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Barking up the wrong tree?

Indian street dog woes are emblematic of ecological governance failures for multispecies coexistence

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Abstract (*One Sentence for Policy Forum Articles*)
On August 11, 2025, India's Supreme Court mandated relocating 2.5 million dogs to address bites and zoonotic disease/death concerns—but reversed course twice since then—revealing that solutions require sequential waste management, education, and sterilization that prioritize addressing root demographic and behavioral drivers over reactive management.

A multispecies coexistence blind spot

On August 11, 2025, the Indian Supreme Court (SC) directed local governments and civic bodies within Delhi and the National Capital Region (NCR)—an area encompassing approximately 4,500 km²—to capture and relocate approximately 2.5 million* free-ranging dogs from public thoroughfares to (nonexistent) shelters within eight weeks (*1*, *2*). SC's motivation was to mitigate the estimated 20 million dog bites occurring annually in India, which contribute to approximately 40% of global fatalities from rabies, i.e. ~20,000 human deaths/year (*3*). Yet merely 11 days later, on August 22, 2025, SC revised its mandate following nationwide protests (*2*), with an online petition opposing the relocation order garnering nearly 370,000 signatures. The revised directive instead mandated sterilization, immunization, and return of captured dogs to their original neighborhoods while prohibiting feeding on roads and public places, but suggested creation of "designated feeding spots". Surprisingly, on November 07, 2025, SC reverted to its initial directive, mandating the immediate removal and relocation of free-ranging dogs from educational institutions, public transport zones, and hospitals to (nonexistent) shelters. Furthermore, the court stipulated that these areas must be fenced to preclude the re-entry of dogs, and concurrently instructed the removal of cattle from highways *(2)*.

Why did a policy ostensibly designed to protect public health provoke such fierce opposition that India's highest court reversed course within days? In this paper, we explore the social-ecological complexities underlying governance issues and propose alternative, evidence-based policy frameworks that address root demographic drivers rather than symptoms—approaches potentially more effective and politically sustainable than reactive removal efforts.

The scale and geographic context

India has a population of >80 million free-ranging dogs—part of a global population exceeding 800 million—living side-by-side with people in urban to rural areas. Such dogs and other commensals thus pose unparalleled challenges to multispecies coexistence *(3)*, in which public health, animal welfare, ecology, and environmental justice converge. Delhi exemplifies extreme density dynamics: despite occupying an area 160 times smaller than the neighboring state of Uttar Pradesh, it sustains free-ranging dog densities 70 times higher, concentrating ~35 million people and an estimated 800,000 dogs within 1,500 km². Dogs thrive here because of 327,069 feeding stations and 85,109 garbage points, which provide abundant, spatially concentrated food sources (*1*). Over the past 25 years, Delhi has experienced simultaneous dramatic increases in built-up area, human and free-ranging dog populations, vehicular density, per capita income, and organic solid waste production—with most indicators rising 200-300% (*1*, *4*). These create a tightly coupled social-ecological system where escalating consumption drives waste generation, which in turn sustains elevated populations of free-ranging dogs and other commensals.

This crisis extends far beyond Delhi. Given that Delhi's development trajectory is emblematic of the heterogeneous urbanism characterizing Global South megacities (*5*), these canine conundrums are neither confined to the NCR nor exclusive to South Asia. Rapidly urbanizing cities, e.g., Bengaluru, Karachi, Nairobi, Laos and Dhaka, across the region confront similar challenges where human population density, inadequate waste management infrastructure, cultural feeding practices, and free-ranging dog populations converge (*3*). Recognizing this broader context, the Indian Supreme Court subsequently extended the purview of its August 11, 2025, directive nationwide (*2*). Alongside, the pressing nature of dog-mediated zoonotic disease has prompted the World Health Organization to establish a goal of eradicating dog-transmitted rabies by 2030 *(3)*.

Why so many dogs: the resource subsidy trap

Free-ranging urban dog ecology—their distribution, abundance, and behavior—is determined by anthropogenic food subsidies. Indian cities generate approximately 150,000 metric tonnes of urban solid waste daily, with food waste averaging 50 kilograms per person annually (*6*). Unmanaged garbage dumps serve as reliable, predictable food sources, supporting higher reproduction and survival rates in dogs, increasing urban carrying capacities. This waste-driven resource abundance is compounded by intentional provisioning: religious feeding practices, compassion-motivated provisioning, and organized community feeding collectively create spatially concentrated dog populations in high human-activity areas (*1*, *7*).

