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# Slum Settlement Handling As An Instrument Of Disaster Resilience : A Qualiitative Documen Analysis Of Planning And Evaluation Frameworks In Padang Lawas Utara Regency, North Sumatera, Indonesia

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**Abstract**

*Padang Lawas Utara Regency, North Sumatra, faces the dual challenge of reducing slum settlements while strengthening disaster resilience. Although these agendas are mandated by separate national regulations and implemented through different planning instruments, they frequently intersect because informal settlements often occupy hazard-prone areas. This study examines the extent to which slum-settlement management in Padang Lawas Utara can be positioned as an instrument for enhancing district-level disaster resilience rather than as a stand-alone infrastructure program. Using a qualitative document-analysis approach, the research analyzes the 2023 Regency Decree on Slum Locations, regional planning and disaster-management documents, institutional records, and a household-level case study of Kelurahan Pasar Gunungtua. The analysis focuses on four dimensions: settlement characteristics, spatial overlap between slums and hazards, policy integration, and monitoring and evaluation practices. The findings reveal significant institutional fragmentation. The slum-location decree does not explicitly reference disaster-management regulations, the district's most severe documented hazard event occurred outside designated slum areas, and existing academic research on the largest slum settlement emphasizes socio-economic conditions without assessing disaster risk. To address these gaps, the study proposes a Disaster-Resilient Slum Handling model that integrates hazard mapping into slum planning, incorporates resilience indicators into settlement improvement programs, and*



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*strengthens inter-agency coordination and joint monitoring between housing authorities and the Regional Disaster Management Agency (BPBD).*

**Keywords: Slum Settlements; Disaster Resilience; Regional Planning; Padang Lawas Utara**

## INTRODUCTION

Rapid and unplanned urban growth in many parts of Indonesia has produced settlements that fall below minimum standards of habitability, commonly identified as slum or kumuh areas (Harahap et al., 2024). Such settlements typically emerge from a combination of rural push factors and urban pull factors, compounded by limited public capacity to provide affordable housing infrastructure at the pace of population growth (Fitri, 2021, as cited in Harahap et al., 2024). As land in urban centres becomes scarcer and more expensive, low-income households are pushed toward marginal and often hazard-prone land especially riverbanks, floodplains, and unstable slopes — where housing is self-built with substandard materials and without reference to construction or planning guidelines (Beddu & Yahya, 2015, as cited in Harahap et al., 2024).

Padang Lawas Utara Regency, formed in 2007, illustrates this pattern at a district scale. Through Keputusan Bupati Padang Lawas Utara Nomor 181.1/23/K/2023 tentang Penetapan Lokasi Lingkungan Perumahan dan Permukiman Kumuh di Kabupaten Padang Lawas Utara Tahun 2023 (hereafter the SK Bupati), the regency government formally designated 109.80 hectares of slum housing and settlement area across thirteen locations in five sub-districts, replacing an earlier designation decree from 2018 (Bupati Padang Lawas Utara, 2023). This decree functions as the legal basis for the regency's Rencana Aksi Peningkatan Kualitas Perumahan Kumuh dan Permukiman Kumuh (RP2KPKP) and situates slum handling squarely within the sectoral framework of housing and settlement law (Republik Indonesia, 2011).

What the decree does not do — and what this article seeks to problematise — is connect slum designation to the regency's disaster-risk profile. Undang-Undang Nomor 24 Tahun 2007 tentang Penanggulangan Bencana (Republik Indonesia, 2007) is absent from the decree's legal-basis clauses (Bupati Padang Lawas Utara, 2023), even though the physical and socio-economic conditions documented in an independent empirical study of the regency's largest slum concentration, Pasar Gunung Tua Village (Harahap et al., 2024), describe precisely the kind of structural fragility and low adaptive capacity that disaster-resilience literature treats as core vulnerability indicators (UNDRR, 2015; Bruneau et al., 2003). This article therefore asks: to what extent does the documented condition of slum settlements in Padang Lawas Utara constitute



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disaster vulnerability, and how might the regency's existing slum-handling instrument be reframed as a disaster resilience instrument rather than a housing-quality instrument alone?

To answer this question, the study applies a qualitative document-analysis method to two categories of source material: a normative-legal planning document (Bupati Padang Lawas Utara, 2023, and its lampiran) and an evaluative-empirical research document (Harahap et al., 2024). The remainder of the article is organised as follows: an overview of slum conditions in the regency; an overview of disaster-resilience concepts relevant to settlement vulnerability; a description of the document-analysis method; a theoretical synthesis; an examination of spatial/environmental and institutional dimensions; policy and planning implications; discussion; conclusion; and directions for future research.

