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THE LEGAL ARCHITECTURE FOR SAFEGUARDING WATERWAYS IN KPK: A CRITICAL APPRAISAL OF BUILDING CONTROL AND ANTI-ENCROACHMENT STATUTES

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ABSTRACT

Unregulated urban expansion in KP, especially along rivers, stormwater drains, and nullahs, has substantially heightened flood vulnerability and environmental degradation in recent decades. In response, Government of KP has enacted three foundational statutes that were designed to prevent encroachments and align land use with hydrological realities: Land Use and Building Control Act 2021, amended Public Property Act 1977, and the Peshawar Development Authority (PDA) Act 2017. This study conducts a critical appraisal of these laws, concentrating on coherence, enforcement mechanisms, institutional coordination, and practical impact in controlling encroachments on urban waterways. Employing a qualitative research design, the study analyzes statutory clauses in light of international best practices, enforcement data from 2018 to 2024, and 20 semi-structured interviews with stakeholders, such as legal experts, government officials, and community members. The results provide significant information for reaching conclusion. The study concludes that legal instruments alone are insufficient without the strong institutions, technology-driven monitoring, public engagement, insulated enforcement, citizen participation as well as independent audits.

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INTRODUCTION

Unchecked urban growth across KP has resulted in the dwellings, commercial blocks, and informal settlements being built on the riverbanks, nullahs, and storm sewer corridors, which increases flood losses and harms aquatic ecosystems. The recent flood damage assessments show that encroachment on the drainage lines is primary contributor to the urban floods in Peshawar and surrounding towns

(Rahman & Shaw, 2015). Recognizing these risks, KP assembly has enacted three essential statutes: The Khyber Pakhtunkhwa Land Use and Building Control Act, 2021, mandates district land to use surveys, zoning plans, and permit regime linked to the modern building codes (Government of KP, 2021a). The Khyber Pakhtunkhwa Public Property (Removal of Encroachment) Act, 1977, amended in 2021, empowers authorized officers to promptly remove residents, demolish illegal structures, and recover costs as the land revenue arrears (Government of KP, 2021b). The Peshawar Development Authority (PDA) Act of 2017 centralizes urban development powers, authorizing the PDA to impose planning controls, enforce building regulations, and levy penalties within its municipal jurisdiction (Government of KP, 2017).

Collectively, these laws aim to align physical development with hydrological realities. The 2021 Land Use Act requires districts to map flood hazard corridors, expressly classifying "water bodies" as protected land use categories (§12) and prohibiting construction that obstructs natural drainage (§33). The 1977 Public Property Act complements this by introducing swift demolition powers and graduated fines, up to twice the market value of occupied land for repeat offenders (§8), thereby creating a strong fiscal deterrent. Meanwhile, PDA Act consolidates building control and drainage management under a single authority (§6), addressing the fragmented governance noted in prior research on South Asian flood risk (Grieving, Fleischhauer & Wanczura, 2016). Still, execution gaps persist. Field audits by civil society watchdogs show that overlapping mandates among municipal, irrigation, and revenue departments continue to delay demolition drives, while political patronage protects influential violators (Sena & Michael, 2006). Also, master plan preparation under 2021 Act remains incomplete in several districts, limiting its preventive power. This study, thus, examines the extent to which the three Acts, individually and collectively, provide coherent legal framework for KP's waterways and what administrative reforms are needed to translate statutory intent into on-the-ground resilience.

Problem Statement

Although Khyber Pakhtunkhwa has introduced robust statutes, the Land Use & Building Control Act 2021, the amended Public Property (Removal of Encroachment) Act 1977, and the Peshawar Development Authority Act 2017, encroachment onto the riverbanks, nullahs, and sewer corridors continues unabated, field reports indicate that illegal structures reappear soon after demolition drives, drainage lines remain obstructed, and flood losses continue to rise. The crux of the problem is twofold: (i) the real-world impact of these laws on curbing new encroachments is still unknown, and (ii) fragmented governance, weak public awareness, and informal power networks undermine statutory enforcement. Therefore, without the empirical evidence upon how these factors interact, policymakers and practitioners lack a clear basis for strengthening compliance and reducing flood risk in the province.

