Street Dog Sterilisation Programmes

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Humane Society International (HSI) facilitates dog sterilisation programmes internationally, which includes population surveys of street dogs to gain basic demographic information and to set a baseline for future monitoring operations. HSI has developed a web and mobile application suite called ‘HSIApps’ with custom tailored workflows to improve the efficiency (lower programmatic cost) and improve the welfare of dogs in care throughout the sterilisation process.

street dog spay/neuter rabies dog welfare Sterilisation

1. Free Roaming Dogs

Dogs living on the street without immediate human supervision are known as free-roaming [1]. This definition includes owned dogs that are allowed to roam for prolonged periods, owned dogs that live on the street, and true street dogs. A street dog can be defined as one that is born on the street, survives on the street, and successfully produces progeny there [2]. India has a substantial free-roaming dog population, the majority of which are street dogs. There are an estimated 75.9 million dogs (55 dogs per 1000 humans) in India, both owned and unowned, 62.1 million (45 dogs per 1000 humans) street dogs, and 13.9 million (10 dogs per 1000 humans) owned dogs [3].

Street dogs live in harsh conditions with little to no veterinary care and are always at a high risk of road accidents. Street dogs are also under threat from various parasitic infections and zoonotic diseases, many of which represent a human public health concern, such as rabies. Together, these factors contribute to street dogs having a short average life expectancy in comparison to owned nonroaming dogs. Studies conducted on street dogs in India found that only 18% of pups survive a year [4], and that the average lifespan for a spayed female street dog is only 3.8 years [5]. Indian street dogs have one specific breeding cycle (monoestrous) beginning during the post-monsoon season from August to December, with peak pup ratios occurring in the following months (January to March). Street dogs are successful breeders and maintain the population at the carrying capacity unless decisive, significant intervention interrupts them. Indeed, the proportion of female street dogs becoming pregnant is estimated at approximately 47.5% in any given year [5], and models show that populations may persist at carrying capacity even despite low proportions of sterilisation and/or euthanasia intervention [6].

Street dog survival is largely dependent on direct or indirect food provisioning from people [7][8][9], who may provision regularly according to religious beliefs or out of kindness; feeding street dogs is culturally a routine

practice in India for many households. According to HSI household surveys across India, between 58% and 95% of households feed street dogs, with frequency ranging from daily to once a month.

2. Importance of Successful Sterilisation Programmes

Sterilisation programmes are an effective tool for controlling street dog populations. High densities of free roaming or street dogs increases the risk of human dog bites, zoonotic disease transmission, and poorer animal welfare for both domestic and wild animals [10].

Although there are more than 300 possible zoonoses that dogs can transmit to humans [11], the rabies virus is perhaps of highest concern. Rabies is endemic to India, with an estimated 18,000–20,000 cases in humans per year. A large portion of these cases are attributable to the more than 17.4 million annual dog bites in India; dogs represent the primary reservoir of the virus and are the source of more than 99% of all human rabies cases [12]. Other notable canine-borne diseases that affect humans include visceral leishmaniasis, echinococcosis, and toxocariasis [11].

Coexistence issues between local wildlife and domestic dog populations also arise when free-roaming dog populations are not controlled. Domestic dogs can transmit pathogens to wildlife populations that may be more susceptible to infection. For example, the rabies virus has been transmitted to endangered wild canids in Africa, such as the Ethiopian wolf [13] and the African wild dog [14]. A recent report showed that populations of the endangered Asiatic wild dog, or dhole, of India have also been infected with rabies [15]. Beyond disease transmission, domestic dogs can prey on wildlife or compete for local resources [16]. In the case of other canine species, free-roaming domestic dogs can lead to hybridisation [17].

Welfare of the domestic dog populations themselves is also a central driver for the implementation of management programmes. Conflict with humans due to excessive population density in urban areas puts street dogs under threat of removal, relocation, injury, and death from local people and authorities. The welfare of street dogs is mostly ignored in developing countries often due to a lack of animal protection laws, awareness of existing laws if laws do exist, and poor legal implementation. In India, the Animal Birth Control Rules of 2001 (ABC Rules 2001) is a specific law that provides legal protection to street dogs against relocation, removal, killing, and poisoning [18]. ABC Rules 2001 suggest that the only humane way to manage street dog populations is by adopting a “catch, sterilise, vaccinate, and return” method for population control. The Prevention of Cruelty to Animals act of 1960 also provides legal protection to animals in India from any type of cruelty [19].

Sterilisation is currently the most effective humane method available for controlling street dog populations when conducted in a systematic way. [20]. The same can be said for canine rabies vaccination programmes. Other more inhumane methods (killing, poisoning, and relocation) of controlling street dogs have proven less effective at managing dog populations and may even introduce rabies to new areas [21][22]. Street dog sterilisation programmes help improve the health and welfare of street dogs and reduce juvenile mortality by reducing breeding [23], and they

may also reduce human dog-bite injuries by acting to remove cause for maternal protective behaviours and by reducing roaming dog density [24].

