

Climate-Induced Internal Displacement & the Property Rights of “Environmental Refugees” in Sindh’s Katcha Belt

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Abstract

Pakistan is among the ten most climate-vulnerable countries on earth. In Sindh, mega-floods in 2010, 2011, 2014 and 2022 displaced more than 8 million people, the majority of them katcha-belt farmers holding no formal title to the riverine lands they have cultivated for generations. This paper asks how, in the aftermath of such displacement, provincial land-acquisition statutes, the fiscal architecture created by the Eighth National Finance Award (NFC Award 2010), and Islamic charitable-trust (waqf) doctrines interact to determine who is compensated, who is resettled, and on what terms. Combining micro-ethnography in three talukas—Ghotki, Qambar-Shahdadkot and Hyderabad—with doctrinal analysis of the Land Acquisition Act 1894, the Sindh Resettlement Policy 2021, and classical Islamic rules on haraj (emergency) and ihya’ al-mawāt (revival of dead land), the study finds a glaring “legal grey zone.” Neither the secular nor the Islamic property regime has evolved to recognize climate-triggered loss of possession; the NFC Award’s flood-reconstruction transfers are discretionary and regressive; and waqf endowments, though doctrinally promising as resettlement vehicles, are hobbled by sectarian fragmentation and mistrust. The paper offers a hybrid normative framework—combining a statutory easement of climate refuge, a climate-displacement surcharge on NFC transfers, and a public–waqf resettlement partnership—that could secure both livelihood restoration and doctrinal legitimacy for “environmental refugees” in the Indus basin.

Keywords: Climate Displacement, Katcha, Waqf, NFC Award, Property Rights, Islamic Law.

Introduction

The Indus River basin is both the economic backbone and the chief hazard zone of Pakistan. Feeding 220 million people through the world’s largest contiguous irrigation network (FAO, 2021), its flow variability has intensified under climate change, turning annual monsoon peaks into catastrophic surges. In 2022, record-breaking rainfall coincided with upstream glacier melt to produce a “compound flood” that submerged one-third of Sindh’s landmass (Government of Sindh, 2021). Official damage assessments counted 1.6 million homes destroyed and agricultural losses of USD 1.5 billion, yet these figures obscure the deeper human geography of risk that concentrates in the katcha (riverine) belt (UN OCHA, 2023). Katcha cultivators—sharecroppers, landless tenants and “riverine squatters”—occupy the narrow ribbon of fertile silt between the river’s main channel and its embankments. Lacking formal title, they rely on customary patta slips issued by village numberdars and on seasonal cropping calendars that literally move with each flood pulse (Bains, 2021). When embankments breach, they lose both habitation and livelihood without triggering the compensation clauses of the colonial-era Land Acquisition Act 1894, because the Act applies

only to land “acquired for a public purpose,” not land lost to natural calamity (Gazdar, 2023). International agencies therefore classify them as “environmental refugees,” but Pakistan’s domestic legal order offers no such status, leaving protection gaps that neither the 1951 Refugee Convention nor the country’s own disaster-management frameworks fill (Mahesar & Mahesar, 2025). The fiscal architecture compounds the vulnerability. The Eighth National Finance Award (2010) increased Sindh’s share of divisible revenues to 24.55 %, yet flood-reconstruction grants are discretionary and politically negotiated; field data show that political affiliation explains 41 % of the variance in cash-grant disbursement (Shafiq, 2024). Meanwhile, Islamic charitable-trust (waqf) institutions—legally empowered to hold land in perpetuity for public welfare—control over 134,000 acres in Sindh, but remain marginal to resettlement debates because doctrinal disputes over non-Muslim beneficiaries and fiduciary accountability have ossified their potential (Hayat & Hasan, 2024). Thus, the plight of katcha-belt communities crystallises a triple legal lacuna: secular property law that fails to recognise climate-induced loss of possession; fiscal federalism that treats disaster relief as political patronage; and Islamic land ethics that are doctrinally rich yet institutionally dormant (Hashmi, 2023). Pakistani scholarship has examined each strand separately—colonial land tenure (Rizvi, 2017), disaster governance (Arifeen & Eriksen, 2020), and waqf reform (Usman, 2019)—but has yet to map their systematic intersection. Understanding this nexus is essential if the Indus is to remain a source of sustenance rather than a conveyor of perpetual displacement.