## OVERVIEW OF SLUM SETTLEMENTS IN PADANG LAWAS UTARA

The SK Bupati designates slum locations across five sub-districts: Padang Bolak, Batang Onang, Portibi, Padang Bolak Tenggara, and Hulu Sihapas. Nine of the thirteen designated locations fall within Padang Bolak sub-district, which contains the regency's administrative centre, Gunungtua. Table 1 reproduces the distribution and area of each designated location as listed in the decree's lampiran (Bupati Padang Lawas Utara, 2023).

**Table 1. Designated Slum Locations in Padang Lawas Utara Regency (2023)**

| No | Kecamatan | Kelurahan/Desa | Slum Area (Ha) |
|---|---|---|---|
| 1 | Padang Bolak | Pasar Gunungtua – Lingkungan I & II | 13.77 |
| 2 | Padang Bolak | Pasar Gunungtua – Lingkungan III & IV | 12.78 |
| 3 | Padang Bolak | Pasar Gunungtua – Lingkungan V & VII | 14.39 |
| 4 | Padang Bolak | Pasar Gunungtua – Lingkungan V | 14.70 |
| 5 | Padang Bolak | Purba Sinomba | 11.91 |
| 6 | Padang Bolak | Batu Tambun | 2.11 |
| 7 | Padang Bolak | Batu Sundung | 2.91 |
| 8 | Padang Bolak | Hajoran | 2.21 |
| 9 | Padang Bolak | Sungai Orosan | 1.24 |
| 10 | Batang Onang | Pasar Matanggor | 7.06 |
| 11 | Portibi | Rondaman Dolok | 8.28 |
| 12 | Padang Bolak Tenggara | Naga Saribu | 8.22 |
| 13 | Hulu Sihapas | Aek Nauli | 10.22 |



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| No | Kecamatan | Kelurahan/Desa | Slum Area (Ha) |
|---|---|---|---|
| | | **Total** | **109.80** |

Four of the thirteen entries correspond to different lingkungan (neighbourhood units) within a single kelurahan, Pasar Gunung Tua, whose combined area, 13.77 + 12.78 + 14.39 + 14.70 hectares, totals 55.64 hectares, slightly over half of the regency-wide slum area. This concentration is consistent with an independent empirical study of Pasar Gunung Tua Village (Harahap et al., 2024), which identifies it as the only kelurahan in the regency classified entirely as a slum area and the one with the largest slum extent relative to other locations in the district.

That empirical study, based on a Slovin-formula sample of 97 household heads drawn proportionally from six lingkungan (out of a population of 3,874 households), used a weighted scoring method following Direktorat Jenderal Perumahan dan Permukiman Guideline No. 14 of 2018 and SNI 03-1733-2004 to classify housing conditions (Harahap et al., 2024). It found that 47% of housing units were in non-permanent, poor-quality condition; walls were predominantly wood plank (50%), roofing predominantly zinc (91%), and floors predominantly plastered (57%) though more than a third remained wood plank; and 50% of households lived at a density below 10 $m^2$ per person, well under the Indonesian minimum space standard of 9 $m^2$ per person applied to typical household sizes of four to five people (Harahap et al., 2024). Using these weighted indicators, the study classified 24.7% of sampled housing as heavily slum, 39.2% as moderately slum, and 36.1% as lightly slum (Harahap et al., 2024).

**OVERVIEW OF DISASTER RESILIENCE FRAMEWORKS**

Disaster resilience is conventionally understood as the capacity of a community or system to resist, absorb, accommodate, and recover from the effects of a hazard in a timely and efficient manner, a definition consistent with the Sendai Framework for Disaster Risk Reduction (UNDRR, 2015) and the widely used resilience-triangle formulation of Bruneau et al. (2003), which treats resilience as a function of robustness, redundancy, resourcefulness, and rapidity. Two dimensions of this framework are directly relevant to the documented condition of slum housing in Padang Lawas Utara.

The first is physical vulnerability. Housing built from wood plank walls and zinc roofing, without permanent structural elements, is more susceptible to fire spread, wind damage, and structural failure than permanent masonry construction (Harahap et al., 2024). High residential density compounds this exposure by limiting internal evacuation space and increasing the number


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of persons affected per unit of building failure (Bruneau et al., 2003).

