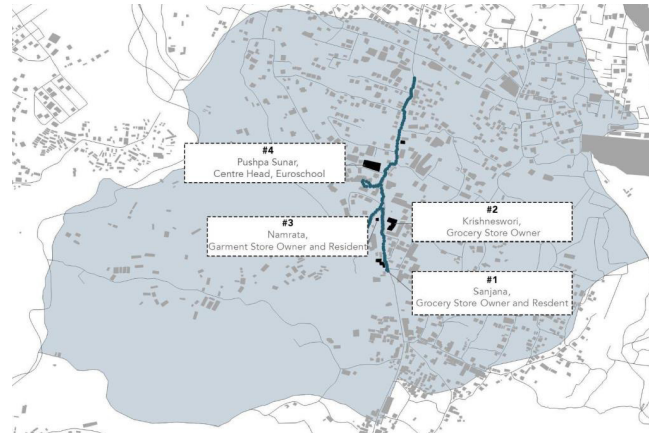

Figure 11: Stratified Sampling Interviews for Ward 26

5.2 Building Construction Analysis of Selected Wards

The paper analyzed quantitative data, such as the year-on-year increase in building permits from 2015 to 2022, as provided by the Lalitpur Electronic Building Permit System and Lalitpur Metropolitan Authority. The building permits data also includes information on retrofits, restoration, and new construction.

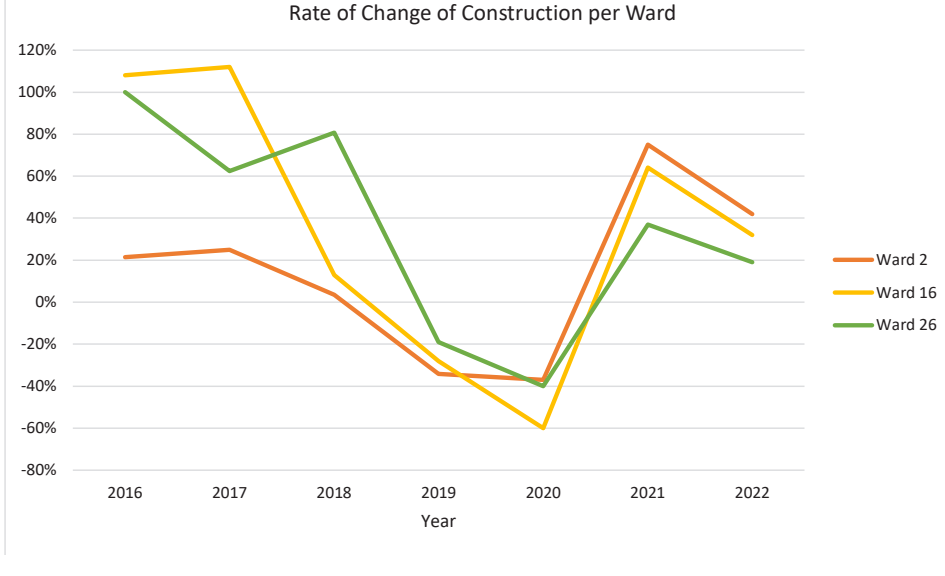

Figure 12: Rate of Construction Across Wards 2, 16, 26 Across Time Series Data From 2015 – 2022

5.3 Land Value Analysis of Selected Wards

Land values in Lalitpur are predetermined by a government-regulated formula, which is set per aana and based on proximities from main, secondary, and tertiary roads (See Appendix A).

Land prices are speculative and rise and fall according to informal market transactions (S. Shrestha, personal communication, January 2023). The difference between current prices and baseline rates can be estimated as a percentage increase (See Appendix B for reasoning and methods of deduction).