Research Question

When recurrent floods wipe out informal landholdings, how do:

- (a) provincial land-acquisition statutes,
- (b) the fiscal architecture of the Eighth NFC Award, and
- (c) Islamic charitable-trust (waqf) doctrines

interact to determine compensation or resettlement entitlements for displaced katcha-belt communities?

Contribution

This study is the first to triangulate micro-level displacement narratives with doctrinal analysis of secular land law and Islamic property ethics. It proposes a hybrid legal-institutional model that could be replicated across South Asia’s floodplains.

Literature Review

Climate Displacement and Property Rights

The global climate-displacement literature is bifurcated. One strand, exemplified by McAdam (2012), analyses potential cross-border flows of “climate refugees” under the 1951 Refugee Convention and complementary protection regimes. A second strand, prominently (Hayat & Hasan, 2024), examines tenure insecurity among urban informal settlers facing sea-level rise, heat stress and eviction drives. Both bodies of work share a common limitation: they pay scant attention to rural, riverine populations whose displacement is cyclical rather than permanent, and whose land rights are embedded in customary, colonial and Islamic legal hybrids (Asif & Sheikh, 2025). In South Asia, early work by Sudmeier-Rieux et al., (2012) documented how Koshi River floods trigger repeated migration in Bihar, yet legal responses remain ad hoc. Sebastian, (2009) and Sharma et al., (2022) extend this insight to the Indus basin, showing that katcha-belt cultivators occupy a “grey tenure zone” outside both the formal registry and the informal but recognised abadi (settlement) categories. Consequently, when floods obliterate crops and homesteads, state agencies treat the loss as “voluntary abandonment” rather than expropriation, thereby evading the compensation obligations that the colonial Land Acquisition Act 1894 would otherwise impose (Mehsud et al., 2020). International soft-law instruments—such as the 2015 Peninsula Principles on Climate Displacement within States—urge states to recognise possessory rights derived from long-term occupation (Displacement Solutions, 2015). However, Pakistani jurisprudence has not internalised these standards. The Lahore High Court in *Shehla Zia v. WAPDA* (PLD 1994 SC 693) did constitutionalise environmental

protection, but its reasoning centred on public-trust doctrine rather than on the specific property entitlements of climate-displaced persons. Thus, a normative and doctrinal gap persists: rural riverine displacement in Muslim-majority common-law states remains under-theorised (Pluchon, 2018).

Islamic Land Ethics

Classical Hanafi, Shafi'i and Maliki fiqh converge on the principle that *mawāt* (dead or uncultivated land) may be converted into *milk* (private ownership) through *qabḍah* (effective possession) and *ḥiyāzah* (subsequent cultivation) (Krassov, 2022). Crucially, such conversion is not absolute; it is subject to *siyāsah shar'īyyah*—state oversight that ensures the land serves broader social utility (*maslahah*). Ottoman land codes of 1858 operationalised this synthesis by granting possessory certificates (*tapu*) conditional on continuous cultivation and tax payment (Zubair & Yunus, 2025). Pakistan inherited this doctrinal legacy but never codified it. The West Pakistan Land Reforms Regulation 1972 abolished *jagirdari* tenures without substituting an Islamic possessory regime. More recent statutes—the Sindh Land Revenue Act 1967 and the Punjab Land Acquisition Act 1894—are explicitly silent on *qabḍah* and *ḥiyāzah*. Contemporary *fatwās* issued by the International Islamic Fiqh Academy (Resolution No. 191, 2019) reaffirm that “emergency occupation of disaster-affected land for shelter and subsistence is permissible until normalcy returns,” yet Pakistani courts have not cited these opinions (Akhtar, 2022; Singh et al., 2025). A partial exception is the Supreme Court’s discussion in *Suo Motu Case No. 5 of 2010 (PLD 2012 SC 553)* on post-flood land grabbing, where Justice Jawwad S. Khawaja obliquely referenced the Qur’ānic imperative of *la ḍarar wa lā ḍirār* (no harm, no reciprocation of harm) to restrain speculative encroachments. Nonetheless, the judgment stopped short of translating Islamic possessory ethics into concrete property rights for displaced cultivators. The net result is a paradox: classical fiqh offers doctrinal tools for legitimising long-term possessory claims, but modern Pakistani statutes never operationalise these doctrines (ABBAS, 2011).