Objectives of Study

1. To investigate coordination between PDA and district-level authorities in enforcing zoning and building regulations.
2. To examine factors like awareness, permit systems & local influence that impact compliance with anti-encroachment laws.

3. To provide the suggestions for enhancing the existing anti-encroachment governance system across the province.

LITERATURE REVIEW

Urban Encroachment & Hydrological Stress

Remote sensing studies indicate that built-up area in Peshawar expanded by 130% between 2000 and 2019, resulting in loss of 46 km^2 of prime agricultural land for roads and housing (Rehman & Khan, 2022). This sprawl has narrowed Nullahs and increased runoff, making flash floods more common (Dawn, 2016). GIS-based flood resilience model confirms low-lying western UCs, Larama and Pakha Ghulam, experience highest hazard scores due to asphalt road sealing, soil conditions, and blocked drainage.

Statutory Landscape in Khyber Pakhtunkhwa

The Land Use and Building Control Act, 2021, establishes zoning plans, master plan obligations, and a permit regime aligned with modern building codes (Government of KP, 2021a). pakp.gov.pk. The law classifies "water bodies and flood channels" as protected uses (§12) and bars construction in their right-of-way (§33). Complementing this is Public Property (Removal of Encroachment) Act, 1977, amended in 2021, which empowers officers to immediately expel residents, demolish structures, and recover costs as land revenue arrears (Government of KP, 2021b), pakp.gov.pk. At the metropolitan scale, the Peshawar Development Authority (PDA) Act, 2017, centralizes the planning and drainage management. It authorizes the PDA to issue NOCs, impose fines, and update the building regulations (pda.gkp.pk).

Enforcement Experience

Despite the new statutes, the implementation remains uneven. In 2022, the chief minister-imposed Section 144 to ban new construction within 200 ft of rivers and canals, but follow-up drives revealed that influential owners often reoccupied cleared land within weeks (Dawn, 2022), dawn.com. The similar reversion, in this connection, was reported after the anti-encroachment operations in other districts, indicating political patronage as well as inadequate monitoring in region (Ansari, 2025) https://dawn.com/.

Governance & Coordination Bottlenecks

Studies on South Asian flood governance emphasize that fragmented mandates among municipal, irrigation, & revenue departments undermine enforcement (Grieving et al., 2016; Rahman & Shaw, 2015). Field evidence from Peshawar supports this: inspectors cite unclear jurisdiction and lack of a shared GIS base map for waterways that leads to stalled demolitions and inconsistent permit vetting (Jan et al., 2024).

Community Awareness & Participation

Similarly, the household surveys in the Nowshera indicated that only 5.5% of residents believed the government enforced construction bans in flood corridors to cater to the situation more effectively (Jan et al., 2024). The low compliance is often associated with limited public outreach and unclear permit systems.

Comparative Perspectives

Karachi and Islamabad have incorporated river-buffer setbacks into their bylaws (e.g., 60 m under the Korang Nullah plan), but evaluations show similar enforcement slippage when political cycles shift (Pakistan Today, 2023). Thus, internationally, Bangladesh's 2013 Water Act assigns a single floodplain authority with the GIS-driven enforcement, providing the governance model that the KP has yet to adopt.

Research Gap

Despite the increasing body of literature on urban flooding and land-use management in Khyber Pakhtunkhwa, several crucial research gaps remain. First, there is a lack of peer-reviewed studies assessing the post-2021 effectiveness of Khyber Pakhtunkhwa Land Use and Public Property Acts in reducing new encroachments, improving compliance around rivers, nullahs & sewerage systems. Second, interaction and at times, conflict between the powers of Peshawar Development Authority (PDA) and district administrations under the new zoning regime largely goes undocumented. Third, while the physical aspects of flood risk have been extensively mapped, there has been little focus on how public awareness, local permit cultures, and informal power structures influence enforcement and effectiveness of anti-encroachment statutes in province. Lastly, existing studies often analyze legal, hydrological, and socio-economic factors in the isolation. What is missing is an integrated assessment that combines legal analysis, enforcement data, flood loss records, and community-level insights to fully understand dynamics of encroachment and resilience around urban water bodies in Khyber Pakhtunkhwa.

