

Beyond Population Control: A Comprehensive Framework for Sustainable Stray Dog Management in India

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ABSTRACT

The management of stray dogs in India straddles public health, animal welfare and urban governance. As per estimates, India has between 15-62 million free-roaming stray dogs. Stray dogs and dog bites and dog-mediated rabies are responsible for 18,000-20,000 deaths annually. These deaths take place despite decades of legislation (World Health Organization, 2018; Ministry of Fisheries, Animal Husbandry and Dairying, 2023). The Prevention of Cruelty to Animals Act 1960 and the Animal Birth Control Rules, 2023 do mandate a sterilize-vaccinate-release approach, but it is often poorly funded or badly implemented. The Supreme Court's involvement in 2025 renewed a debate on relocation versus release-based management, revealing a lack of national framework.

The comparative policy analysis of official government reports, published documents from international organizations, peer-reviewed literature, and an examination of international experience from the Netherlands, Bhutan, Singapore, Turkey, and the UK used in this paper is of secondary qualitative design. It presents a ten-pillar Integrated Policy Framework for scientific population estimation, mass sterilization, universal vaccination, responsible ownership, waste management, monitoring technology, community participation, institutional coordination, diversified funding and proper monitoring and evaluation. The results evidence the need for a shift from episodic, judiciary-driven intervention for intervention to a coordinated, adequately funded, technology enabled governance model. The paper sets forth practicable recommendations for policymakers to reconcile animal welfare with public safety.

Keywords: stray dog management, Animal Birth Control Rules, rabies elimination, One Health, urban governance, animal welfare policy, public health India

1. Introduction

India tolerates free-roaming dogs because of cultural acceptance, reverence toward animal life in religion, lack of municipal infrastructure and unresolved public health risk. Unlike most high-

income countries, which decreased stray populations considerably through the twentieth century, India has one of the largest free-roaming dog populations in the world (estimated at about 15.3 million based on the 2019 livestock census and over 60 million in more recent independent assessments (Ministry of Fisheries, Animal Husbandry and Dairying, 2023; Sigma Earth, 2025)). Of course, this discrepancy speaks to a systematic failure of any standardized methodology for enumeration at the national level. Dog bites incidents rose from a reported figure of approximately 2.18 million in 2022 to a whopping 3.71 million in 2024, a rise of 45 per cent within two years (ETV Bharat, 2025). Despite rabies claiming an estimated 18,000–20,000 deaths each year, India accounts for about 36 per cent of rabies deaths worldwide (World Health Organization, 2018), children are often bite victims and also the group less likely to seek prompt post-exposure prophylaxis.

Concerns over animal welfare are equally serious. Free-roaming dogs are often malnourished and suffer from untreated injuries and diseases. Meanwhile, controlling free-roaming dogs by ad hoc measures raises ethical and legal questions under the Prevention of Cruelty to Animals Act, 1960. Fragmented jurisdiction adds to the problem under Article 246 and the Twelfth Schedule, animal control functions are assigned to urban local bodies which frequently lack the expertise, veterinary manpower, and financial resources to implement the Animal Birth Control (ABC) Rules (Tribune India, 2023). The Supreme Court's decision came in response to a suo motu petition following a child's death from rabies in 2025 which made glaring the governance vacuum at the national level. The court initially held that all stray dogs in Delhi-NCR must be permanently relocated to shelters before a larger bench directed the sterilize–vaccinate–release model and extended the proceedings to include review of a pan-India policy exposing the lack of a coherent, evidence-based national framework.

This paper critically reviews current stray dog management architecture in India, examines existing legal and policy instruments, draws comparative lessons from international best practice, and proposes an integrated, technology-enabled policy framework. The importance of this framework is that it provides a proactive alternative to judicial or regulatory intervention which is informed by scientific population management, institutional accountability and measurable outcomes.

2. Research Methodology

This research paper adopts a secondary qualitative research design. Such a design is suitable for a policy analysis where the objective is to combine three complimentary qualitative approaches.

Policy analysis systematically examines the body of India's principal legal instruments in the Prevention of Cruelty to Animals Act, 1960 and the Animal Birth Control Rules, 2001 with the

2023 revision and relevant judicial pronouncements to study their coherence, implementation gap and enforcement.

We conduct comparative analysis using case studies from the Netherlands, Bhutan, Singapore, Turkey, and the UK, identified as having documented outcomes ranging from the near elimination of free-roaming populations to establishment of national sterilization campaigns, to identify transferable principles of governance.