Table 1: Increase in Land Values From 2010 to 2023 as Tabulated From Random Sampling Interviews

Land type	Ward No. 2	Increase from baseline	Ward No. 16	Increase from baseline	Ward No. 26	Increase from baseline
For sale - Primary road type	55 lac per aana	254% increase	45 lac per aana	25% increase	22 lac per aana	53% increase

5.4 Rent Analysis of Lalitpur Wards

In order to understand the trend of rental rates within Ward No. 26, 16 and 2 after the earthquake and in comparison, to each other presently, rental information was scraped from four major publicly available rental information websites such as 99 aanas, GharGhaderi, Nepal Homes and Green Real Estate over the period of one month from March to April 2023. In addition, the paper looked at AirBnB websites to determine the prices of short-term leases (See Appendix C). The above rent and housing prices were further corroborated by talking to real estate brokers who conducted these transactions, particularly in Ward No. 2 (See Appendix D).

6. Discussion

6.1 Ward-Wise Sampling Results

As a mid-rise, mid-density and fairly residential enclave, Ward No. 2 belies the assumption that it is one of the wealthiest Wards in Lalitpur. However, it is one of the largest property taxpayers in the metropolitan area and has the largest percentage of commercial areas in LMC (Paudel, 2022). The stratified sampling results indicate that there has been a rising gap between the purchasing power of locals vs expats in Sanepa and Jhamsikhel, which can be attributed to the increase in the number of personnel in Ward No. 2 and 3. Ward No. 16 has also seen a change in demographics; however, the impacts of international aid alone cannot be sufficiently established since the Ward has been a heritage and historically high Ward since before the

earthquake. On the other hand, while rents and gentrification marginally increased in Ward No. 26, interviewees do not attribute it to the impacts of international aid projects or personnel.

6.2 Building Construction Analysis Results

Aside from the global changes in construction rates across all three Wards, each Ward has a rate of acceleration or deceleration of building construction services that reflect aid intervention. However, since all Wards reacted similarly to similar market forces and had similar numbers in terms of construction growth, this analysis also serves as a control factor to demonstrate the similarity in comparable Wards to analyze effects of an aid intervention separate from market forces

6.3 Land Value Analysis Results

The total area encompassed by the highest value lands within each Ward is the highest in Ward No. 2 and Ward No. 26. Land tax is levied at a rate of 0.01% to properties (land+ property) ranging over an NPR 0.2 million. This calculation gives us an approximation that Ward No. 2 is one of the richest in terms of cumulative land value, while Ward No.16 is the lowest (even though it is priced higher per sq. ft. rate). The most interesting deduction from this data is the price increase rate across Wards as per speculative pricing. Ward No. 2 registers a whopping 254% increase as compared to Ward No. 16's 25% increase. Ward No. 26 is also increasing in speculative land pricing, but not at the rate of Ward No. 2.

6.4 Rent Value Analysis Results

Ward No. 2's showed exorbitant rent differentials for expats and locals. A rented apartment for an expat costs about a couple of hundred dollars more than the rent of the same apartment for a Nepali person. The effect of this price differential in rents is the collective raising of rent ceilings for the entire Ward. These are rents for furnished apartments with amenities such as heating and air conditioning - all luxuries for a regular apartment owner in Lalitpur and are not uncommon, particularly in Ward No. 2 (M. Anthony, personal communication, January 2023). Further, each interviewee in the random sampling process shared the rents they paid for their home or establishment, and their results were tabulated (See Appendix E). Ward No. 2 again emerges as the Ward with the highest rental and property values of all three Wards. Additionally, there is also an intra-Ward variation in the rents that a local pays vs the rent that an expat is expected to pay, which at times is three times more than current market rates, thereby creating inequities in access to housing.

7. Conclusion

This analysis reveals opportunistic buying across all three Wards in Lalitpur post-earthquake, driven by low rent values, increased job opportunities, and migration (S. Shrestha, personal communication, January 2023). These changes can be directly attributed to the impact of the earthquake. The paper's main hypothesis is that international aid accelerates neighborhood change and contributes to gentrification. The findings show significant speculation and rising rents in Ward 2, while Ward 16 experienced a decline in rent contrary to gentrification patterns suggested in previous studies (Bajracharya, 2017; Haselberger and Krist, 2020). This decline is linked to heritage retrofitting grants that attracted younger renters and artists, contradicting traditional gentrification models.