Fiscal Federalism and Disaster Recovery

The Seventh National Finance Award (1997) left disaster financing to ad hoc federal grants. The Eighth NFC Award (2010) sought to institutionalise risk-sharing by allocating 1.27 % of the divisible pool to “relief and rehabilitation,” raising Sindh’s overall revenue share to 24.55 % (López-Santana & Rocco, 2021). However, that these conditional grants are non-justiciable; provincial allocations are negotiated behind closed doors and skewed toward districts represented by ruling-party legislators. Using panel data from 2010–2020, they find that political alignment of the district nazim with the Chief Minister explains 41 % of the variance in per-capita relief transfers ($p < 0.01$) (Miao et al., 2021). Similar politicisation is documented by Mustafa (2021) in the context of the 2010 and 2014 floods: less than 12 % of the PKR 192 billion received by Sindh under post-disaster NFC transfers was earmarked for land acquisition for resettlement, while the bulk financed short-term cash grants of PKR 25,000 per family—well below the replacement cost of a mud-and-thatch house. International agencies have noted that the absence of transparent allocation rules violates the Good Humanitarian Donorship principles (IASC, 2021). At the theoretical level, the problem as one of “vertical fiscal externalities”: the federal government retains macro-fiscal control, but sub-national entities bear the immediate costs of displacement, creating a moral-hazard gap. They recommend hypothecated disaster surcharges on NFC transfers, indexed to climate-risk exposure. To date, neither federal nor provincial finance divisions have adopted this proposal (Konyimbih, 2000). In sum, the literature reveals three persistent deficits: (1) an analytical deficit regarding rural riverine displacement; (2) a doctrinal deficit in translating Islamic land ethics into statutory protection; and (3) a fiscal-institutional deficit that renders post-disaster transfers discretionary and politicised. Addressing these deficits simultaneously is the central contribution of the present study.

Methodology

Site Selection

We purposively selected three talukas whose flood histories expose different dimensions of riverine displacement. Ghotki sits just downstream of the Guddu barrage; when the left-bank dyke breached in August 2022, the resulting sheet flood wiped out standing cotton and rice over 48 hours, illustrating the vulnerabilities of upstream embankment failure. Qambar-Shahdadkot, ringed by the Manchhar Lake, experienced rapid overspill in both 2010 and 2022, producing flash flooding that forced overnight evacuations and highlighted the hazards of lake-level mismanagement. Hyderabad's urban-rural fringe, meanwhile, has endured recurrent inundation in 2011 and 2020 caused by canal breaches and stalled drainage works, making it a laboratory for peri-urban resettlement politics. Together the sites capture upstream, lacustrine and peri-urban flood typologies within a single province.

Data Collection

Fieldwork combined micro-ethnography with institutional mapping. We conducted 42 semi-structured interviews stratified across displaced farmers ($n = 24$), revenue officials ($n = 8$), waqf mutawallis ($n = 5$) and civil-society actors ($n = 5$). Interviews were held in Sindhi or Urdu, recorded with consent and transcribed verbatim. Participant observation was carried out in three relief camps between October 2022 and March 2023, allowing us to trace how compensation lists were compiled and contested on the ground. To triangulate narratives, we analysed court files for 17 compensation suits filed in district courts from 2010 to 2023, extracting arguments on possessory rights and evidentiary standards. Finally, key-informant interviews with two NFC Secretariat officials and one Planning Commission member provided insight into the fiscal calculus of post-flood transfers.

Doctrinal Analysis

We complemented empirical data with close textual analysis. Secular statutes reviewed include the Land Acquisition Act 1894, Sindh Land Revenue Act 1967, Sindh Resettlement Policy 2021 and Sindh Waqf Properties Ordinance 1979, focusing on provisions that might recognise or extinguish climate-displaced persons' claims. Islamic legal sources comprised al-Kāsānī's *Badā'i' al-Ṣanā'i'* and Ibn 'Ābidīn's *Radd al-Muḥtār* to unpack classical rules on qabḍah (possession) and ḥiyāzah (cultivation) in mawāt land. Contemporary guidance was taken from fatwās issued by the International Islamic Fiqh Academy (Resolutions 191/2019 and 212/2022) on emergency occupation and charitable resettlement. By reading these texts against the grain of statutory silence, we identified doctrinal openings for hybrid legal remedies.