These high densities in small areas create tension between dogs and people. Economic prosperity in cities like Delhi paradoxically exacerbates rather than resolves the crisis when cultures, science, and policies do not align: higher per capita income generates more waste, enabling larger dog populations that create more conflict (*7*). Furthermore, the catastrophic decline of vultures in the Indian Subcontinent has led to competitive release effects on facultative scavengers/commensals, including free-ranging dogs and rats, with public health impacts (*9*).

Why the relocation mandate failed: operational impossibility faced cultural opposition

The Court's initial directive prioritized immediate removal of 5,000 dogs from "high-risk areas" as a first phase, with complete removal of 2.5 million dogs across the NCR to follow within eight weeks (*2*). This reactive mass-relocation approach was both operationally impossible and scientifically incoherent. Delhi and surrounding cities lack infrastructure to house even a fraction of this population. Even hypothetically, constructing and operating shelters at this scale would require several years of sustained effort and significant financial investment, during which the remaining free-ranging populations would continue to reproduce. The directive also overrode existing Animal Birth Control Rules (2023), which emphasize catch-neuter-vaccinate-release (CNVR) protocols that return dogs to their original territories—an approach supported by decades of international veterinary and conservation consensus. Most critically, the "vacuum effect" shall ensure that dog removed following SC's order will swiftly be replaced by immigrants from peripheral areas drawn to persistent food resources (*2*, *10*).

Beyond logistical impossibility, mass permanent sheltering poses severe risks to animal welfare and public health unless properly implemented. Overcrowded facilities could become disease hotspots: canine distemper, parvovirus, and respiratory infections could spread rapidly through confined, stressed populations unaccustomed to captivity. Such potential welfare concerns—chronic stress, behavioral deterioration, heightened aggression, elevated mortality—prompted protests by civil societies and dog lovers/non-governmental organizations because the court's suggested approaches directly contradicted the compassion motivations underlying religion-inspired feeding practice: *to care for God's creations*, who suffer when humans proliferate (*9*). India's historically celebrated tolerance for animals in proximity—rooted in ancient philosophical traditions of *ahimsa* (non-violence) and *karmic* accumulation through compassionate acts—is routinely lauded internationally as an exemplary model of multispecies harmony (*7*). But the presence of ambivalence and internal contradictions within communities regarding dog feeding practices, coupled with concerns about population growth, conflict risks, and (regional) ethical unease over interventions such as sterilization and mass relocation, ignited mutually contradictory public outcry across both physical and digital platforms (*1*). This cultural complexity defies simplistic management prescriptions and underscores that coexistence is negotiated not only between humans and animals but within human communities holding divergent values and interests.

Intersections in dog and human ecology

Free-ranging dogs prefer denning near humans and exhibit social changes that likely increase aggressive interactions. People from all economic/social classes feed dogs, making territorial aggression issues pervasive (*1*). Such social-ecological dynamics in tropical/developing cities transform human-dog relationships from dependence to apathy to outright conflict, with dogs forming territorial associations around predictable food sources (*10*).

When individual feeders establish relationships with dogs, they form mutualistic bonds characterized by tail-wagging and affectionate displays toward specific humans. However, these same dogs simultaneously develop territorial associations with feeding sites and exhibit strategic aggression—barking, chasing, biting—toward unfamiliar individuals perceived as threats (*1*). This categorical discrimination between familiar people (who feed) and (intruding) strangers represents an evolutionary legacy: dogs evolved capacities to discriminate human emotional expressions and respond differently. Conversely, shy or non-affiliative dogs remain relatively predictable until cornered by urban infrastructure—roads, walls, or crowds—whereupon defensive aggression escalates rapidly. SC's latest recommended fencing would exacerbate these effects *(2)*. This behavioral heterogeneity complicates risk assessment and mitigation strategies across diverse urban microenvironments. Research in Delhi and Bengaluru demonstrates that feeding creates concentrated territorial dog populations, with houses, markets, abattoirs and garbage piles constituting dogs' most important resource sites (*1, 10–13*).