The data to be thematically analysed comes from reports issued by government agencies, publications by international organisations and peer-reviewed literature in the field of population management and public health, governance, technology and community participation.

The World Health Organization (WHO), World Organisation for Animal Health (WOAH), Food and Agriculture Organisation (FAO), Animal Welfare Board of India (AWBI), India's Ministry of Fisheries, Animal Husbandry and Dairying and peer-reviewed journals like Preventive Veterinary Medicine, Animals (MDPI) and Journal of Advanced Health Research & Clinical Medicine.

Given the fast-developing 2025 policy and court landscape, ongoing news and legal analysis reporting was added, clearly identified as distinct from academic evidence throughout.

3. Current Status of Stray Dog Management in India

Population estimates vary widely by method and date. According to the livestock census conducted by the Ministry of Minsitries of Fisheries Animal Husbandry and Dairying in 2019, the figure is over approximately 1.53 crore (15.3 million) (Tribune India, 2025), still being quoted in recent Supreme Court cases and others. Similarly, the independent evaluations show a number from 60-62 million in total (Tribune India, 2023; Mongabay India, 2025). The four-fold disparity between the official estimate in Thailand and those of independent observers is a governance failure with real policy implications, since one cannot calibrate resource allocation, sterilization targets, and shelter capacity.

Due to available garbage food, urban centres have higher dog densities. On the other hand, the northeastern states report a lower dog population, thanks to dog adoption which is being practiced culturally (IndiaDataMap, 2025). The stray population of Delhi was estimated to be more than 55,000 in late 2023 (ETV Bharat, 2025). The national burden of dog bite cases in 2024 has increased rapidly to 3715713 cases with Maharashtra, Tamil Nadu, Gujarat, Karnataka and Bihar having the highest state level burdens (Tribune India, 2025) and over 128000 cases in Mumbai alone (Deccan Herald, 2025). Rabies is quite deadly. 54 of them died nationally in 2024 because of it. However, it is believed that these numbers are greatly underreported. The real

estimate is close to 18,000-20,000 a year (Tribune India, 2025; World Health Organization, 2018).

Municipal issues are multi-faceted. The government deallocated a budget of ₹24.4 lakhs (2018-19) and ₹4.03 lakhs (2020-21) for the implantation and sterilization (or birth control) of stray dogs. The government also has not made any central allocation after 2021. Consequently, the burden is effectively passed to the state and municipal governments (NewsMeter, 2025). This comes although the government sent a formal communication to comply with the ABC Rules, 2023, in March itself. Mismanaged municipal solid waste gives rise to a continuous food-source that sustains their breeding, thereby making sterilization efforts ineffective. Moreover, community feeding has become a key source of conflict between animal welfare supporters and resident welfare associations since the 2025 Supreme Court proceedings pushing for designated feeding zones (News on Air, 2025). Public opinion is still very much divided between safety and welfare.

4. Critical Analysis of Existing Policies

According to Tribune India (2023), the Prevention of Cruelty to Animals Act, 1960, lays down the basic legal structure for animal protection in India, along with the setting up of the Animal Welfare Board of India in 1962. The Act makes needless cruelty a crime; nevertheless, it does not by itself mandate population control which has been left to subordinate legislation principally the Animal Birth Control Rules first notified in 2001 and substantially revised in 2023 which mandated a Capture–Sterilize–Vaccinate–Return approach prohibiting the killing or permanent removal of healthy dogs.

The 2023 modification brought in better accountability mechanisms comprehensive humane capture methods minimum veterinary qualification standards CCTV monitoring and community briefing requirements (Tribune India 2023) but implementation has been patchy. The authorities did not find a single clinic enough to cater to the dog population of the area. It was observed that achievements were diluted owing to a lack of manpower and procedural inefficacy. This was despite there being a formal compliance with the AWBI standard operating procedure (Amrutha, 2024). This can also be seen in the trend at a national level with municipal implementations being underfunded.

The evidence that has been peer-reviewed offers a more complex picture than either advocates or critics usually give. A landmark study in Jodhpur found that despite the dog population size significantly declined in three of the five surveyed area between 2005-2007, sterilisation and vaccination coverage in treated zones was 61.8–86.5 per cent (Totton, Wandeler, Ribble, Rosatte, & McEwen, 2011). There was a measurable health benefit even in untreated dogs in the

same community (Yoak, Reece, Gehrt, & Hamilton, 2014). Yet, this coverage, of sterilization which exceeds 83 per cent for fertile females, sustained systematically across defined zones, is likely required to break the breeding cycle a level not often achieved in Indian municipalities (Chaudhari et al., 2022).

