Final Evaluation Report

Your Details	
Full Name	Kumudani Bala Gautam
Project Title	Leveraging community and technology to combat illegal trade of Bengal Monitor lizard in Terai Arc, India
Application ID	37676-1
Date of this Report	08 Jan 2025

1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Establishing a baseline geo- referenced genetic database from wild population of V. <i>bengalensis</i> through field work			Yes	The geo-reference database is generated through 3 mitochondrial genes (Cyt b, ND5 and COI) and six microsatellite gene.
Sensitization of local communities and NGOs about the ecological and economic significance and conservation status of V. bengalensis in TAL			Yes	Questionnaire surveys are completed and workshops were also conducted properly with positive outcomes, the only activity which was not satisfactory was the investigative surveys of tribe, people tend not to engage in any kind of dialogue.
Training of Forest Department staff for biological sample collection, ecology and scientific identification and monitoring of V. bengalensis in TAL			Yes	Training of forest department is carried throughout the sampling points. All the respective pictures are attached in the elaborative report.

2. Describe the three most important outcomes of your project.

a). We generated a baseline genetic database from Terai Arc Landscape consisting both mitochondrial and microsatellite genes and compared those with the confiscated body part derivatives (Hemipenes, claws, skin etc.). The outcome suggested the existence of two distinct lineages within Bengal Monitor Lizard which shows divergence between them at around 3.06 mya and hence categorised as Evolutionary Significant Units (ESUs); namely Himalayan foothills lineage and Remainder of Mainland lineage. Additional major confiscation were clustered with the mainland lineage suggesting more pressure on the region in comparison to the Himalayan lineage.

b). The molecular database is available on public platform NCBI. The enforcement agencies and scientific authorities can now utilise the same to identify the lineage being poached and access the origin of the traded body part of Bengal monitor.

c). Local narrative explained reasons for myths and misconceptions. The training among the stakeholders i.e. forest officials, custom officers, NGOs, Local schools and colleges has created a sense of responsibility and encouraged the government officials to utilised our molecular database to pinpoint poaching areas for curbing illicit activities on ground.

3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

The project was originally planned to last one year, but it ultimately took two years to complete all the tasks. The primary reason for the delay was the lack of cooperation from the local community. Engaging with local traders about "Hatha Jodi" proved to be a challenging endeavour. The tribal communities in the area often live in makeshift houses, enabling them to frequently relocate. Identifying individuals involved in trading, poaching, or hunting was particularly difficult, as they were apprehensive about being exposed to authorities and would often disappear from locations where I initially encountered them.

To address this challenge, I decided not to seek assistance from the forest department and instead approached the community solely as a student to build trust and facilitate communication.

4. Describe the involvement of local communities and how they have benefitted from the project.

The success of this study would not have been possible without the invaluable support of the local communities in the areas I visited. Members of the local community were engaged as field assistants, and forest staff from certain ranges, many of whom were locals, played a key role in helping locate Bengal monitor lizard burrows. Additionally, village leaders, or 'Sarpanch,' were instrumental in several villages, helping gather residents for awareness programs and fostering community participation. The involvement of local school teachers was particularly noteworthy. Their interest in the subject and commitment to educating children about wildlife enabled us to organize numerous drawing competitions and awareness campaigns. Engaging with village children proved to be a vital outreach strategy, as their participation helped us connect with their parents. Parents trusted the information coming through schools and were more open to learning about ecological topics.

This approach had an unexpected yet positive outcome—parents became more inclined to encourage their children to pursue studies in science and consider careers in wildlife and environmental conservation. This ripple effect highlights the potential for long-term benefits stemming from such community-focused initiatives.

Field assistants were provided with a daily allowance of INR 500 (approximately 5 GBP) for their contributions and efforts. While this amount was nominal considering their years of skill and experience, it served as a meaningful support for our field staff and assistants, particularly when considering the economic challenges, they often face. As part of a larger national effort towards a protected animal under Wildlife Protection (Amendment) Act 2022, their skills and experience were acknowledged and appreciated, making them feel valued. This project sparked local interest in the

species, fostering greater awareness, vigilance, and monitoring of its movements. It brought attention to a species often overlooked and misunderstood, despite its presence in their everyday surroundings.