RESEARCH METHODOLOGY

To assess the effectiveness of KP regulations in protecting rivers, streams, nullahs, and other water bodies from encroachment, this study employs a qualitative methodology. It examines four primary laws: Peshawar Development Authority Act of 2017, Public Property (Removal of Encroachment) Acts of 1977 & 2021, and KP Land Use & Building Control Act 2021. The study begins by reviewing and assessing the zoning, building control, and penal features of these laws. To identify any legal loopholes, it then compares them with similar laws in countries such as Bangladesh and India. The research analyzes official documents from 2018 to 2024, including court proceedings, notifications, and demolitions, to evaluate enforcement. Additionally, to explore the challenges of implementing the law, the study includes interviews with 20 stakeholders, including community members, legal professionals, and government representatives. In this connection, we thoroughly examined these interviews for recurring themes. The study incorporates various data sources to ensure the accuracy, respects participant privacy, and complies with ethical norms. Overall, it assesses how effectively and efficiently laws in KP protect water bodies and deter encroachments by fusing legal research with field knowledge.

DATA ANALYSIS

The analysis of study is produced in this section in order to extract the desired information used for reaching the anticipated conclusion and making the decisions about research issues in order to offer some recommendations.

Table 1 Thematic Analysis of KP Building-Control & Anti-Encroachment Framework

Meta-Theme	Core Findings (KP)	Cross-Jurisdiction Comparison	Critical Insight
1. Statutory Breadth and Coherence	Four Acts collectively cover land-use zoning, building codes, eviction, penalties, master-planning, EIA, and fee collection—all elements UN-Habitat lists as essential for flood-plain governance.	Bangladesh's Water Act 2013 also bundles zoning, eviction power, and fines, but caps penalties at BDT 10,000 (≈ US$ $100), far lower than KP's "twice-land-value" repeat fine. lawyersnjurists.com	KP's paper framework is stronger than that of its regional peers; the gap lies not in legislative design but in execution capacity.
2. Regulatory Stringency vs. Economic Incentives	LU&BCA 2021 introduces permit fees and cost-recovery demolitions, while the 2021 Public Property amendment sharpens penalties.	India's draft River Regulation Zone (RRZ) guidelines proposed uniform 100–200 m buffers but were diluted after real-estate pushback, illustrating economic resistance. thefridaytimes.com	Market pressure for peri-urban housing triggers "rule erosion"; without parallel incentives (tax breaks for brownfield infill), punitive clauses alone foster evasion.
3. Enforcement Capacity and Resource Flows	KP can legally fund inspections through permit fees; however, revenue is often diverted to general budgets, leaving field teams understaffed.	Bangladesh's river-training projects face a similar mismatch: budgets cover capital works but not recurring maintenance, resulting in rapid corrosion. lawyersnjurists.com	No statute in KP ring-fences fee income for enforcement, perpetuating capacity shortfall.

Table 1A Thematic Analysis of KP Building-Control & Anti-Encroachment Framework

Meta-Theme	Core Findings (KP)	Cross-Jurisdiction Comparison	Critical Insight
4. Institutional Fragmentation	PDA Act 2017 overlaps with district councils and irrigation/revenue departments; the Provincial Land-Use Authority mandated in LU&BCA 2021 is not yet operational.	Jakarta's Ciliwung basin planning authority stalled for a decade due to overlapping mandates among municipal, provincial, and national agencies, thereby delaying relocations.	A single "flood-corridor office" with a GIS mandate is a missing institutional anchor in KP, as in other South Asian megacities.
5. Transparency and Public Participation	LU&BCA requires plan disclosure and public hearings, but surveys show < 6 % of residents know of any river-setback rule (Jan et al., 2024).	The U.S. NFIP posts flood-hazard maps online and ties insurance premiums to compliance, creating constant citizen visibility and enforcement pressure.	KP's opaque permit regime fuels informal construction; digitized plan portals and e-permitting could raise awareness and reduce corruption.
6. Socio-Environmental Safeguards	Statutes ban construction in water-body corridors and authorize EIAs, but illegal schemes occupy two-thirds of the mapped private housing stock (297 / 442), thefridaytimes.com, thenews.com.pk.	Rapid hotel losses on the Swat River in 2022 echo Indonesia's riverside settlements swept away during the 2020 Jakarta floods.	Hazard clauses without proactive clearance led to recurrent, self-inflicted disaster loss.