The situation is worsened by municipal governance that adds to technical problems. Implementation capacity varies enormously by the ULB fiscal health. Besides, national rabies control programmes suffered the same funding volatility that the central grants data document. Therefore, sustained investment needed to reach elimination targets is undercut. (World Health Organization, 2018).

5. International Best Practices

Lessons from comparative international experience instructive but not transplantable. In the Netherlands, the absence of free-roaming dogs is almost total. This was achieved through a combination of initiatives, including sterilization schemes at subsidized national levels that have spanned over decades. It also involved enacting anti-abandonment provisions in the Animal Protection Act of 1962, registration laws and more (Environmental Literacy Council 2025, Seasia 2025). The Netherlands did not simply coin a nice phrase like sterilise-and-return as India did. This is why over the decades, more and more rehoming became favoured as the model over the release option. The multi-decade journey in the Netherlands also underlines the need for cultural change on pet ownership and abandonment along with legislation.

Bhutan may be the most operationally relevant comparator given similarities of culture and religion that rule out culling. The Nationwide Accelerated Dog Population Management and Rabies Control Programme was an initiative launched in 2022 under royal command in Bhutan. It builds on a sterilisation programme that started in 2009 with support from Humane Society International (World Organisation for Animal Health, 2023). As of October 2023, Bhutan was the first country to sterilize its entire free-roaming dog population. This population was 61,680 dogs nationally, of which 56,251 (91 per cent) were free-roaming, with 95 per cent vaccinated against rabies as well as over 32,000 pet dogs microchipped. This was independently validated by a third party – (World Organisation for Animal Health, 2023) . Due to strong commitment from the leadership, mobilization of community-volunteer groups, mobile technology for tracking status, and a phased campaign structure (The Bhutanese, 2023), Bhutan's success cannot be used to extrapolate. Nonetheless, the technology-enabled and politically-championed model provides a transferrable template.

Singapore heavily depends on strict licensing, mandatory microchipping and well-resourced municipal enforcement which is not the case with most Indian ULBs. Turkey is a large-scale,

culturally similar counterexample under a national no-kill, sterilize-and-release policy which, although plagued by implementation problems due to large shelter backlogs, also suffers periodic reversals. Similar capacity constraints apply. Through strict licensing and microchipping regulations from 2015, as well as a well-resourced dog warden service, the United Kingdom has successfully eradicated free-roaming populations. The case for registration is strengthened by this success.

Three lessons are broadly applicable to India. Firstly, as in Bhutan, there needs to be high-level political commitment to overcome coordination failures. Secondly, technology-enabled tracking of sterilization and vaccination status can be a scalable model for addressing accountability gaps in India. Finally, sustained multi-year funding, as seen in the Dutch and Bhutanese cases, sharply contrasts with the volatility of central ABC grants after 2018 in India.

6. Proposed Integrated Policy Framework

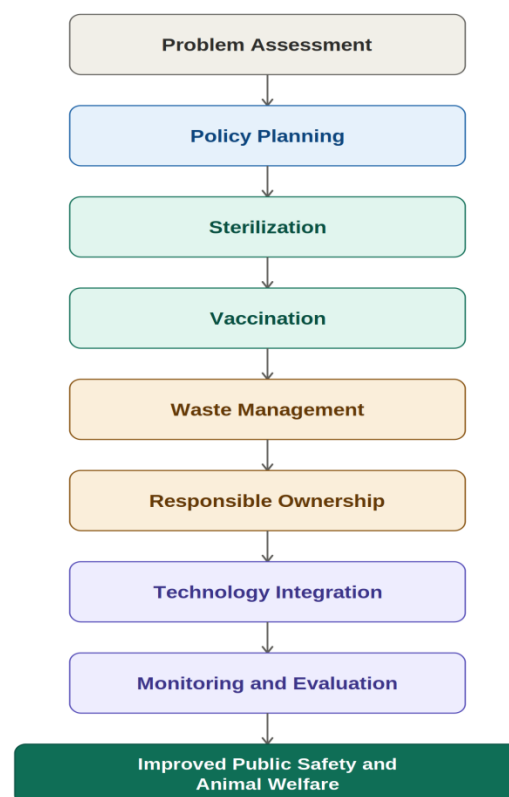


Figure 1. *Conceptual Framework of Sustainable Stray Dog Management. The framework depicts a sequential pathway from problem assessment through policy planning, sterilization, vaccination, waste management, responsible ownership, technology integration, and monitoring, culminating in improved public safety and animal welfare outcomes.*

“Building on the preceding critical analysis and comparative international lessons, this paper proposes a ten-pillar Integrated Policy Framework, implementable within India's existing constitutional division of responsibilities. Figure 1 illustrates its conceptual logic, tracing the pathway from problem assessment to improved public safety and animal welfare outcomes.”

