



Enforcement and capacity building to combat illegal trade of Alexandrine Parakeets *Psittacula eupatria* (Linnaeus, 1766) in Odisha, India

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Abstract

Illegal wildlife trade poses a significant threat to global biodiversity, and the bird trade is a prominent contributor to this issue. India, particularly Odisha, has witnessed the illicit trade of Alexandrine Parakeets, a prized species in the pet trade. This research examines the enforcement efforts against illegal parakeet trading in Odisha, focusing on frontline forest staff's attitudes, knowledge, and experiences using a survey-based approach. The study identifies the socio-economic factors such as poor economic conditions and lack of education as major factors motivating local communities' participation and support for illegal wildlife trade activities, shedding light on the complexities of wildlife trafficking in the region. Findings highlight the importance of staff engagement and education in augmenting conservation efforts and enhancing the effectiveness of enforcement strategies aimed at curbing the illegal trade of Alexandrine Parakeets in Odisha, India. This approach can be implemented in other states of India also where the socio-economic factors are a significant factor contributing to illegal trading activities for biodiversity as awareness is the key factor driving change. The insights gained from this research could inform policy interventions and conservation initiatives.

Keywords: Frontline Forest Staff, Wildlife Trafficking, Capacity Building, Socio-economic factors, Staff engagement and education, Staff Training

Introduction

Wildlife trade is a lucrative economic activity, with billions of living species and derivative products transported globally yearly (Jenkins, 2007; UNEP & Interpol, 2016). Unsustainable and/or illegal wildlife trade, on the other hand, may pose major threats to global biodiversity, particularly in African, Asian, and South American countries (Challender et al., 2015; UNEP, 2018), where the livelihoods of local communities reliant on those resources may be jeopardized (Traffic, 2008; Nijman, 2010). Furthermore, wildlife trading is a typical avenue for the introduction of invasive species, which have

negative implications on ecosystems, economic activity, and human wellbeing (Simberloff et al., 2013). The illegal trade in wild animals is the third-largest global trade, trailing only drugs and arms trafficking in terms of annual revenue (Barber-Meyer., 2010). India has been a major exporter of birds from the 1980s to the 1990s (Poonia et al., 2022). From 1975 to 2019, the total number of live birds exported was 212308, and live birds and their products were 315607 (Poonia et al., 2022). This trade has a substantial influence on one-third of all bird species worldwide, as well as many reptiles, amphibians, mammals, and fish (Rosen et al., 2010). Ancient tribes around the world have been documented to have caught, kept, and reared birds as pets as long as 4,000 years ago (Carrete & Tella., 2008), and the history of the bird trade dates back thousands of years as well. Birds have been kept by Indians since ancient times for their beauty, singing, and companionship, according to historical record analysis, and bird-keeping is deeply embedded in local customs and traditions (Carvalho, 1951; Cascudo, 1973). Parakeets in India are culturally cherished symbols of beauty, freedom, and love, featuring prominently in art, literature, and traditional practices.

Their high demand for exotic pets, driven by these cultural values, fuels illegal trade despite legal protections. Weak enforcement and significant financial incentives contribute to the persistence of this illegal market. The pet trade is a significant component of the wildlife trade (Auliya et al., 2016). Although accurate statistics on wild-caught traded animals are difficult to collect, it is believed that billions of wild animals are traded as pets globally each year (Smith et al., 2012), with illicit trade accounting for 25% of the global exotic pet trade (Karesh et al., 2007). Birds are one of the most widely trafficked taxonomic groups in the world, with over 4000 species of both wild-caught and captive-bred provenance sold and maintained as pets (Birdlife International., 2015). Overexploitation for food or cage bird trade is expected to endanger almost one-third (>400) of all globally threatened bird species (BirdLife International, 2008). Birds, which play an essential role in ecosystems as pollinators and ecological indicators (Bensizerara et al., 2013), are facing extinction rates that outpace their rates of diversification. Climate change, habitat loss, pollution, and the adverse effects of illegal commerce are mostly to blame for this alarming trend (Chandrakar., 2012). India has 1330 bird species, 100 of which are categorized as globally threatened (IUCN Red List., 2019). During the 1990s, 2-5 million birds were traded globally per year (BirdLife International, 2008); however, in 2017, over 49 million birds were kept as pets in European households (FEDIAF, 2018).