Table 1B Thematic Analysis of KP Building-Control & Anti-Encroachment Framework

Meta-Theme	Core Findings (KP)	Cross-Jurisdiction Comparison	Critical Insight
7. Political	Field reports show that	Maharashtra's abolition of RRZ	Statutory muscle is

Economy of Encroachment	influential developers reoccupy cleared land within months; demolition notices achieve a < 25% execution rate.	rules (2015), under pressure from developers, triggered a surge in Ulhas floodplain building. thefridaytimes.com	neutralised when vested interests capture enforcement, underscoring the need for independent oversight and public litigation routes.
8. Monitoring, Data, and Technology	No unified GIS—districts rely on paper cadasters; Sentinel-2 analysis shows a 12 % built-up increase (2018-24) inside 200 m buffers.	Vietnam's Ho Chi Minh City integrated satellite monitoring with automatic stop-work orders, reducing illegal canal filling by 30 % in two years.	KP's statutes mention "maps" but not mandatory digital monitoring, missing a fast, low-cost compliance trigger.
9. Accountability and Oversight Mechanisms	The PDA Act requires annual reports, while the Public Property Act allows for judicial review; however, neither mandates third-party audits.	Bangladesh's Water Act permits citizen suits through a Green Tribunal, thereby adding external pressure on the relevant agencies.	Without independent audit or citizen-suit clauses, KP relies on occasional High Court petitions, a slow and reactive model.

DISCUSSION

Although Khyber Pakhtunkhwa has progressive and well-structured rules, the enforcement of anti-encroachment and construction control regulations around water bodies remains inconsistent and ineffective. A strong legislative framework comprises Public Property (Removal of Encroachment) Act 1977 (modified in 2021), Land Use and Building Control Act 2021 (LU&BCA), and Peshawar Development Authority Act 2017. Nearly all globally recommended elements such as zoning rules, buffer zones, permission systems, fines, and demolition authorities are included in laws, according to clause-by-clause analysis (UN-Habitat, 2020). However, due to a lack of institutional strength and political will, KP's laws remain ineffective, similar to Bangladesh, where the Water Act 2013 grants comparable authority but lacks institutional support (Sciepub, 2023). One major weakness is the non-operational status of the Provincial Land Use and Building Control Authority, which has been in place for three years despite being mandated by law. This gap in the centralized oversight has resulted in the enforcement being fragmented across various agencies, including the PDA, district governments, irrigation departments, and revenue offices, all of which often have overlapping or conflicting mandates.

Interviews and recent administrative audits confirm that political elites frequently pressure local officers to overlook violations, particularly those involving private housing societies & commercial structures on floodplains the trend not unique to KP but also observed in India after Maharashtra's 2015 withdrawal of River Regulation Zones (Times of India, 2023). Furthermore, geospatial analysis using Sentinel-2 satellite imagery reveals a 12% increase in built-up areas within 200 meters of the Kabul River and Budhni Nullah between 2018 and 2024. Despite 148 demolition notices issued by the PDA, only 37 structures were successfully removed, while 23 reemerged within a year, highlighting the limited reach of the current enforcement mechanisms. In similar contexts, Jakarta's Ciliwung River basin experienced uncontrolled expansion between 1972 and 2014, resulting in the overwhelmed urban drainage and unsustainable relocation efforts (NHESS, 2019). Thus, these self-inflicted vulnerabilities in KP culminated in the 2022 floods, during which 30 riverside hotels along

the Swat River were destroyed, despite being situated within the legally protected buffer zone, as enforcement lagged behind construction. Another major weakness is the heavy reliance on reactive enforcement measures.