6.1 Scientific Population Management

A standardized, GIS-enabled national dog census should be conducted bi-annually across all ULBs and will provide foundation for evidence-based planning. Without reliable baseline data, sterilization, shelter and vaccination targets cannot be set in a meaningful manner. All of this shows up in the fourfold difference in estimates discussed in Section 3.

6.2 Mass Sterilization

In line with the evidence that coverage in excess of 83 per cent of fertile females (to interrupt the breeding cycle) is essential, the framework recommends campaigns that are geographically phased, female prioritized and sustain high coverage within defined zones before expansion, unlike the diffuse coverage seen in current day practice (Chaudhari et al., 2022).

6.3 Universal Anti-Rabies Vaccination

Vaccination should happen along with all sterilization drive. It should not be done separately. WHO's Zero by 30 says that mass dog vaccination is the best tool to interrupt transmission of rabies at its animal reservoir (World Health Organization, 2018).

6.4 Responsible Pet Ownership

Making all owned dogs microchipped and registered, and penalising those that abandon their dogs, addresses a root cause of stray population growth, which sterilisation by itself cannot do. This is learnt from the Dutch and Bhutanese experience of formalisation of ownership-backed accountability.

6.5 Scientific Waste Management

Dog population management along with the segregation of municipal solid waste represents a combination that reduces uncontrolled food source sustains in the neighbourhood. Breeding is independent of sterilisation coverage. Interaction of this kind is largely absent from ABC implementation.

6.6 Technology Integration

A national digital dog registry GIS mapping, QR tagging and microchipping, AI-assisted population monitoring, public-facing mobile app, and a real-time dashboard will address the accountability gaps noticed in the Kozhikode evaluation and are on the lines of the mobile-technology approach attributed to Bhutan's success (Amrutha, 2024; World Organisation for Animal Health, 2023).

6.7 Community Participation

It is important to design activities like feeding zones and partner with resident welfare associations to reduce the feeder–resident conflict that was at the forefront of the 2025 court case and develop the volunteer capacity that was instrumental in the campaign of Bhutan (News on Air, 2025). Coordination in Institutions. The governance framework proposed is shown in Figure 2 which integrates central policy generation, state resourcing, municipal implementation, veterinary technical support, NGO service delivery, and community participation under a common monitoring agency. This is essential to deal with the overlapping mandates identified in Section 4.

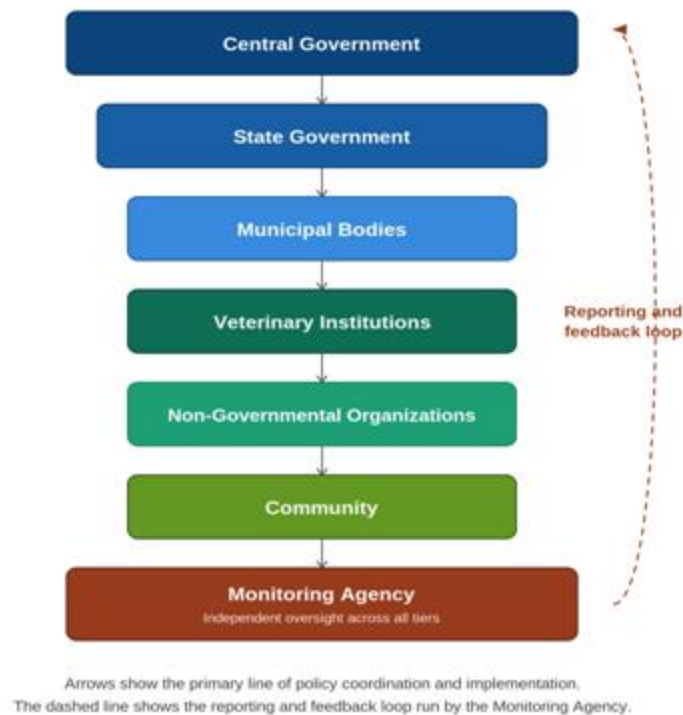


Figure 2. Stakeholder Governance Framework. The diagram illustrates the proposed multi-tier coordination structure linking central government, state government, municipal bodies, veterinary

institutions, non-governmental organizations, and community stakeholders under a common monitoring agency.