As the numbers of captive animals soar, so does the risk of their accidental or deliberate release into the wild. Thus pet trade is a conservation challenge also as a source of invasive species (Cardador et al., 2019). Although Alexandrine Parakeets are native to India however, the popularity of Parakeets in the pet trade can lead to issues if individuals are released or escape into the wild in non-native regions. Although the CITES trade database (CITES., 2021) is an important and easily accessible

source of data on international wildlife trafficking, it is limited to species listed in the CITES appendices (around 15% of bird species) and does not capture much unlawful trade. Market surveys can provide significant insights but are time and resource-consuming, and they are more likely to be limited to a particular region (Indraswari et al., 2020). The limitations of market surveys, such as high costs and regional focus, can hinder comprehensive data collection on illegal trade in Alexandrine Parakeets, impeding effective enforcement of protective laws. This can result in an inadequate understanding of the trade's scale and enforcement gaps. Seizable data can provide useful information not only on illegal trade (Rosen & Smith, 2010) but also on broader legal trade, because not all seizures include trafficking but may be the consequence of other rule infractions or administrative errors (Challender et al., 2022). Traders have utilized a variety of deception strategies to confuse buyers and law enforcement (Ahmed, 1999). To eliminate trade, it is necessary to change the attitudes of the locals. They are the impoverished society of our population, and they demand alternative livelihood measures to abandon this work (Ahmed., 1999).

The term "parakeet" refers to 115 species of the subfamily Psittacinae (family Psittacidae). Simply said, all parakeets are parrots, but not all parrots are parakeets. Parakeets are small, seed-eating parrots with long tapering tails that live all over the world, but are most common in the Indian subcontinent, Southeast Asia, the Pacific Islands, and tropical America. They are gregarious birds that travel in huge groups, but we are more familiar with them as caged birds and pets. They are included in Schedule II of the Wildlife (Protection) Act, 1972 in India. As a result, they are protected and cannot be captured, held in captivity, or sold. Enforcing the Wildlife (Protection) Act, of 1972, for Alexandrine Parakeets faces challenges due to complex illegal trade networks and insufficient resources and training for enforcement agencies. Limited public awareness and difficulties in distinguishing legal from illegal trade further complicate enforcement efforts. Effective enforcement requires enhanced coordination, better resources, and greater public education (Table 1).

Table 1. Description of four major Parakeet species found in India

SI.No.	Species	Scientific name	IUCN Status	Local distribution in India
1.	Vernal Hanging-parrot	<i>Loriculus vernalis</i>	Least concerned	Southwestern parts of India, occupy forests and shrublands
2.	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Least concerned	Found in forests, shrublands, grasslands, and wetlands throughout India.
3.	Alexandrine Parakeet	<i>Psittacula euphoria</i>	Near Threatened	Widespread throughout India. Occupies a range of habitats like forests, deserts, shrublands, and cultivated areas.
4.	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	Least concerned	Endemic to the Indian subcontinent, Plum-headed Parakeets are found in woodlands, parks, montane forests, tropical and subtropical forest areas, as well as agricultural fields.

Alexandrine parakeets *Psittacula eupatria* (Linnaeus, 1766) were upgraded from Least Concern to Near Threatened. The Alexandrine Parakeet *Psittacula eupatria* has an extensive range in Asia, stretching from Pakistan and the Himalayas through lowland South Asia and Myanmar to Indochina, but due to ongoing habitat destruction and unsustainable levels of poaching for the pet trade, the species has been elevated to IUCN status Near Threatened (BirdLife International, 2017). It is included in Appendix II of the Convention on International Trade in Endangered Species (CITES) and Schedule I of the Wildlife Protection Act, 1972 in India because of its popularity as a cagebird. Alexandrine Parakeet is further divided into five subspecies.

Material and methods

Study area

Odisha 20.940 N 84.803 E, situated in the eastern coastal belt of India within Southeast Asia, is renowned for its rich biodiversity. Odisha bears the severe impact of illegal wildlife trade, especially affecting songbirds and birds for aesthetic values due to the soaring market demand. Odisha's 30 districts are organized into three revenue divisions- Central, Northern, and Southern, each with its own challenges in enforcing wildlife protection laws. Central Odisha, including Khurda, faces significant illegal wildlife trade due to active markets in urban areas. Northern Odisha, including the vast, forested Mayurbhanj, struggles with monitoring and patrolling due to its remote and dense forests. Southern Odisha including districts like Ganjam, deals with smuggling issues because of its strategic coastal routes. Enforcing wildlife trade laws in larger districts like Mayurbhanj presents challenges due to its extensive, remote forests, making patrolling and monitoring difficult. In contrast, smaller districts like Jagatsinghpur, while easier to patrol, face issues like higher population density and urbanization, which increases demand for illegal wildlife. The larger area of Mayurbhanj requires more resources and strategic planning, whereas smaller districts need targeted enforcement to manage localized trade activities effectively. Each division's unique geography and economic activities necessitate tailored enforcement strategies to address the illegal trade and protect Alexandrine Parakeets effectively. Odisha's rich biodiversity, including diverse habitats for Alexandrine Parakeets, complicates efforts to control illegal wildlife trade due to the vast and varied ecosystems that are hard to monitor. The region's ecological value attracts illegal traders seeking exotic species, and the difficulty in patrolling extensive areas hampers effective enforcement. This makes it challenging to protect both the species and their critical habitats from exploitation.