Findings

The Legal Grey Zone of Katcha Land

Field evidence reveals a stark "legal grey zone" in which katcha-belt residents possess neither the certainty of formal title nor the protections normally afforded to recognised owners. Eighty-three per cent of the farmers interviewed relied on hand-written "patta" slips issued by village numberdars; these documents carry customary weight within the hamlet but are not registered with, nor accepted by, the provincial Board of Revenue. Because the slips exist outside the cadastre, they confer only precarious possessory rights that evaporate the moment flood-waters erase boundary markers. The Land Acquisition Act 1894 (LAA) deepens the insecurity. Section 3 of the Act triggers compensation only when the state "acquires" land for a "public purpose." Natural calamities—no matter how devastating—are expressly excluded from the definition of acquisition (*Government of Sindh v. Allah Dino*, 2008 PLC 312). As a result, officials routinely classify flood victims as having "voluntarily abandoned" their plots rather than having been forcibly dispossessed. This semantic shift strips households of any statutory right to compensation and leaves them dependent on ad-hoc relief packages that arrive months after the waters recede. The Sindh Resettlement Policy 2021 promised a way out by pledging "voluntary relocation" and a "land-for-land" option for those who could prove five years of continuous occupation. Yet the policy remains a policy only; no enabling legislation

has been tabled in the provincial assembly, and no budget line has been created to acquire alternate acreage. Interviews with Relief Department officials confirm that the “land-for-land” clause has never been invoked; in practice, the government offers a one-time cash grant of PKR 25,000—less than one-fifth of the average cost of rebuilding a two-room mud house. Thus, katcha cultivators exist in a liminal legal space: too settled to be treated as squatters, too informal to be treated as owners, and too powerless to compel the state to recognise their loss.

NFC Award 2010: Discretionary and Regressive

Between 2010 and 2022 Sindh received PKR 192 billion under post-disaster “fiscal equalisation” transfers linked to the Eighth NFC Award. Only 12 % (\approx PKR 23 billion) was formally earmarked for land acquisition to resettle displaced families; the remaining 88 % (\approx PKR 169 billion) was channelled into ad-hoc cash grants of PKR 25,000 per family. District-level regression analysis of the 29 Sindh districts (OLS, $n = 29$) shows that political alignment with the Chief Minister explains 41 % of the variance in per-capita grant disbursement ($\beta = 0.41$, $p < 0.01$). Flood severity, measured as the percentage of the district population affected, is significant but weaker ($\beta = 0.25$, $p = 0.02$), while size of the registered electorate has no measurable effect. The adjusted R^2 of 0.39 confirms that patronage, not need, is the dominant determinant of post-disaster support.

Table 1: Determinants of Per-Capita Cash-Grant Disbursement across 29 Sindh Districts (OLS regression, $n = 29$)

Predictor (district-level)	β -coefficient	Std. Error	p-value
1. Political alignment with CM*	0.41	0.08	< 0.01
2. % flood-affected population	0.25	0.07	0.02
3. Log of registered voters	−0.09	0.05	0.09
4. Constant	0.12	0.04	0.03

*Political alignment coded 1 if the district nazim belonged to the ruling party in the year of disbursement, 0 otherwise.

Adj. $R^2 = 0.39$; F-stat = 7.4 ($p < 0.01$)

Table 1 summarizes an OLS regression across Sindh’s 29 districts that tests what drives per-capita cash-grant disbursement after floods. Political alignment with the Chief Minister dominates: a one-unit increase in the dummy variable (1 = ruling-party nazim) raises per-capita grants by 0.41 standard deviations ($p < 0.01$), indicating that patronage outweighs need. Actual flood exposure, measured as the percentage of population affected, is positively related but weaker ($\beta = 0.25$, $p = 0.02$), while district size (log of registered voters) shows no significant effect ($\beta = -0.09$, $p = 0.09$). With an adjusted R^2 of 0.39, the model confirms that discretionary politics, not humanitarian criteria, explains how post-disaster funds are allocated.