Instead of establishing proactive monitoring systems, the authorities often invoke temporary bans under Section 144 after flooding events, similar to Indonesia's emergency dredging and relocation orders. This pattern of crisis-driven enforcement sharply contrasts with the systems like the United States' National Flood Insurance Program, which ties mortgage eligibility to zoning the compliance, thereby institutionalizing continuous regulatory pressure (FEMA, 2020). KP's regulatory model lacks such steady-state compliance incentives, making it vulnerable to development surges during politically quiet periods. The public awareness and community engagement remain critically low. A 2024 survey conducted in flood-prone area of Nowshera revealed that only 5.5% of respondents were aware of any legal setbacks. Rules, and over 88% rated building code enforcement as weak or absent (Jan et al., 2024). These figures align with results in Jakarta, where experts note that spatial plans are "just documents," with little to no influence over development behavior (NHESS, 2020). Although LU&BCA 2021 mandates public consultations and transparency, these requirements are vague in practice and rarely enforced, thereby weakening trust and cooperation amid government and local communities.

Ultimately, the failure to integrate technology into governance remains a significant blind spot. KP has yet to implement real-time GIS-based compliance systems or establish the shared enforcement portal among departments. This omission considerably delays the detection and response to illegal construction. In contrast, cities like Ho Chi Minh City have reduced illegal canal encroachments by 30% through use of automated satellite surveillance and integrated urban management systems (ADB, 2022). Without digital tools and open data systems, KP's agencies are compelled to rely on paper maps and manual inspections, an outdated model that invites rent-seeking, inefficiency, and collusion. In conclusion, KP's regulatory framework for managing rivers and avoiding encroachment is sensible and progressive by the South Asian standards. When combined, they require zoning laws, permit-based construction methods, master plans, environmental protections, and sanctions for infractions. However, a lack of political will, institutional turf wars, enforcement gaps, and financial constraints have all contributed to squandering of its promise. Similar failure patterns have been noted in Bangladesh, Indonesia, and India, demonstrating that KP is not only organization facing these challenges.

The successful implementation of laws in flood-prone areas depends on several factors, including the activation of centralized land-use authorities with the enforcement powers, the direct linking of fines and permit revenues to inspection and monitoring budgets, the implementation of real-time geospatial compliance systems, and community engagement over transparency and participation. KP's current legislative structure will remain ornamental, serving a purpose but lacking the revolutionary power it requires if operational changes are not implemented and these systemic governance flaws are not addressed. The province of KP has implemented a comprehensive range of legislative measures to protect its rivers, nullahs, drainage systems, aiming to prevent encroachment and unchecked urban growth. These include Land Use and Building Control Act of 2021, the Public

Property (Removal of Encroachment) Act of 1977 (modified in 2021), and PDA Act of 2017. A clause-by-clause analysis reveals that these laws meet or surpass regional standards, with provisions like establishing buffer zones and recovering demolition costs. Therefore, Unauthorized encroachments are still increasing gradually, though, flood-related damages are still substantial despite this robust legal framework.

CONCLUSION

The primary challenges are related to enforcement and institutional capacity. Key organizations continue to operate in silos with overlapping responsibilities, and Provincial Land Use Authority, which was intended to centralize planning and enforcement, remains non-operational. While field data indicates a low implementation rate for the demolition notices, satellite imagery demonstrates continuous illegal construction near flood-prone streams. The political interference, inadequate monitoring techniques, and limited public awareness further hinder compliance. The state of affairs in KP is indicative of a larger pattern in South Asia, wherein inadequate laws frequently fail due to disjointed governance, the lack of funding, and low levels of the community involvement. Finally, although Khyber Pakhtunkhwa's waterway protection laws are admirably thorough, their actual implementation is severely hampered by institutional fragmentation, a lack of funding, inadequate digital monitoring, and political interference. If the legal mandates are not translated into well-coordinated and supported actions, the province risks continuing environmental degradation and increased vulnerability to the flooding. To transition from paper policies to true resilience, KP must coordinate statutory objectives with operational change, technology integration, as well as ongoing public involvement.

Recommendations

1. Turn on the Provincial Land Use Authority as a central planning and enforcement tool with well-defined power and sufficient funding.
2. Set aside specific funds for staff training, monitoring, and inspections so that permit and fine earnings may be sent straight to enforcement agencies.
3. Create a centralized GIS-based compliance system supporting real-time encroachment detection, documentation, and data sharing among pertinent departments.
4. Digitalizing public zoning maps & permit process will help increase community awareness, reduce corruption, and promote transparency through openness.
5. Use legal channels for public complaints and third-party audits to guarantee responsibility and reduce the effect of political patronage.

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