Methodology

We conducted an official meeting with the frontline forest staff of Odisha as a part of our frontline forest staff training program for the active enforcement of illegal trading of Alexandrine Parakeets in Odisha (Fig 1). As it has been observed that the frontline forest staff are unaware of the procedure of confiscation in India, Parakeets were always treated as pet animals rather than wild, a semi-structured Questionnaire interview was conducted which included a set of questionnaires including both open and close-ended questions targeting to understand the level of awareness and the perspectives of the forest staff involved with working in the ground levels. This helped us assess the status of present-day and past actions being taken against the illegal trading of the Alexandrine parakeets. The questionnaire for frontline forest staff included questions on their familiarity with the WPA 1972, knowledge of Alexandrine Parakeet protection status, and identification skills. It also explored their perceptions of illegal trade reasons and market trends. This approach ensured a comprehensive assessment of their awareness and enforcement challenges. The Forest frontline staff included equal statistical representations including 2-3 forest staff members from each division and the concerned divisional forest officers recommended the names where the trades were high.

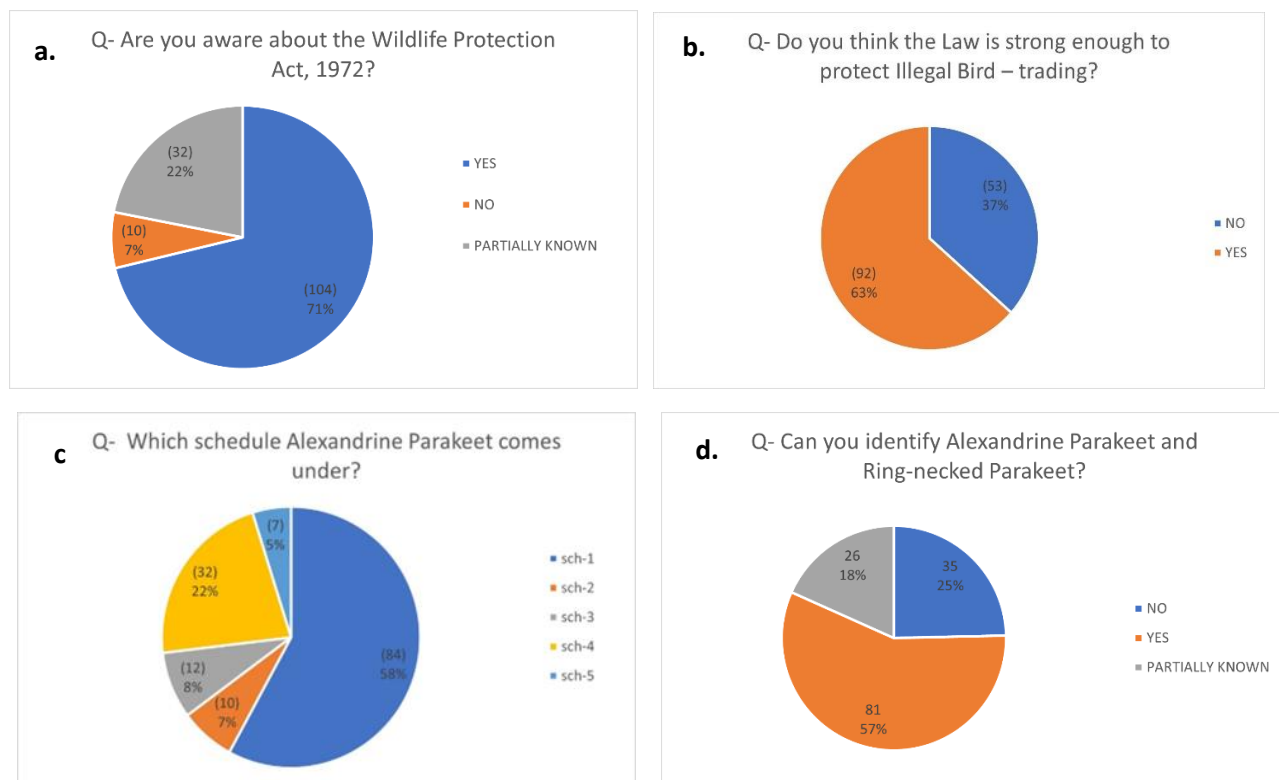


Fig 1. Capacity Building Training Programme for sensitization of Frontline Forest staff in Odisha