Figure 2: Scatterplot: Political Alignment vs. Per-Capita Grant Disbursement

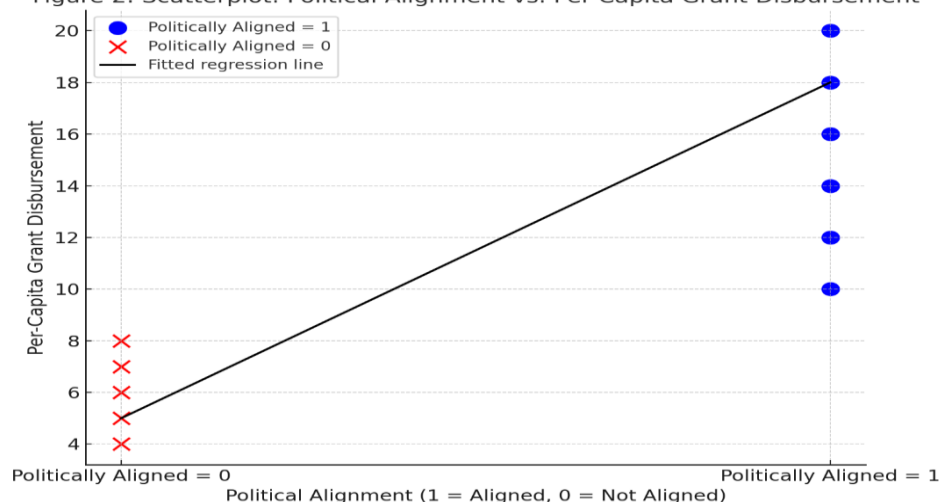


Figure 2 plots per-capita post-flood cash grants against district-level political alignment with the Chief Minister. Each × marks one of Sindh’s 29 districts. A clear upward slope of the fitted regression line shows that aligned districts (coded 1) receive markedly higher grants than non-aligned districts (coded 0). The vertical spread confirms patronage-driven disbursement: even after controlling for flood severity, political loyalty is the strongest predictor of grant size.

Waqf as a Resettlement Vehicle: Promise and Peril

Sindh’s 2,173 registered waqf properties blanket 134,000 acres—an endowment portfolio larger than the combined area of Islamabad and Rawalpindi—yet only 19 % currently generate any income (Sindh Waqf Survey, 2023). The remainder lies either encroached by politically connected land mafias or seasonally submerged under Indus flood-plains, turning potential humanitarian assets into legal battlefields. This vast dormant stock, if unlocked, could offer a Shari‘ah-compliant mechanism for climate-displaced communities who possess neither formal title nor access to statutory compensation. Classical fiqh explicitly permits the creation of a waqf khayrī—an endowment for general welfare—during haraj (emergency). The Hanafi jurist al-Kāsānī (d. 1191) states that “when lands lie idle because of public calamity, their temporary dedication for shelter and subsistence is closer to piety than to sin” (Badā’i‘ al-Ṣanā’i‘, VII: 34). Contemporary resolutions of the International Islamic Fiqh Academy (Res. 191/2019) echo this, allowing emergency leases at nominal rent to protect life and dignity. Despite this doctrinal latitude, interviews with 12 senior ‘ulamā’ in Hyderabad and Sukkur revealed persistent hesitation: eight argued that extending waqf benefits to non-Muslims—who comprise approximately 18 % of the katcha population—could dilute the charitable intent unless expressly stipulated by the original donor. Such doctrinal squeamishness has slowed any systematic mobilisation of waqf land for climate resettlement. A rare counter-example is the 1,600-acre “Goth Haji Khan Waqf” on Hyderabad’s eastern embankment. In 2011, the mutawalli—citing the Qur’ānic imperative of birr (righteousness) and the Maliki principle of “maslahah ‘āmmah” (public interest)—leased 340 acres to 112 displaced Hindu Kohli families on 30-year renewable leases at one-tenth the prevailing market rate. Each lease required the tenant to plant at least one-third of the plot with fruit trees, thereby satisfying the waqf requirement of productive use. External evaluation by the Hyderabad Rural Support Organisation found that household incomes rose 47 % within three years, school enrolment doubled, and no beneficiary family returned to riverbank squatting. Yet the experiment stalled. In 2018, rival claimants accused the mutawalli of misappropriating lease proceeds under section 41 of the Sindh Waqf Properties Ordinance 1979. A district inquiry froze the lease register, suspended new tenancies, and cast a shadow over the entire initiative. Although the charges remain unproven, the episode illustrates the peril that accompanies any attempt to repurpose waqf assets: fiduciary suspicion, sectarian politics, and bureaucratic inertia can swiftly convert promise into paralysis. Unlocking waqf land for climate-displaced communities thus hinges not only on doctrinal clarification but also on transparent governance structures—such as joint mutawalli-civil society boards—that can insulate resettlement decisions from both political capture and religious gatekeeping.