At human-wildlife interfaces—particularly in peri-urban and protected area buffer zones—dogs exert multifaceted ecological pressures on native biodiversity (*14*). Dogs outcompete canids such as jackals and foxes, and introgress maladaptive traits into wolves through hybridization (*15*, *16*). They prey on threatened ungulates and bird nests, including the endangered black-necked crane and the critically threatened Great Indian Bustard. High prevalence of exposure to canine distemper virus (exceeding 90%) has been documented in dog populations around critical wildlife habitats. These pathogens have devastated threatened populations, including Asiatic lions, while predation pressure further compromises already vulnerable species. The cumulative effect transforms dogs into what conservation ecologists term "hyperpredators"—subsidized by anthropogenic resources yet exerting predation and disease pressure disproportionate to natural ecosystem dynamics (*17*).

The urgent nature of the situation is undeniable, yet current governance approaches address aggressive dogs and bite incidents while ignoring the demographic engine: anthropogenic resource subsidies that sustain unsustainable populations (*1, 18*). This crisis embodies environmental injustice. For instance, marginalized communities residing in neighborhoods with insufficient waste management infrastructure experience disproportionate dog-related health burdens—bites, rabies exposure, psychological stress from navigating threatening territories as casual laborers—while possessing limited access to post-exposure prophylaxis, veterinary care, or political leverage necessary to advocate for infrastructure improvements. The multispecies coexistence challenge thus reflects not merely animal management failure but structural inequities wherein development patterns distribute benefits and ecological burdens unequally (*1*).

Integrated solutions: a stakeholder framework

Evidence-based management requires moving beyond reactive directives to systematic, multi-component interventions implemented in logical sequence. The World Organisation for Animal Health emphasizes responsible dog ownership, reproductive control, CNVR, access to veterinary care, environmental controls, and education for safe human-dog interactions (*19*), yet empirical evidence of successful implementation at a tropical megacity scale is nonexistent. Small-region successes—Goa, India (*20*, *21*) and Bhutan (*22*)—demonstrate feasibility but require adaptation to Delhi's extreme density and resource abundance. The fundamental challenge lies in implementing these components concurrently and at sufficient scale—a systems-level approach conspicuously absent from most governance strategies, which instead pursue sequential, reactive interventions failing to address root demographic drivers. We propose a phased, 5-year approach, prioritizing interventions that create enabling conditions for subsequent measures:

- **Phase 1: Waste Management Infrastructure (Foundation, Months 0-60)** Waste infrastructure improvements constitute the single most impactful intervention, directly reducing the carrying capacity sustaining elevated dog populations.
- **Phase 2: Public Education and Cultural Norm Shifts (Concurrent, Months 0-48)** Concurrent with waste infrastructure development, comprehensive education campaigns must target multiple audiences with tailored messages described below in an action-specific framework, focusing on diseases like rabies, which is incurable once contracted. There are vernacular myths associated with this disease, which contribute to fatalities.
- **Phase 3: High-Coverage Sterilization (As Resources Decline, Months 06-60)** As waste management improvements reduce food availability, intensive Animal Birth Control programs achieving 70-80% sterilization coverage should be implemented, emphasizing female-targeted sterilization to address the demographic bottleneck.
- **Phase 4: Spatial Zoning and Targeted Interventions (Ongoing, Months 12-60)** Spatial analysis should identify high-conflict zones where multiple risk factors converge—dense human populations, inadequate infrastructure, territorial dog concentrations, and vulnerable demographics.

The parable of blind stakeholders examining an elephant

Like the classical Indian parable of blind scholars each touching different parts of an elephant and describing fundamentally different creatures, contemporary discourse on free-ranging dogs fragments into irreconcilable positions—each perceiving partial truth while missing systemic complexity. Dog welfare advocates emphasize compassion and individual animal suffering; public safety constituencies prioritize human health and fear; waste management professionals see infrastructure deficits; ecologists recognize population dynamics; religious practitioners view feeding as spiritual practice; veterinarians confront disease and behavioral pathology. Each stakeholder group possesses legitimate concerns and unique insights, yet siloed advocacy yields polarized debates rather than integrated solutions.