Results

In assessing the awareness levels of frontline forest staff regarding the Wildlife Protection Act (WPA,1972) India, a graph illuminates insightful perspectives. (Fig 2a.) showcases a predominant awareness among the surveyed staff, with 71% indicating a clear understanding of the WPA 1972. The survey assessed their knowledge of Specific provision since the wildlife protection act amendment was updated during 2024, Where some of the least concerned schedule species were lifted to schedule II of WPA with the increment of fine and imprisonment. This suggests a substantial grasp of the act's provisions, reflecting a commendable level of knowledge among a significant portion of frontline forest personnel and around 63% of respondents agree that the law is strong enough to prevent any illegal trading of birds (Fig 2b). However, the data also highlights potential gaps in awareness, with around 10% of respondents stating they are not aware of the WPA 1972 at all. This percentage signifies a notable portion of staff lacking foundational knowledge about this crucial legislative framework governing wildlife protection. Furthermore, a considerable 22% of frontline forest staff reported having partial knowledge of the WPA 1972. This subset acknowledges a degree of familiarity but falls short of possessing a comprehensive understanding of the act's intricacies and implications. It was seen that around half of the frontline staff are not aware of the Schedule status of Alexandrine Parakeet under the Wildlife Protection Act (Fig 2c.). This is a significant concern as almost half of the forest staff do not know the level of protection and actions to be taken for the species in Schedule II and overlook the illegal trade, considering it as less protected and often considering it as a pet species. Most of the forest staff can distinguish among the key distinguishing features between the Rose-ringed Parakeet and the Alexandrine Parakeet (Fig 2d.) However, there still tends to be a high ratio of staff unaware which poses a gap in this area. As suggested by the Forest ground staff the major possible reason for the illegal trading of Alexandrine Parakeets in Odisha remains the voice-mimicking quality of the bird (Fig 2e.) serving as a potential demand in the supply pet-trade market followed by pet-keeping in local households for high ornamental and aesthetic values which majorly attracts the children. The supply chain is severely affected by high demands of selective bird species in the market due to the fascinating mimicry and ornamental values of Alexandrine Parakeets which tend to attract children and pet owners from diverse age groups. Economic incentives and cultural factors significantly influence illegal trade. Economic motivations, such as profit from high-value and easily accessed species, drive individuals and networks to engage in illegal activities despite legal risks. Cultural factors, including traditional beliefs or practices involving certain species, can also perpetuate demand for illegal wildlife. A

comprehensive analysis should examine how these economic and cultural drivers impact illegal trade patterns and contribute to their persistence. Understanding these influences is crucial for designing targeted interventions that address both the financial and cultural motivations behind illegal trade. The illegal trafficking of wild animals managed under the CITES regulation is majorly not known (around 92% of responders) (Fig 2f.) by the forest staff of Odisha as being almost entirely unknown except for a few. According to the Frontline Forest staff (around 44% of the responder staff say that) (Fig 2g.) the demand for Alexandrine Parakeets in the market has not significantly increased over the years however a significant majority (around 25%) are unaware of the current demand and market trends associated with Alexandrine Parakeet. When asked about what population of the local community and people keeping Alexandrine Parakeets as pets the major answer was received as low (61%) followed by an average (30%) (Fig 2h.). However, when we consider our field enforcement activities and records obtained from the ground observation data it was seen to be high.