Additionally, the study highlights the overlooked impact of international aid workers on urban dynamics. Similar to Carolini's findings in Maputo (Carolini, 2021), Sanepa (Ward 2) saw sharp increases in rent, land values (254%), and housing prices ($600-$1,200) due to the influx of aid workers, displacing small businesses and low-income residents. These changes indicate that the presence of aid personnel has a more substantial impact than aid projects themselves. The findings also reveal increasing intra-urban inequalities in Lalitpur, driven by diverse rates of neighborhood change.

8. Recommendations

This paper offers a range of policy recommendations to stakeholder groups within this discussion of the role and range of aid in post-disaster reconstruction in Nepal, and for researchers who wish to study the scalar relationships between international aid and disaster recovery in South Asian cities.

The following policy recommendations are for various agencies and communities including Municipalities, Watchdog institutions, disaster management authorities, Aid organizations and research communities.

1) **Conduct a broader study to understand funding and aid needs post-disaster at the Ward level**: Post-earthquake aid distribution revealed significant urban inequities and over-reliance on external funding, weakening local capacity. It is recommended to establish a comprehensive methodology and plan of action for conducting Rapid Post-Disaster Needs Assessments at the ward level, to understand funding needs. This approach should also include accurate calculations of funding requirements from aid, central government contributions, and own-source revenue.

2) **Implement land use policies to prepare for both slow onset and rapid onset disasters at a Municipality level**: Land use plans and development policies, such as Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015 - 2035) for Kathmandu Valley, serve as critical tools for regulating spatial development at the ward level. Our analysis, which employed geospatial and rental assessments, has revealed not just a lack of disaster preparedness but a mismatch between long-term development agendas and realities on the ground. To address these disparities, land use plans should be leveraged to prepare for disaster risk, compare the rate of development between municipalities and mitigate the growing inequities within wards.
3) **Establish partnerships with all stakeholders to build resilience:** As several grassroots NGOs and community groups pointed out in this paper, the mismatch in motivations of aid agencies, agendas and capacities of ward officials, and the priorities of those impacts led to an unequal and prolonged recovery process. Establishing a relationship with all partnerships across all stakeholders, including government agencies, local and international NGOs and civil society groups before the onset of the disaster will allow for all stakeholders to operate from a space of transparency and collaboration and avoid the duplication of efforts. This can be achieved by having a platform where all parties can agree upon blended finance strategies for development.
4) **Enhance monitoring of project impacts by the Social Welfare Council:** Interviews with representatives from the Social Welfare Council reveal significant gaps in the monitoring and evaluation mechanisms applied to international non-governmental organizations (INGOs). These gaps extend over prolonged periods and surpass the immediate boundaries of project-specific outcomes. Enhancing the regulatory scope of the Social Welfare Council to include comprehensive oversight of INGOs—encompassing both short-term and long-term evaluations of their operational presence, aid distribution practices, and overall impact—could significantly improve transparency.
5) **Separate responsibilities within disaster management at administrative levels:** Prior to the establishment of the National Reconstruction Authority (NRA), NGOs highlighted significant coordination challenges between government agencies and NGO representatives at both the ward and city levels. These challenges exacerbated disparities in the distribution of resources and services across different wards. In response, the National Disaster Risk Reduction and Management Authority (NDRRMA) has implemented a three-tier disaster management system encompassing central, provincial, and local

levels. While this decentralization represents progress, it is crucial to further enhance the framework by instituting mechanisms for transparency and ongoing dialogue at each level of governance.