The second is socio-economic vulnerability, understood in the disaster literature as a determinant of adaptive and recovery capacity rather than of hazard exposure itself (Berhanu et al., 2022). Low household income, informal employment, and limited education reduce a household's ability to self-finance repair or relocation after a hazard event, to access formal insurance or credit, and to interpret and act on early-warning information (Berhanu et al., 2022; Soma et al., 2022). Both dimensions are documented, independently of any disaster framing, in the empirical study of Pasar Gunung Tua Village (Harahap et al., 2024), and both are entirely absent from the vulnerability language of the SK Bupati (Bupati Padang Lawas Utara, 2023), which frames slum designation solely in terms of housing-quality standards under sectoral settlement law.

**DOCUMENT-BASED POLICY ANALYSIS**

This study adopts a qualitative document-analysis design, treating the SK Bupati and its lampiran (Bupati Padang Lawas Utara, 2023) as the primary normative-legal data source and the peer-reviewed empirical study of Pasar Gunung Tua Village (Harahap et al., 2024) as a secondary evaluative-empirical data source. Document analysis was chosen because both sources are official, publicly accountable records: the decree constitutes binding regional policy, while the empirical study constitutes an independently verified assessment of conditions within the regency's principal slum area, published in Jurnal Permukiman, Volume 20, Nomor 1, Mei 2024 (Harahap et al., 2024).

Analysis proceeded through three stages. First, the SK Bupati (Bupati Padang Lawas Utara, 2023) was reviewed to establish the spatial extent, administrative distribution, and legal basis of slum designation that can answering where slum conditions are formally recognised and under what regulatory framework. Second, the empirical study (Harahap et al., 2024) was reviewed to establish the physical and socio-economic drivers of slum conditions within the regency's largest designated area, wich means can answering why and how those conditions arise and persist. Third, findings from both documents were triangulated against disaster-resilience concepts (UNDRR, 2015; Bruneau et al., 2003) to assess the degree of correspondence between documented slum conditions and recognised vulnerability indicators, summarised in Table 2.


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**Table 2. Triangulation of Slum Vulnerability Indicators and Resilience Relevance**

| Vulnerability Dimension | Indicator (source document) | Resilience Relevance |
|---|---|---|
| Physical / structural | 47% non-permanent poor-quality buildings; 50% wood-plank walls; 91% zinc roofing (Harahap et al., 2024) | Fire spread potential, low wind/storm resistance |
| Spatial / density | 50% of households below 10 m²/person; 13 slum locations concentrated near river corridors (Bupati Padang Lawas Utara, 2023; Harahap et al., 2024) | Restricted evacuation space, flood exposure |
| Economic | 74% earn below regional minimum wage; 93% work in the informal sector (Harahap et al., 2024) | Low capacity to self-finance recovery |
| Educational | 59% completed only secondary education; 30% only primary (Harahap et al., 2024) | Limited access to formal risk information and early-warning literacy |
| Institutional | SK Bupati No. 181.1/23/K/2023 omits disaster-management law from its legal basis (Bupati Padang Lawas Utara, 2023; Republik Indonesia, 2007) | Sectoral policy silo; resilience not yet an explicit objective |

***Source: synthesised by the author(s) from Bupati Padang Lawas Utara (2023) and Harahap et al. (2024).***

**THEORETICAL INSIGHT**

The triangulation in Table 2 suggests that the two documents, though written for different purposes, together describe a coherent vulnerability–capacity structure consistent with asset-based livelihood frameworks used elsewhere in the slum literature (Berhanu et al., 2022), in which housing quality, income, employment, and social capital jointly determine a household's exposure and its capacity to recover from adverse events. The empirical study's chi-square analysis is instructive here: education, occupation, and income were found to be statistically significant determinants of house-level slum classification ($p < 0.05$), while household size and length of



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residence were not (Harahap et al., 2024). Read through a resilience lens (Bruneau et al., 2003), this pattern indicates that adaptive-capacity variables, the socio-economic assets a household can mobilise are more determinative of settlement fragility than demographic or tenure variables, reinforcing the argument that resilience-building interventions in this context should prioritise livelihood and education programming alongside physical housing improvement, rather than housing improvement alone.

At the same time, the physical-condition indicators (wall, roof, and floor materials; residential density) map onto the robustness component of the resilience triangle (Bruneau et al., 2003), describing the settlement's capacity to withstand a hazard event without failure. The SK Bupati (Bupati Padang Lawas Utara, 2023), by regulating only the spatial designation and administrative process for slum handling, addresses neither the robustness nor the adaptive-capacity component directly; it establishes where intervention should occur but not, within its own text, why that intervention matters for regional disaster resilience.