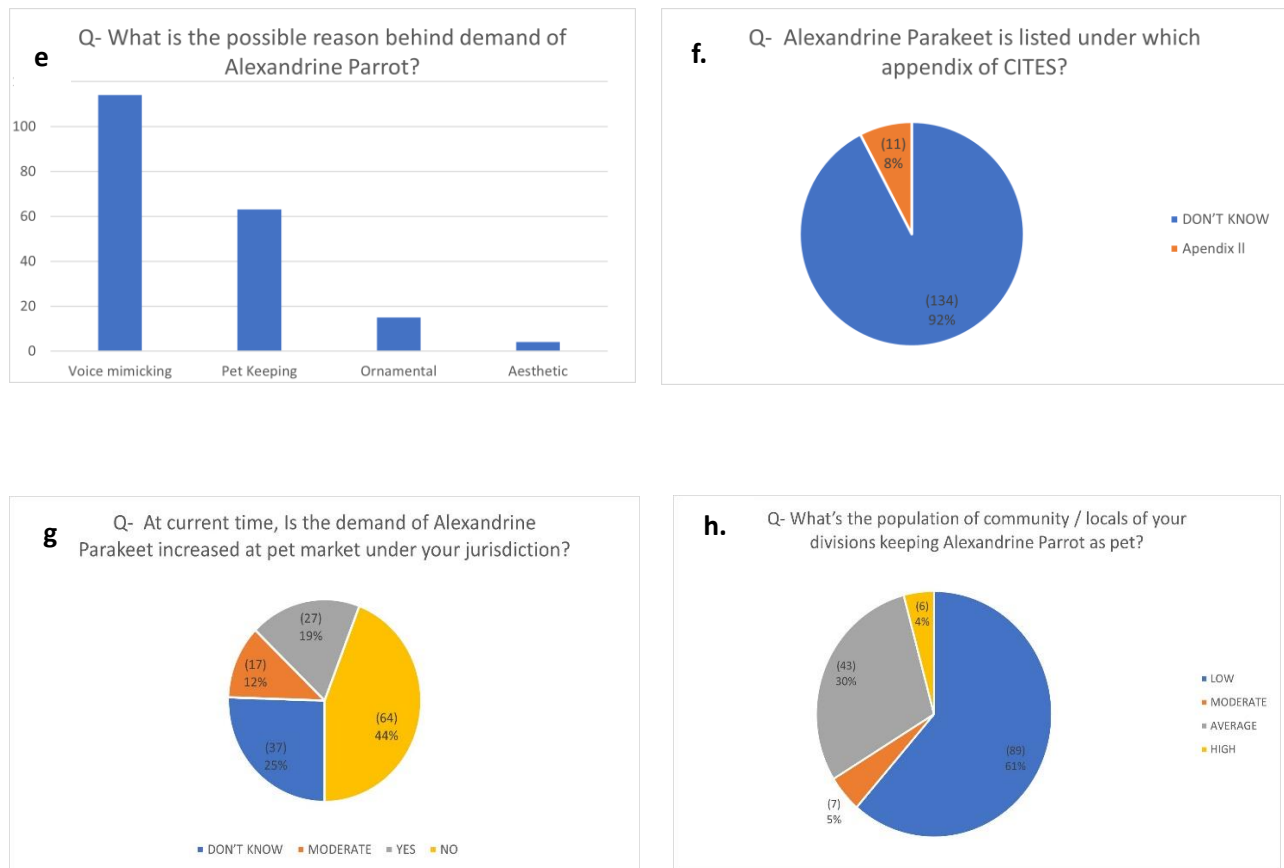
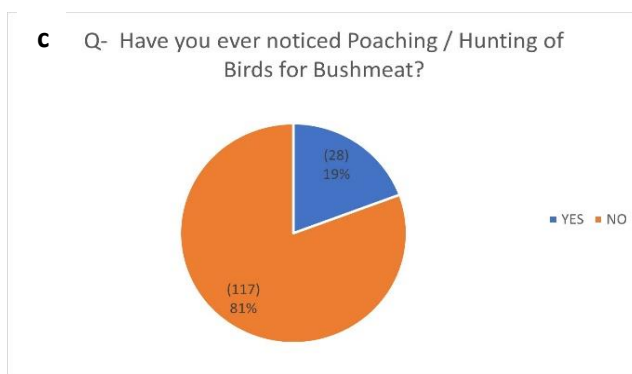
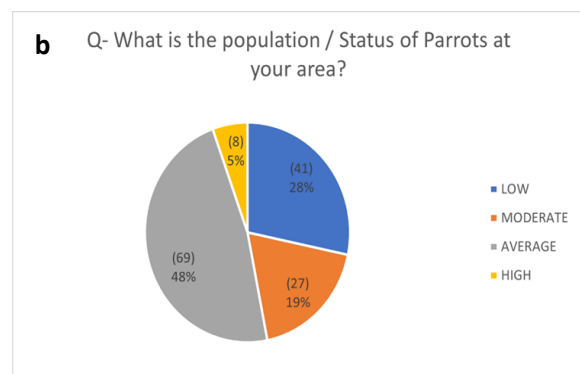
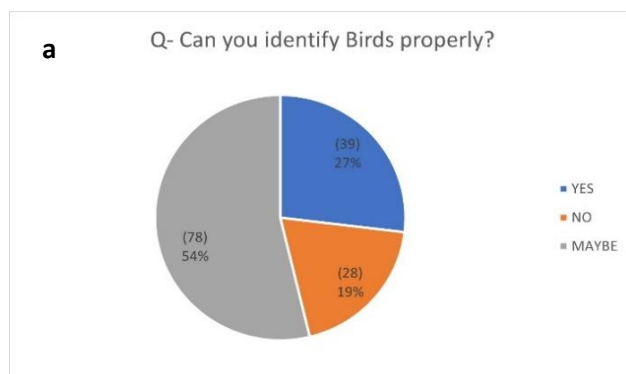