The result is policy paralysis in which competing constituencies cancel rather than complement mutual efforts: substantial resources are consumed without demographic impact, vulnerable human populations bear disproportionate risks, and dogs themselves suffer in unsustainable populations exposed to chronic stressors. The path forward requires transcending false dichotomies—animal welfare *vs.* public safety, compassion *vs.* pragmatism, removal *vs.* retention—to construct stakeholder-specific action frameworks that address distinct aspects of the crisis while collectively targeting root cause (*18*). Below, we identify key stakeholder groups and their complementary contributions:

i) Dog lovers: the largest human community and primary behavioral architects

Dog welfare advocates, tolerant residents, and casual feeders constitute the numerically dominant stakeholder group. This is evidenced by the fact that, if public sentiment favored complete removal, political pressure would have mandated such interventions decades ago (*7*). However, this numerical majority also bears responsibility for understanding how provisioning behaviors shape dog population dynamics and behavioral ecology. As discussed, dogs evolved cognitive abilities enabling discrimination between familiar feeders and unfamiliar strangers—capacities now deployed in contexts radically different from ancestral coevolutionary scenarios, creating territorial defense dynamics that concentrate aggression around feeding sites (*12*).

- *Action framework*: Free-ranging dogs fundamentally do not require direct human feeding—they are evolutionarily adapted scavengers capable of subsisting on dispersed food sources when waste management is inadequate. What dogs require are refuge areas offering shelter, water access, and opportunities to avoid human contact when desired—precisely what megacities' built environment increasingly denies through infrastructure compression (*1*). If feeding practices continue, caregivers must accept corresponding responsibilities: systematic CNVR programs, territorial monitoring to identify aggressive individuals requiring intervention, and, crucially, awareness that any form of resource provisioning influences behavioral repertoires, including territorial defense. The goal should not be creating dependent populations of semi-owned street dogs concentrated around feeding stations, but rather supporting systematic management programs stabilizing populations at ecologically sustainable densities while improving welfare through CNVR and infrastructure that enable human-dog spatial segregation (*18*).

ii) Public Safety Constituencies: legitimate concerns demanding targeted solutions

Individuals and families who have experienced dog attacks, parents concerned for children's safety (58% of all bite victims are under 15), elderly residents with reduced mobility, and anyone navigating unfamiliar neighborhoods where territorial dog packs concentrate (e.g. blue-collar workers)—possess entirely valid concerns (*23*, *24*). However, blanket removal—even if logistically feasible only via mass culling—would likely worsen conflicts through the vacuum effect, potentially introducing less habituated, more aggressive individuals as immigrants replace removed dogs.

- *Action framework*: Rather than advocating large-scale removal, contradicted by ecological evidence and socially divisive concerns, concerned citizens can contribute meaningfully by reporting genuinely dangerous or rabid individual dogs for targeted intervention. This requires distinguishing normal territorial displays from pathological aggression (unprovoked attacks, sustained pursuit, rabid behavior). Municipal authorities and researchers require granular data on specific problematic animals, locations where aggressive encounters concentrate, and temporal patterns of high-risk interactions to implement evidence-based spatial mapping and targeted interventions (*23*). Additionally, public safety advocates should demand infrastructure modifications reducing encounter rates: pedestrian pathways separated from dog congregation areas, improved street lighting in high-risk zones, waste management improvements to eliminate food sources, and ABC program funding sufficient to achieve demographic impact (*25*).

ii) Professionals: waste management, animal behavior/health experts, and urban ecologists

The institutional reality reflects a fundamental paradox: courts mandate "evidence-based Standard Operating Procedures" while systematically neglecting to invest in foundational science (*2*). As noted earlier, comprehensive ecological assessments of dog population demographics across urban microhabitats, longitudinal behavioral studies examining infrastructure impacts, epidemiological surveillance tracking zoonotic disease persistence, and multispecies urban planning frameworks remain absent (*24*).