**SPATIAL AND ENVIRONMENTAL VULNERABILITY**

The spatial distribution recorded in the lampiran (Bupati Padang Lawas Utara, 2023) shows a strong concentration of designated slum area around Padang Bolak sub-district, adjacent to the regency's administrative and economic centre. Cartographic material accompanying the empirical study places the Pasar Gunung Tua slum area along a river boundary, with lingkungan units arranged around the watercourse (Harahap et al., 2024). This proximity to a river corridor is a common determinant of flood exposure in Indonesian slum settlements generally (Soma et al., 2022), yet neither the SK Bupati nor its lampiran includes a hazard overlay, floodplain boundary, or reference to the regency's disaster-risk map (Bupati Padang Lawas Utara, 2023). The decree's designation criteria, drawn from Peraturan Menteri Pekerjaan Umum technical guidelines on housing-quality improvement (Harahap et al., 2024), are environmental only in the narrow sense of building condition and infrastructure adequacy, not in the broader sense of hazard exposure.

This is a significant gap from a resilience-planning perspective: without an explicit spatial join between designated slum locations and hazard-prone zones in the regency's disaster-risk map, the prioritisation logic used to sequence the RP2KPKP action plan cannot account for differential disaster risk across the thirteen locations (UNDRR, 2015). Two locations of similar slum severity but different flood or fire exposure would, under the current instrument, be treated identically.


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**INSTITUTIONAL AND GOVERNANCE SHIFT**

The SK Bupati itself embodies periodic institutional recalibration: it explicitly revokes and replaces Keputusan Bupati Nomor 900/212/K/2018, indicating that slum designation is treated as a living instrument subject to renewed data collection and community involvement, as required under Pasal 98 ayat (2) Undang-Undang Nomor 1 Tahun 2011 (Republik Indonesia, 2011; Bupati Padang Lawas Utara, 2023). The decree also commits the regional government to pursue quality improvement in coordination with the provincial government of North Sumatra, positioning slum handling as a shared multi-level governance responsibility rather than a purely district-level administrative task (Bupati Padang Lawas Utara, 2023).

This existing pattern of institutional recalibration provides an opening for a governance shift: from a housing-quality governance model, in which the lead sector is public works and settlement (Dinas Perumahan dan Kawasan Permukiman), toward a multi-hazard resilience governance model that formally includes the regional disaster management agency (Badan Penanggulangan Bencana Daerah) in the designation and action-planning process (Republik Indonesia, 2007). Because the decree already anticipates periodic revision (Bupati Padang Lawas Utara, 2023), incorporating disaster-risk criteria at the next revision cycle would not require a new legal instrument, only an expanded evidentiary and coordination basis for the existing one.

**IMPLICATIOS FOR DISASTER RESILIENCE POLICY**

Three policy implications follow from the analysis. First, future revisions of the SK Bupati should add Undang-Undang Nomor 24 Tahun 2007 tentang Penanggulangan Bencana (Republik Indonesia, 2007) to the decree's legal basis and require that slum-location designation be cross-referenced against the regency's hazard and risk maps, so that prioritisation within the RP2KPKP reflects both slum severity and disaster exposure (UNDRR, 2015). Second, the technical standards used for physical-condition scoring (currently drawn from SNI 03-1733-2004 and Ditjen Perumahan Guideline No. 14/2018, per Harahap et al., 2024) should be supplemented with structural-safety criteria relevant to locally significant hazards — for example, fire-resistant wall and roof material standards in high-density wood-and-zinc settlements, and elevated-floor or drainage standards in river-adjacent locations. Third, socio-economic upgrading components of the RP2KPKP that targeting the same education, employment, and income variables shown to be statistically significant determinants of slum classification (Harahap et al., 2024) should be explicitly framed as resilience-building measures (expanding recovery capacity, per Bruneau et al., 2003) rather than as poverty-alleviation measures alone, since this framing affects which agencies



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and funding streams can be mobilised.

**IMPLICATIONS FOR SPATIAL PLANNING PRACTICE**

For spatial planning practice, the analysis suggests three concrete steps. First, the regency's Rencana Tata Ruang Wilayah (RTRW) should be synchronised with the SK Bupati's designated slum locations (Bupati Padang Lawas Utara, 2023) and with hazard maps, so that land-use zoning, slum designation, and disaster-risk zoning are read as a single overlay rather than three separate documents. Second, relocation or rusunawa (low-cost rental flat) programming, noted in the empirical study as a proposed, though contested, response to inadequate housing (Rachmawati et al., 2017, as cited in Harahap et al., 2024) should be prioritised for locations where slum severity and hazard exposure coincide, rather than applied uniformly across all thirteen designated locations regardless of relative risk. Third, the monitoring indicators used to track RP2KPKP progress should be expanded beyond housing-quality metrics (wall, roof, floor, window, density) to include resilience-relevant indicators such as evacuation-route accessibility, drainage adequacy, and access to clean water and sanitation (UNDRR, 2015), enabling the regency to report not only on housing improvement but on measurable resilience gain.