Figure 2 (a-h). Illustration of Frontline Forest Staff awareness towards illegal trading of Alexandrine parakeet in Odisha

Around 54% of respondents (Fig 3a.) said that they are unsure of their bird identification skills and only about 27% of respondents said that they can actually identify different kinds of bird species available in their region. The majority respond as the Population of parrots in their local area being on a scale of average (about 48% responders) to low (about 28% responders) (Fig 3b.) in number as per their observations. Around 81% (Fig 3c.) of the Frontline forest staff have never seen or noticed any case of Poaching or hunting of Birds for Bush meat. A majority of Questions were asked during the survey regarding the general awareness and training programs being held in their circle which ought to receive a heavily unsatisfactory response (98%) (Fig 3 d.) from the frontline forest staff who have never been exposed to any training programs related to combating Illegal bird trade in their area and a major group (around 82%) (Fig 3e.) has never been involved in conducting any enforcement on illegal pet trading across their Jurisdiction. To address the training gap, authorities should implement comprehensive training programs focusing on illegal bird trade, including identification, investigation techniques, and legal procedures. Offering workshops, online courses, and partnerships with wildlife experts can enhance frontline staff capabilities. Evaluations often show that trained staff are more effective in enforcing regulations and disrupting illegal trade compared to those without

training. Ensuring ongoing education and support for frontline personnel can further improve enforcement outcomes. When asked the responders (18% saying that they have conducted enforcement) in what situation they have conducted enforcement (Fig 3f.) majority suggested that it was not specific with no data available (41 %) followed by enforcement done on roadside (27%) and open market (about 18%). As seen from the responders (approximately 90%) (Fig 3g.) suggests that there are currently no Bird aviary or Enclosures in their division which could be either used for rescue or soft release purposes. Establishing bird aviaries faces financial constraints, a lack of technical expertise, and space limitations. Overcoming these barriers involves securing funding through grants and partnerships, consulting wildlife experts for design, and exploring alternative land use options. Collaboration with NGOs and local communities can also aid in addressing these challenges. When the forest staff was asked about their prior awareness or any experience with a soft release or hard release and techniques involved in these methods a majority (about 83 %) (Fig 3h.) were unaware of these two release techniques.



