

Table 1 Policy options for canine population management in Morocco (continued)

Policy options	Description	Main advantages	Main disadvantages	Cost and feasibility	Equity considerations	Key stakeholders
Adopting the TNVT approach	<ul style="list-style-type: none"> • Treat, neuter, vaccinate, tag (TNVT) approach to control stray dog population and prevent rabies: • Treat: against internal and external parasites • Neuter: to reduce the dog population in a humane way • Vaccinate: against rabies • Tag: an ear tag with identification number for each dog 	<ul style="list-style-type: none"> • Ensure compliance with international guidelines to humane canine population management • Promotes the "One Health" approach • Contribute to rabies elimination under the vision of zero human deaths due to rabies by 2030 • Significant cost reduction in the long-term for rabies and hydatidosis 	<ul style="list-style-type: none"> • Requires sustained funding and political will • May face resistance from communities unfamiliar with TNVT • Logistics challenges in rural/remote areas 	<ul style="list-style-type: none"> • Moderate to high cost: Requires sustained funding for medical supplies, training and logistics • Feasibility: High in urban areas with existing veterinary infrastructure; lower in rural zones without access to services • Acceptability: Generally high among nongovernment organizations (NGOs) and international partners; may face scepticism from communities unfamiliar with the method • Organizational factors: Requires inter-ministerial coordination, local government support and a centralized tracking system 	<ul style="list-style-type: none"> • Reduces health risks in underserved areas • Promotes equitable access to services 	<ul style="list-style-type: none"> • Ministry of Health and Social Protection • Ministry of Interior • Ministry of Agriculture, Maritime Fishing, Rural Development and Forestry • National Council of Veterinary Doctors • National Office of Food Safety
Education and awareness-raising involving the community	<ul style="list-style-type: none"> • Community education, school programmes, media campaigns, and licensing breeders: • Education programmes and workshops • Posters and flyers, game books for children • Behaviour change communication • Facilitating access to veterinary services • Licensing breeders and legislation • Involving NGOs and community leaders, as stakeholders, in education to change community's attitude 	<ul style="list-style-type: none"> • Increases use of veterinary services with greater access to canine population • Increases dog owners' involvement in the TNVT method • Promotes responsible ownership • Reduces dogs' abandonment, especially future puppies from unwanted litters 	<ul style="list-style-type: none"> • Difficult to measure short-term impact • Risk of misinformation or low engagement • May not reach illiterate or rural populations effectively 	<ul style="list-style-type: none"> • Low to moderate cost: Mainly involves content creation, media airtime and training educators • Feasibility: High, due to existing education and media networks • Acceptability: High across all sectors; aligns with public interest • Organizational factors: Requires collaboration between ministries, NGOs and media outlets; integration into school curricula may take time 	<ul style="list-style-type: none"> • Ensures inclusive outreach through schools, media and community leaders and empowers marginalized communities through education 	<ul style="list-style-type: none"> • Ministry of National Education, Preschool and Sports • National television channels and media • Private sector veterinarians

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Managing canine population	<ul style="list-style-type: none"> Demographic tracking, sanitation improvements and impounding stray dogs: Demographic and dynamic evaluation (sex ratio, mean age and life expectancy) using GPS trackers Improvement of infrastructure (sanitation of towns and villages through proper management of household waste, cleanliness of landfills and slaughterhouses) Impounding stray dogs 	<ul style="list-style-type: none"> Informs long-term strategy Supports infrastructure development Understanding the dynamics of dog populations will help determine which tools would be most effective and work over the long-term 	<ul style="list-style-type: none"> Infrastructure-dependent Risk of inhumane treatment if impounding is poorly regulated May be perceived as punitive by communities Data collection may be inconsistent 	<ul style="list-style-type: none"> High cost: Infrastructure upgrades (e.g. shelters, sanitation), staff training and data systems are expensive Feasibility: Moderate; more viable in cities with existing facilities Acceptability: Mixed; may be seen as punitive or ineffective if not well communicated Organizational factors: Requires strong oversight, legal frameworks and consistent data collection 	<ul style="list-style-type: none"> Helps target high-risk zones Improves sanitation in poor areas 	<ul style="list-style-type: none"> Ministry of Interior General Directorate for Territorial Collectivities
Partnering with the private sector	<ul style="list-style-type: none"> Involving private veterinarians, NGOs and outsourcing services: Involve private veterinarians Collaborate with animal protection associations Delegate the cleaning of ponds, landfills and slaughterhouses to the private sector 	<ul style="list-style-type: none"> Facilitates herd immunity Efficient service delivery Scalable: involving the private sector veterinarians is a key step to facilitating the vaccination process, aiming to achieve herd immunity 	<ul style="list-style-type: none"> Risk of profit-driven motives overriding animal welfare Potential lack of accountability May exclude small or rural providers 	<ul style="list-style-type: none"> Moderate cost: Involves contracting, monitoring and digital platform development Feasibility: Moderate; depends on legal clarity and private sector capacity Acceptability: High among NGOs and businesses; may raise concerns about profit motives Organizational factors: Requires clear roles, accountability mechanisms and incentives for participation 	<ul style="list-style-type: none"> Expands access to veterinary services in remote or underserved regions 	<ul style="list-style-type: none"> NGOs Private-sector veterinarians Cleaning companies