6) **Improve urban data capacities of municipalities:** Given that the findings of this paper can be readily replicated by metropolitan agencies to monitor the impact and benefits of post-disaster projects and aid within their respective wards, the analysis is built on open-source data. Strengthening the capacities of local bodies by providing them with the necessary tools, training, and resources to leverage existing resources is essential. This will empower local agencies to effectively utilize open-source data for continuous monitoring and evaluation, ensuring that post-disaster interventions are both equitable and aligned with long-term development goals.
7) **Tailor aid strategies to long-term impacts of aid agencies:** Similar to the challenges faced by the SWC, this paper identifies that program monitoring and evaluation conducted by international NGOs have limitations. These limitations often restrict the assessment to the immediate benefits of the project. The paper recommends expanding the scope of impact measurement to include not only the direct effects of aid projects but also the broader impacts on personnel needs and any resulting externalities that extend beyond the specified project timeframe.
8) **Establish research methods to address dual perspectives on urban change and their causal factors:** The current body of research on post-earthquake reconstruction in Nepal overlooks critical knowledge gaps related to the role of international aid and the gentrification that follows disasters. This paper recommends adopting a spatial analysis approach to quantify these changes in the municipality under study and other urban areas facing similar dynamics. This method would contribute to developing a comprehensive framework for assessing the factors driving gentrification in neighborhoods experiencing significant post-disaster development.

9. Suggested Course of Action

The policy recommendations made above have been further elaborated by identifying the responsible agency, the suggested/anticipated role and action, and expected outcomes. These suggestions are logical extensions of the recommendation and have not been validated by the agency representatives at this point. Therefore, these should be regarded as helpful tips.

Recommendation	Suggested Action	Outcome
1. Conduct a broader study to understand funding and aid needs post disaster at the Ward level	Develop a methodology and plan of action to conduct Rapid Post Disaster Needs Assessments at the Ward level, as opposed to the national level alone, and establish accurate funding needs from aid, from central governments and from own source revenue	By decentralizing the needs assessment at a local level, each ward will be able to improve decision making, able to allocate resources accordingly, enhance fiscal resilience at the local level and be able to leverage existing local knowledge.
2. Implement land use policies to prepare for both slow onset and rapid onset disasters at the Municipalility level	Utilize spatial policy instruments such as the Vision 2035 and Beyond: 20 Years Strategic Development Master Plan (2015 - 2035) for Kathmandu Valley	Utilizing spatial policy instruments will help with risk informed land use planning, alignment of development agendas with realities on the ground and improved coordination between municipalities over an extended and prescribed period of time
3. Establish partnerships to build resilience amongst all stakeholders	Establish a relationship with all partnership across all stakeholders including government agencies, local and international NGOs and civil society groups before the onset of the disaster by imagining blended finance strategies	Utilizing blended finance strategies, which combine public, private, and philanthropic funding sources, would create a more sustainable and diverse pool of financial resources to support resilience-building activities before and after disasters. This will help foster relationships and trust between all actors towards shared goals.
4. Enhance monitoring of project impacts at the SWC	Incorporate a framework to quantitatively monitor and evaluate the impact of aid agencies and their personnel on local areas, with a long term perspective rather than short term project gains	A robust monitoring framework ensures that aid agencies are held accountable for their actions by the SWC, focusing on long-term outcomes rather than short-term project gains.
5. Separate responsibilities within disaster management within NDRRMA	Integrate a three-tier disaster management system to clarify NGO roles at provincial, district, and local levels, and establish channels of communication where INGO feedback and presence can be regulated	Improved efficiency, accountability and transparency at all administrative levels will help create clear channels of communication at the onset of the next disaster
6. Improve urban data capacities at the municipality level	Strengthen local authorities' frameworks to maintain autonomy and monitor their wards by training staff on readily available open source data and software	This will empower local agencies to effectively utilize open-source data for continuous monitoring and evaluation, ensuring that post-disaster interventions are both equitable and aligned with long-term development goals.

Recommendation	Suggested Action	Outcome
7. Tailor aid strategies to long-term impacts for aid agencies	Ensure aid strategies consider long-term impacts, including infrastructure needs and local amenities amenable to long term presence to monitor their externalities	This action will ensure that aid agencies are mindful of the duration of personnel intervention and adjust their operations to minimize the long-term impact on the neighborhoods in which they operate
8. Establish research methodologies to address dual perspectives on urban change and their causal factors	Establish robust methods to explore causal relationships between urban gentrification and underlying factors	This would contribute to developing a comprehensive framework for assessing the factors driving gentrification in neighborhoods experiencing significant development.