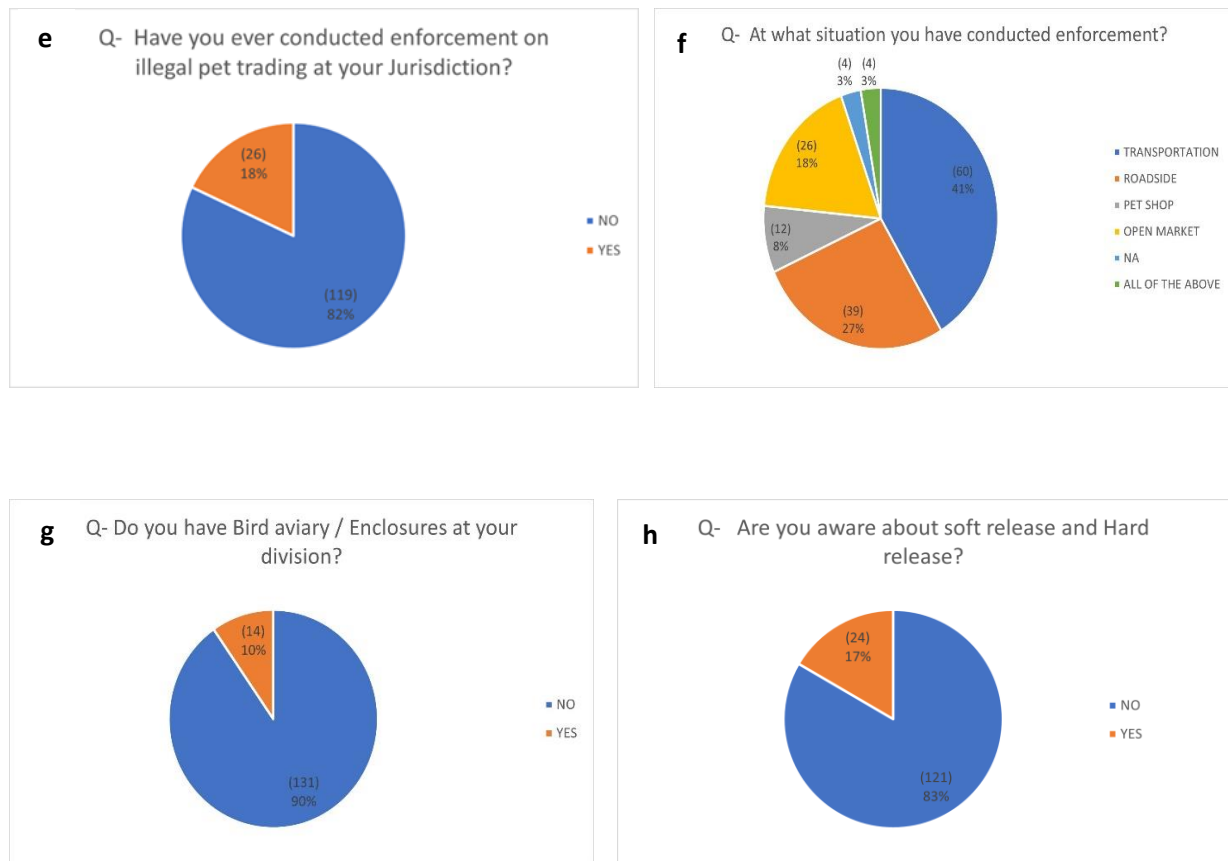


Figure 3(a-h). Demonstration of general perspective and awareness of Forest frontline staff

Discussion

Illegal trading activities within Odisha pose a critical threat to existing bird populations and ecological balance. The illegal bird trade operates within a complex and often clandestine demand and supply chain, driven by a global demand for exotic birds as pets, for cultural practices, and for their perceived medicinal or status-related values. In Odisha, frontline staff face challenges such as dealing with sophisticated smuggling networks, limited resources, and corruption. Coordination issues and community relations further complicate enforcement efforts, making it difficult to disrupt these illegal trades effectively. The chain starts with poachers or illegal trappers who capture birds from their natural habitats, often employing cruel and destructive methods. These captured birds then enter a network of middlemen who facilitate transportation, hiding, and distribution across borders, using various means to evade detection. The demand side involves consumers, pet markets, collectors, and traders seeking rare or exotic species. This demand perpetuates the cycle, fueling the illegal supply chain. The trade poses a severe threat to bird populations, leading to habitat destruction, species endangerment, and ecological imbalances. Addressing this intricate chain requires a multi-faceted approach, including stricter enforcement, international cooperation, public awareness, and community involvement to curb the demand and dismantle the supply networks. This often targets

species with ornamental or mimicry values, driving demand for their unique appearances or ability to mimic sounds. Speech signals are natural, efficient, and the most desirable mode of communication among humans and animals being composed of a sequence of small units of sound called phonemes. Birds also use sounds to communicate as it is advantageous under low light, long distances, and dense obstructions to stay in touch with their flock members. Birds have more evolutionary experience as compared to human beings as they came before us on the earth about 60 million years ago (Singh et al., 2009). Every species of bird is associated with unique calls and songs. However, this has become a significant cause of trading pressure on species, leading some of them to the brink of extinction.

Birds prized for ornamental purposes, like vibrant plumage or distinctive features, are sought after in the pet trade and for collection purposes, fueling their illegal capture and trade. Similarly, species valued for their ability to mimic human speech or sounds are in high demand for entertainment and cultural practices. This demand results in targeted poaching and trafficking, threatening populations of parrots, mynas, and other vocal species. This specific targeting exacerbates the risk of extinction for these birds and disrupts the delicate balance of ecosystems. Combating this aspect of the illegal trade necessitates targeted conservation efforts, stricter regulations on pet markets, public education on ethical ownership, and sustainable alternatives to satisfy the demand for ornamental and mimicry values without endangering these species in the wild, for example, Community outreach programs, school education initiatives for the youth, and media campaigns focusing on wildlife conservation carried by various NGO's in India have been found to be effective. There remains a high demand pressure on selective species having mimicry and ornamental values. This puts a significant threat of extinction to selective species target groups which may go extinct earlier than others.