- *Action Framework:* Waste management engineers must collaborate with ecologists and animal behaviorists to quantify how infrastructure modifications affect dog demographics, movement patterns, and resource access through controlled experiments comparing neighborhoods with different waste management systems. Ethologists and ecologists must conduct systematic surveys across Delhi's socioeconomic gradient to map spatial variation in population ecology, aggression thresholds, territorial boundaries, and behavioral responses to interventions. Epidemiologists must establish surveillance networks to track rabies and zoonotic disease prevalence relative to dog density, human demographics, waste management quality, and ABC coverage—identifying where disease persistence concentrates and what interventions most effectively disrupt transmission. Urban ecologists should develop spatially explicit models integrating these data streams to predict conflict intensification under different development scenarios, enabling proactive management (*7*, *24*, *26*). Crucially, research cannot remain confined to academic publications—findings must translate into accessible policy briefs incorporated into municipal planning and communicated to all stakeholder groups.

iii) Religious leaders and mass feeding operations: spiritual practice meets ecological consequence

Cultural and religious feeding practices—wherein provisioning street animals constitutes devotional practice, *karma* or *punya* or spiritual merit in religious traditions—represent deeply embedded customs that cannot be dismissed by regulatory fiat (*7*). However, spiritual intentions do not exempt actions from ecological consequences. Free-ranging dogs evolved as opportunistic scavengers exploiting dispersed, unpredictable food sources—not as provisioned recipients of abundant, concentrated meals (*1*).

- *Action framework:* Acknowledge that mass feeding programs, while spiritually motivated and compassionate in intent, generate demographic dynamics that ultimately harm the animals advocates seek to help. Elevated populations intensify disease transmission (including rabies), vehicle injuries from road-based feeding attracting dogs into traffic, reproductive stress from competition, and human-dog conflicts generating political pressure for harmful removal efforts (*7*). If feeding practices continue as a spiritual imperative, they must integrate into comprehensive management frameworks: designated feeding sites away from high-traffic areas, coordinated with municipal sterilization operations, ensuring CNVR and veterinary care, establishing accountability and evidence. This shall establish accountability and crucially, recognize that population stabilization serves animal welfare more effectively. Religious leaders command cultural authority capable of transforming public attitudes—that influence should leverage responsible coexistence emphasizing CNVR, waste management, and understanding that genuine compassion sometimes requires limiting rather than maximizing provisioning (*18*).

Conclusion: debunking myths for evidence-based coexistence in the *Anthropocene*

A common misconception suggests that adequately nourished and cherished dogs present minimal risk of biting. However, evidence from veterinary and behavioral ecology contradicts this notion: aggression frequently emerges as a significant issue in well-provisioned pet dogs, manifesting as conflicts, fear, and resource guarding directed towards their owners. Furthermore, research has elucidated the fitness benefits of aggressive offspring defense in commensal species, which likely underlie the adaptive value of choosing human proximity despite inherent risks (*27*). Hence, the propensity among territorial commensal breeders to attack human intruders is generally exacerbated by higher access to food subsidies (*27*).

Delhi's transformation into one of the world's most economically dynamic megacities presents both challenges and opportunities (*28*). The same prosperity that *a)* generates abundant food waste; *b)* cultural traditions motivating individual compassion toward animals; and *c)* technological sophistication enabling rapid urban development, can be applied to waste management, spatial planning, and epidemiological surveillance systems. What remains absent is the political-cum-public will to prioritize long-term, systems-level solutions. The "human-dog coexistence problem" serves as a proxy for deeper questions about who occupies urban space, whose needs receive priority, and how development distributes the costs and benefits of multispecies coexistence across social strata (*1*, *7*). This structural inequity demands recognition: the free-ranging dog crisis reflects not merely animal management failure but environmental injustice, in which development patterns distribute benefits and ecological burdens unequally.

India's dog crisis offers critical lessons for rapidly urbanizing tropical cities worldwide (*29*). Tropical (mega)cities embrace Western infrastructure while maintaining cultural tolerance for commensal animals, creating novel socio-ecological configurations without established management frameworks (*7*). Sustainable coexistence requires uncomfortable honesty: compassion divorced from ecological realism perpetuates animal suffering through unsustainable populations exposed to chronic disease, resource competition, and human conflict. Only integrated frameworks—adequately funded, professionally implemented, and sustained across electoral cycles—can transform this crisis into a model in which genuine animal welfare, public safety, and environmental justice converge in a convivial way.

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*** (page #1):** Extrapolation from the density estimates in Delhi, following *(1).*

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Ethical Statement

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