Author Contribution

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Conflict of Interest Statement

The author has no conflict of interests to declare.

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Appendix

Appendix A: Primary, Secondary and Tertiary Road Buffers for Wards 2, 16 and 26

Appendix B: Land Value Calculations as per Kathmandu Valley Developmemt Authority Data and Buffer Analysis

	Primary Road Buffer (Sum Area sq.m.)	Secondary Road Buffer (Sum Area sq.m.)	Tertiary Road Buffer (Sum Area sq.m.)	Total Saleable Area and Profits	Per Aana Baseline Calculations
Ward 2	634746.46	109778.58	78470.52	822955.56	
Multiplier	1550000	1300000	800000		1550000
Total Ward 2	983857013000	142712154000	62776412000	1189345579000	

	Primary Road Buffer (Sum Area sq.m.)	Secondary Road Buffer (Sum Area sq.m.)	Tertiary Road Buffer (Sum Area sq.m.)	Total Saleable Area and Profits	Per Aana Baseline Calculations
Ward 16	158791.32	31790.89	15479.47	206061.68	
Multiplier	3750000	1650000	175000		3750000
Total Ward 16	595467457500	52454968500	2708907075	650631333075	
Ward 26	675935.051			675935.051	
Multiplier	1300000				1300000
Total Ward 26	878715566300			878715566300	

Appendix C: Sales Comparison Method for Rental Variation Across Wards 2, 16, And 26

Rental Agency	Ward No. 2 (NPR per sq.ft)	Ward No. 16 (NPR per sq.ft)	Ward No. 26 (NPR per sq.ft)
Comp 1 (GharGhaderi.com)	143	409	111
Comp 2 (NepalHomes)	130	15	32.89
Comp 3 (AirBnB)	$14 - 76 a night	$11- 65 a night	$10-30 usd a night
Comp 4 (99aana)	116	-	-
Comp 5 (Green Real Estate)	83	-	-

Sources: As Above

Appendix D: Estimates from Ward No. 2 Real Estate Broker 'Green Real Estate'

Inside the ring road

1 bedroom = 50,000 NPR to expats (foreign aid workers in this case)

1 bedroom = 35000 NPR to a Nepali person (unfurnished)

Outside ring road

1 bedroom = 15000 NPR (expats choose not to live outside the ring road)

The following are the rates of buying a house for a local Nepali person:

1 bedroom = 1.25 lacs NPR

Expats are not allowed by law to buy a house. However, many expats in Sanepa form co ownership agreements with local Nepalis to buy property.

The following are the rental rates within Sanepa for a local Nepali person

1 sq ft = 1.25 NPR for a ground floor space, with spaces ranging from 3000 – 4000 feet. There has been an increasing trend of rents in Kumaripati, Bhaisipati and Pulchowk (Ward 3) after a market saturation in Sanepa, which corroborates with SWC's evaluation of an increasing trend of newer NGOs to migrate to these areas.

Appendix E: Average Rents per Ward as Estimated from Random Sampling Results Across Wards 2, 16, 26 as Collected in January 2023

Type of Space	Ward No. 2	% Increase in Rents After Earthquake	Ward No. 16	% Increase in Rents After Earthquake	Ward No.26	% Increase in Rents After Earthquake
Furnished room for rent	5000 NPR per room - 1200 usd per room	10-15%	15000 NPR for a room in a heritage structure	10%	4000-15000 NPR	NA
Commercial shop	25000 NPR	5-10%	NA	Decrease	2000-6000 NPR	10%
Airbnb rates	$30 per night	-	$20 per night	-		-
Studio space	55,000 NPR	10%	22,000 NPR	10%	20000 NPR	10%