One of the primary challenges hindering effective enforcement against these activities is the limited understanding and awareness among the Frontline Forest staff. The training programs should include theoretical and also more practical modules that focus on inculcating Identification skills, and legal frameworks and demonstrating advanced surveillance techniques. The Frontline Forest staff, despite their dedication, face challenges due to their limited comprehension of the complexities surrounding illegal trading. The intricacies of illegal wildlife poaching, logging, and trade routes often evade their understanding. This knowledge gap hampers their ability to identify, intervene, and prevent these illicit activities effectively, while a significant portion of frontline forest staff exhibit a commendable understanding of the Wildlife Protection Act of 1972, there exists a pertinent need to address the pockets of limited or partial awareness. This calls for proactive measures to ensure comprehensive knowledge dissemination, empowering these stewards of the forest to better preserve and protect India's rich biodiversity in line with the provisions of the WPA 1972. As observed, the overall level of understanding and awareness amongst the Frontline Forest staff remains low which is a significant

concern posing a barrier towards active enforcement of illegal trading activities within Odisha. Compounding this issue is the staff's limited awareness of the true extent and impact of illegal trading activities within Odisha. Inadequate resources in the form of a shortage of technical expertise or skills and funding support for monitoring and a dearth of comprehensive training programs contribute to this lack of awareness. Without a clear grasp of the magnitude of the problem, their enforcement efforts remain suboptimal. The combination of insufficient understanding and awareness acts as a significant barrier to proactive enforcement measures. The inability to recognize the signs of illegal trading, identify key players involved, and understand the methods employed creates loopholes that perpetrators exploit. Consequently, despite their dedication, the Frontline Forest staff struggle to curb these illegal activities effectively. The consequences of unchecked illegal trading activities reverberate across ecosystems. The depletion of wildlife populations, the destruction of habitats, and the disruption of ecological balance are immediate concerns.

Additionally, these activities have broader socio-economic implications, impacting local communities reliant on these natural resources for their livelihoods by depleting natural resources, damaging ecosystems, and contributing to the loss of tourism revenue. This illegal activity also perpetuates poverty by disrupting sustainable livelihoods and local economies. Alternative livelihood programs include community-based eco-tourism and sustainable agriculture initiatives thus reducing the reliance on illegal trading activities. It has been proven effective in integrating conservation with local economic benefits, enhancing both environmental and community resilience. To address this pressing issue, a multifaceted approach is essential, focusing on short-term goals like developing small projects focusing on creating awareness and mass participation, whereas long-term goals should focus on sustainable economic development through stakeholder engagement and creating or enhancing livelihood opportunities. Robust training programs focusing on the nuances of illegal trading, updated methodologies employed by perpetrators, and strategies for effective intervention are imperative. Improved access to information, modern surveillance techniques, and collaborations with local communities can augment the staff's understanding and awareness. In conclusion, the low level of understanding and awareness among Frontline Forest staff in Odisha presents a critical challenge in combating illegal trading activities.

It is imperative to bridge this knowledge gap through comprehensive training, enhanced resources, and community involvement. Only by empowering these dedicated individuals can we fortify their capacity to protect the forests and wildlife of Odisha from the threats posed by illegal trading activities. Training for Frontline Forest staff is of paramount importance in safeguarding our avian biodiversity in natural ecosystems. These individuals serve as the guardians of our forests, facing the daunting challenge of combating illegal activities like wildlife poaching and illegal logging. Adequate

training is required to equip them with essential skills and knowledge crucial for effective enforcement. To enhance their awareness of the complexities surrounding illegal trading, it is needed to enable them to recognize signs of illicit activities and understand the laws governing forest protection. Moreover, training programs are needed to keep them updated on evolving tactics used by perpetrators, allowing for adaptive and more efficient strategies. The dire need for Engaging in community-focused modules fostering collaboration between staff and local communities is required in Odisha, strengthening conservation efforts. Furthermore, properly trained staff are not only better equipped to enforce laws. Trained ground forest staff can effectively contribute to sustainable resource management practices, ensuring the long-term health of our forests and biodiversity. Ultimately, investing in the training of Frontline Forest staff is an investment in the preservation of our natural heritage for generations to come.

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