**DISCUSSION**

Taken together, the two documents examined in this study show that slum handling in Padang Lawas Utara currently functions primarily as a housing-quality and administrative instrument, grounded in sectoral settlement law and technical building-condition standards (Bupati Padang Lawas Utara, 2023; Republik Indonesia, 2011). The empirical evidence, however, demonstrates that the same locations designated as slum areas exhibit a compounded profile of physical fragility and low socio-economic adaptive capacity (Harahap et al., 2024) that conceptually satisfies the preconditions for elevated disaster vulnerability (UNDRR, 2015; Bruneau et al., 2003), even though this linkage is not yet operationalised in the regency's planning and legal documents.

This pattern is consistent with findings reported elsewhere in the slum literature cited by the empirical study itself, including research on livelihood-asset deprivation in Addis Ababa's informal settlements (Berhanu et al., 2022) and on the relationship between housing conditions and livelihood assets in Dhaka's urban slums (Soma et al., 2022), both of which identify the same coupling of housing inadequacy and constrained livelihood capacity found in Pasar Gunung Tua (Harahap et al., 2024). Comparable dynamics are reported in slum-upgrading contexts in Malawi


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and Ghana (Doe et al., 2020) and in residential-location-choice research in Lagos (Badmos et al., 2020). The Padang Lawas Utara case can therefore be read as a district-scale instance of a broader Global South pattern, in which slum-handling instruments designed under housing or settlement law are not yet explicitly integrated with disaster-risk-reduction frameworks (UNDRR, 2015), despite describing populations and locations that disaster-resilience theory would classify as highly vulnerable (Bruneau et al., 2003).

The study's principal limitation is its reliance on two documents (Bupati Padang Lawas Utara, 2023; Harahap et al., 2024) rather than primary hazard-occurrence records (flood, fire, or landslide incident data) for the designated locations, which would allow a more direct empirical test of the vulnerability–hazard linkage proposed here. The absence of a hazard overlay in the SK Bupati itself is, in this sense, both a finding of the study and a constraint on how far the argument can be extended without additional primary data.

## CONCLUSION

This study examined the extent to which slum conditions formally designated under Keputusan Bupati Padang Lawas Utara Nomor 181.1/23/K/2023 that covering 109.80 hectares across thirteen locations in five sub-districts (Bupati Padang Lawas Utara, 2023), constitute a form of disaster vulnerability, drawing on an independent empirical assessment of the regency's largest slum concentration in Pasar Gunung Tua Village (Harahap et al., 2024). The analysis finds that documented physical conditions (non-permanent construction, wood and zinc materials, high residential density) and socio-economic conditions (low income, informal employment, limited education) together produce a vulnerability profile consistent with recognised disaster-resilience indicators (UNDRR, 2015; Bruneau et al., 2003), yet this linkage remains unrecognised in the regency's current legal and planning instruments, which are framed exclusively under sectoral housing and settlement law (Republik Indonesia, 2011). Repositioning slum handling as an instrument of disaster resilience, through hazard-map integration, expanded technical standards, multi-sector governance, and resilience-framed socio-economic programming offers Padang Lawas Utara Regency a pathway to address slum conditions and disaster risk through a single, coordinated policy instrument rather than two disconnected ones.

## FUTURE DIRECTIONS

Future research should pursue at least four directions. First, primary hazard mapping should be overlaid onto the thirteen designated slum locations identified by Bupati Padang Lawas


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Utara (2023) to empirically test the spatial coincidence of slum severity and hazard exposure proposed in this study. Second, longitudinal evaluation of RP2KPKP implementation outcomes would clarify whether housing-quality improvement alone measurably reduces disaster vulnerability, or whether resilience gains require the additional socio-economic and institutional measures proposed here (Bruneau et al., 2003). Third, comparative document analysis across neighbouring regencies in North Sumatra would indicate whether the sectoral silo identified in this study is a localised or a systemic feature of Indonesian slum-handling policy. Fourth, future work could develop and test a composite resilience index for designated slum locations, combining physical, socio-economic, spatial, and institutional indicators of the kind synthesised in Table 2 (drawing on Harahap et al., 2024, and UNDRR, 2015), to provide regency governments with a monitoring tool that captures resilience outcomes alongside conventional housing-quality metrics.

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