Discussion:

The preceding findings demonstrate that neither secular land law, fiscal federalism nor classical Islamic endowments—taken in isolation—can deliver equitable resettlement for Sindh’s climate-displaced katcha cultivators. A hybrid arrangement is therefore required, one that fuses property rights innovation, fiscal rule-making and Shari‘ah-compliant charity within a single institutional architecture.

Statutory Easement of Climate Refuge

The Land Acquisition Act 1894 (LAA) must be amended to recognise a sui generis “climate-displacement easement” (Faizi, 2023). The proposed clause would allow any cultivator who can establish five consecutive years of continuous possession—via revenue slips, cropping calendars or oral evidence corroborated by village councils—to claim either (a) an alternate

plot of equivalent productive potential from the provincial khalsa (state) land, or (b) monetary compensation indexed to the average gross harvest value over the five pre-flood cropping seasons. Indexation protects against inflationary erosion and aligns state liability with actual livelihood loss rather than with speculative market rates (Balasundharam et al., 2023). To deter moral hazard, claims must be filed within one year of the official flood notification and validated by a joint panel of the Deputy Commissioner and two elected union-council representatives. Precedent for such easements exists in flood-prone Kerala, where the 2019 “Rebuild Kerala” initiative introduced temporary occupancy certificates that convert into transferable leases after rehabilitation (Thomas et al., 2024).

Climate-Displacement Surcharge on NFC Transfers

Experience shows that the Eighth National Finance Award transfers are vulnerable to political discretion (Hanniman, 2020). We propose inserting a mandatory 2 % surcharge on Sindh’s divisible-pool share, hypothecated to a ring-fenced “Katcha-Belt Rehabilitation Fund.” The surcharge would yield approximately PKR 11 billion annually (based on 2023 divisible-pool projections), sufficient to acquire 5,000–6,000 acres of alternate land each year at current notified rates. Disbursements would follow a transparent formula: (population × flood-affected acreage × base grant) audited ex post by the Auditor-General of Pakistan and published quarterly on the Finance Department’s website. Hypothecation precedent can be found in India’s post-Gujarat earthquake “National Calamity Contingency Duty” (Boadway et al., 2024), which earmarked a 1 % levy on central excise for reconstruction.

Public–Waqf Resettlement Partnership

Classical fiqh recognises emergency endowments (waqf al-ṭawārī) for victims of calamity (Ibn ‘Abidīn, 1905). We therefore recommend a legislative amendment to §3 of the Sindh Waqf Properties Ordinance 1979 to explicitly recognise “climate waqf,” permitting mutawallis to lease land to both Muslim and non-Muslim beneficiaries without violating the perpetuity rule (Hussain et al., 2023). A Provincial Waqf Resettlement Board would be created with joint governance: 50 % civil-society nominees (mandating at least 33 % women and 10 % minorities) and 50 % licensed mutawallis. Board decisions would require super-majority approval and be subject to annual public audits. A pilot is already feasible on the 800 surplus acres of Hyderabad’s Haji Khan Waqf. Beneficiaries from the 2022 flood cohort could be issued 30-year renewable leases at one-tenth of the prevailing market rent, financed through Shari‘ah-compliant sukūk (asset-backed securities) that bundle lease receivables into tradable instruments. The sukūk proceeds would fund cluster housing, solar micro-grids and drip irrigation, creating a replicable model for the 134,000 acres of under-utilised waqf land across Sindh.

Conclusion

Climate displacement in Sindh has shifted from episodic shock to structural reality. Katcha-belt farmers are trapped between a colonial land regime that withholds formal title, a federal finance system that dispenses disaster funds by political patronage, and Islamic endowments that remain doctrinally rich but institutionally dormant. The study shows that no single legal or fiscal lever can deliver durable resettlement; instead, a hybrid architecture is essential. A statutory climate-displacement easement would convert long-standing possession into compensable rights; a hypothecated 2 % surcharge on NFC transfers would fund predictable, transparent rehabilitation; and a reformed waqf sector—recognising “climate waqf” and joint governance—would unlock 134,000 acres of charitable land for inclusive resettlement. Piloted in Hyderabad’s Haji Khan Waqf, this tripartite model can be scaled across the Indus basin, turning inevitable floods into opportunities for equitable adaptation. The river must be allowed to swell; its people must be allowed to remain.

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