3. Barriers to Successful Dog Population Management (DPM) Programmes in India

Under the ABC Rules 2001, local government authorities interested in controlling local dog populations often contract with animal welfare organisations to implement sterilisation and vaccination programmes, with funding and under supervision of the local authority. Several municipal corporations and local urban authorities in India have implemented street dog sterilisation programmes in the last two decades, employing the 'catch, neuter, vaccinate, and return' (CNVR) method. However, the majority of programmes have been conducted non-systematically, without baseline assessment of the local dog population, and without estimation or understanding of the intervention scale required to interrupt the replacement rate of street dog populations, or the fertility rate required by female dogs to maintain the population. Such programmes often result in little to no noticeable changes in the dog population, from a size and/or welfare perspective. As a result, funding is often withdrawn given the lack of perceived or real impact, and such programmes may be criticised publicly in the media. While a 70% sterilisation rate is often proposed as a necessary threshold for effective dog population reduction (e.g., news article—Times of India), this is neither supported by theoretical models nor actual data, and support for this figure cannot be found in the literature. Instead, it may be that the sterilisation of more than 83% of fertile female dogs is critical to successfully interrupt the breeding cycle of the population and noticeably reduce the population [25]. Furthermore, the sterilisation of both male and female dogs with limited resources and infrastructure may increase the overall length of the programme. Prioritising females or only focusing on female dog sterilisation is the most cost-effective method and reduces the necessary duration of the programme [26]. This is supported by the female-centric Animal Birth Control programme guidelines presented by the Animal Welfare Board of India [27]. Sterilisation programmes are only effective if conducted systematically, covering small areas one after another and ensuring that the sterilisation rates for each area and collectively across a geographic area are very high (above 83%) and consistently maintained [27].

From an operational perspective, a street dog population management programme in India typically begins with the physical capture of dogs. This generally occurs during early morning hours to avoid human and traffic movement. A dog-catching team records basic details and the location or address of the caught dogs on paper, but it can be difficult to describe a specific location without technological assistance such as GPS. Once 10 to 15 street dogs (depending on the size and type of catching vehicle used) are caught, they are transported to the programme's clinic location. Once at the clinic, dogs are generally unloaded, receive a medical examination, and undergo surgery if healthy enough. While dogs are under anaesthesia, one of the ear tips is given a 'V' shape cut as a part of permanent identification. Dogs are housed in kennels for three nights post-operatively under observation to ensure their recovery. Additional data recorded during this process often also gets recorded and remains on paper, although some programmes may enter data into a Microsoft Excel sheet. A final check of the surgical wound is performed by a qualified veterinarian before the dog is returned to their location as detailed in the catcher's log. A

commonly encountered issue, however, is that the paper record is often not sufficient to ensure accurate return of dogs to their original locations where they were caught. The use of paper records also precludes any possible cross-verification for the programme management team to know if the dogs are indeed returned to the appropriate location.

Such programmes can also collect a variety of data throughout the sterilisation process including physical characteristics of the dog (sex, colour, weight, age group, female dog in heat, etc.), disease conditions, skin/ear/eye infection, surgery-related data (surgery length, pregnancy, conditions related to the uterus or testis, and postoperative complications), which can facilitate a better understanding of the local dog population, as well as strengthen the program.

Street dogs are territorial and live in specific areas, actively attacking and repelling extraterritorial dogs [28], thus maintaining territories and preserving locally available food resources. Poorly implemented street dog sterilisation programmes often fail to ensure that sterilised dogs are returned to the same territory they were retrieved from, typically due to poor record keeping in the form of paper-based data systems. However, in recent decades, smart phones have become commonplace, and phone-based applications are playing an increasingly important role in many sectors, including animal science and data collection. The integration of a free, easy-to-use smartphone-based application could greatly enhance the data collection and management of street dog sterilisation programmes.

A smart phone application-based data collection and analysis system provides digital forms of datasets which are essential in the modern world, to both evaluate efficiency and assess programme strengths and weaknesses. Humane Society International has been promoting humane methods of dog population control worldwide and working in India with local and state governments since 2012. In the last decade, HSI-India has implemented evidence-based and data-driven street dog sterilisation and anti-rabies vaccination programmes in several cities and states across India. HSI invested in technology and developed HSIApps, an innovative smart phone-based application and a web-based backend dashboard based on several years of ground experience of programme implementation. HSIApps passed several development stages and reached a stable stage where it could serve as a technology platform for implementing dog/cat sterilisation programmes anywhere globally in an efficient manner. It has been developed such that it can handle more than the typical amount of data generated by large-scale programmes without limitations. A sophisticated application with an online dashboard provides technology power to the programme managers and enables accurate data gathering, real-time monitoring, and accurate, GPS location-based report generation. The secondary data collected by HSIApps can be used to gain insight and knowledge about the street dog population.

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