6.9 Funding Framework

In light of the erratic pattern of central ABC funding since 2018, a diversified funding model is recommended. It should comprise of ring-fenced municipal budgets, state grants-in-aid, restored central funding, CSR contributions and public–private partnerships for shelter and veterinary delivery (NewsMeter, 2025). Monitoring and Evaluation Framework 6.10 This five-phase assessment capacity building implementation monitoring and policy review supported by KPIs clear (sterilization and vaccination coverage incidence of dog bites mortality rabies shelter utilization) compulsory annual review by State Animal Welfare Boards periodic independent third party audit in line with Bhutan validation model continual digital monitoring.

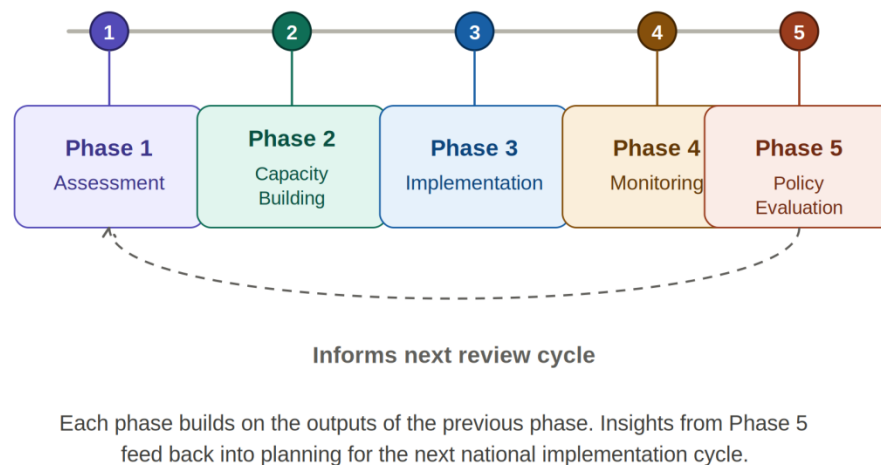


Figure 3. *Implementation Roadmap. The proposed five-phase roadmap sequences assessment, capacity building, implementation, monitoring, and policy evaluation activities for national rollout of the Integrated Policy Framework.*

7. Policy Recommendations

Policymakers ought to carry out a dog census using GIS, biennially, restore central ABC funding (NewsMeter, 2025), and increase coverage to 70–83 per cent for sterilization before further expansion (Chaudhari et al., 2022), along with universal vaccination (World Health Organization, 2018) and a digital registry on the lines of Bhutan’s programme. Compulsory pet registration, waste management integration and designated feeding zones (News on Air, 2025) tackle the root causes, while a One Health coordination mechanism, diversifying CSR funding

and expanding veterinary partnerships plug workforce gaps (Amrutha, 2024) Annual review, independent audit and Supreme Court-compliant shelter standards get wide public education complete.

8. Conclusion

Tackling the issue of stray dogs in India has become a delicate balancing act between public health and animal welfare considerations, as well as the limits of municipal governance. The events of 2025 which saw conflicting orders from the Supreme Court bring to fore the lack of a coherent national framework are illustrative of the costs of decades of fragmented, under funded implementation of the Animal Birth Control Rules. Evidence that sterilization-based population management can be effective with enough coverage and consistency from peer-reviewed literature. International experience especially that of Bhutan's national programme shows that politically-initiated, technology-enabled, well-funded interventions have achieved what was earlier thought not possible in similar cultures and resource scarcity. This paper proposes an Integrated Policy Framework, which provides a pathway from a reactive, judiciary-driven approach to a more coordinated, accountable, and measurable system in india. For it to work out, continual political commitment, funding that is restored and stabilized, and true inter-institutional coordination across central, state and municipal levels will be required. Future research should focus on rigorous longitudinal evaluations of sterilization coverage outcomes in different Indian municipalities, and implementation studies of digital registry systems, to build an evidence base for scaling up effective interventions nationally.

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