

# DEVELOPING A SUCCESSFUL FORENSIC MONITORING SYSTEM TO COUNTER POISONING OF WILDLIFE AND THE ENVIRONMENT IN KENYA

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## SUMMARY OF KEY ISSUES

Kenya's emblematic biodiversity is integral to its ecosystems, the tourism sector and - in the case of pollinators and natural pest controllers - to its agriculture. The absence of vultures (and key insect species) serves as one of the primary indicators that poison is present within an ecosystem. Intentional/retaliatory poisoning has long been a reality due to human-wildlife conflict. The practice of 'pesticide hunting' in rice fields and 'pesticide fishing' in water bodies and use of poisons to capture wildlife (esp. vultures) for 'medicinal' purposes are also of concern as insidious - but as yet undocumented - threats to human health. The current lack of a wildlife forensic system and the existence and ongoing emergence of counterfeit products further complicates vital poison identification, monitoring and mitigation efforts. Maintaining the integrity of ecosystems and protecting biodiversity must be firmly linked with economic prosperity, a thriving agriculture sector and human health. Spain, like Kenya, has a long history of human-wildlife conflict and poaching/illegal poisoning as well as hosting several important vulture populations. Since 2000, the country has operated a nationwide anti-poisoning strategy, launched to reduce the incidence of wildlife poisoning and increase prosecution of infractions. The highly successful partner initiative in southern Spain - which includes a dedicated wildlife forensic laboratory, a specially trained fleet of scouts and rangers, and extensive educational outreach - has resulted in a roughly 50% decrease in overall poisoning incidents in less than ten years. Here we consider elements that have been implemented in Spain and how they could realistically be applied to ensure success in the Kenyan context.



### Components of the successful approach in Spain

- Knowledge of poisons in use and their provenance (e.g. black market), species targeted using each type/class of compound
- Timely discovery and recovery of evidence from the wild
- Rigorous forensic investigation procedures + protocols
- Multiple laboratory analyses, dedicated facilities/equipment
- A fleet of specially trained poison detection dogs and agents
- Prosecutions/fines = punishment and closure of cases
- Education of poachers = prevention, reduction of poisoning
- Education of judges and relevant public officials/legal authorities

### What has been developed in Kenya?

- Networking between conservationists on the ground and analysts in laboratories
- Partnership with charities that gift refurbished instruments, consumables, support
- Sampling, storage and transportation protocols - but still require materials + testing
- Capacity to screen wildlife samples (methods currently being developed and validated)

## Recommendations for moving forward on wildlife poisoning monitoring

- Kenya must be part of global anti-poisoning network
- Vigilance and monitoring - ongoing identification of poisons/emerging threats + conflicts, training rangers and scouts in sampling methods
- Sampling, storage, transportation protocols - tested and validated
- Multi-screening methods developed to capture ambient environmental levels from current and prior agricultural use and poison threats
- Punitive approach impractical: resolution of human-wildlife conflicts, repercussions to human health must be ingrained
- Preventive education of poachers, public, relevant officials: - change in beliefs will be cornerstone of success in Kenya
- Mitigation of pesticide hunting/fishing (alternative livelihood schemes)
- Human health studies conducted in parallel to quantify and mitigate risks
- Ongoing efforts to close gap between analytical/ environmental chemists, industry, conservation and human health realms
- Research partnerships: joint funding must be secured + opportunities for collaboration

### Analytical resources available in Kenya

- GC-MS Laboratory of Excellence (JKUAT)
- HPLC facilities
- Mi-Vac rotary vacuum evaporator/sample condenser (efficient sample prep)
- GC-HPLC currently sought

### Research pathways

- Deliberate poisoning is a persistent problem in Kenya BUT baseline environmental levels must also be considered
- Extensive environmental monitoring has been conducted and good data on pesticide residues (behaviour and fate) in aquatic, terrestrial and agricultural systems of Kenya is available

### Priorities

- Identification of current and emerging poisons, poisoning practices and target species
- Consolidation of documented threats to wildlife/insect pollinators in Kenya
- Determination of metabolism and toxicity to non-target organisms, including people

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