5. Are there any plans to continue this work?

The primary focus of this study was to establish a baseline geo-referenced database to assist enforcement agencies in identifying the origins of confiscated derivatives while simultaneously raising awareness among local communities and ground forest staff about the ecological significance of the Bengal Monitor Lizard. The Terai Arc Landscape- study area of this project represents a microcosm of the Indian subcontinent. Building on these findings, I aim to expand this work to include all extant monitor lizard species across other landscapes in collaboration with enforcement agencies and various stakeholders. This broader approach will enhance conservation efforts and strengthen the fight against illegal wildlife trade nationwide.

6. How do you plan to share the results of your work with others?

- I. <u>Final Report Submission</u>: A comprehensive final report will be prepared in accordance with the compliance points outlined by the Ministry of Environment, Forest and Climate Change (MoEFCC) in the permission letter for the sampling of Schedule-I animals under the Wildlife Protection (Amendment) Act, 2022. This report will also be shared with the forest departments of the respective states within the Terai Arc Landscape.
- II. <u>Scientific Publications</u>: The molecular findings from this project have been integrated into the Ph.D. thesis of the Principal Investigator (PI). These results will be published in reputable peer-reviewed journals to ensure they reach a wider scientific and academic audience.
- III. <u>Conference Presentations</u>: As part of the Ph.D. requirements, the findings have already been presented to scientists, researchers, and nature enthusiasts at the 10th World Congress of Herpetology (2024), ensuring international exposure and engagement.
- IV. <u>Collaboration with IUCN SSC Monitor Lizard Specialist Group</u>: The results will be shared with the IUCN SSC Monitor Lizard Group, where the PI has been recently appointed as the Regional Chair for South Asia. This platform will facilitate the dissemination of findings to a global network of experts, contributing to the species' conservation efforts.
- V. <u>Public Outreach</u>: Efforts will be made to report the findings through media outlets such as national newspapers and science magazines to raise awareness among the local population and engage a wider audience in conservation initiatives.

This multi-tiered dissemination strategy ensures that the project's outcomes will reach policymakers, scientists, conservationists, and the general public, fostering both academic and practical advancements in the conservation of monitor lizards.

7. Looking ahead, what do you feel are the important next steps?

The Wildlife Institute of India has initiated the process of matching wildlife seizures with the reference database, providing reports that identify the lineage of poached monitor lizards. This progress highlights the need to explore other unstudied landscapes in India. The methodology employed in the Terai Arc Landscape can be replicated in other landscape too to better understand the molecular structure within the monitor lizard populations present in India and leverage this data to develop more effective conservation management plans. In addition to the Bengal Monitor Lizard, the other three extant species in India—Yellow Monitor, Water Monitor, and Desert Monitor does require focused studies. A deeper understanding of their population dynamics and trade patterns is essential to comprehensively address the national and international illegal trade continuum for monitor lizards. These efforts will strengthen conservation strategies for all four species.

Continuous awareness programs targeting the younger generation are essential to foster an understanding of the ecological significance of these often-exploited and overlooked species. Introducing them to the value of monitor lizards through educational initiatives can help build a foundation for long-term conservation efforts. Furthermore, supporting the IUCN SSC Monitor Lizard Group with baseline data on Bengal Monitor Lizard populations is crucial. This data can inform and influence policy reforms and management action plans, ensuring more effective conservation measures are implemented globally.

8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?

Yes, The Rufford Foundation logo was used in all the posters and pamphlets distributed during the field study and awareness programmes, to forest department staff, department offices, among local communities (also distributed to visiting school children) and NGOs. The t-shirts created for the promotional material also contains Rufford logo. Moreover, all the presentations, and banners used had the Rufford Foundation logo.

9. Provide a full list of all the members of your team and their role in the project.

Kumudani Bala Gautam: She was the lead investigator and this project is part of her PhD research. She was responsible for planning and coordinating field surveys and awareness programs in collaboration with forest officials and local communities. She also led the fieldwork, ensuring the successful execution of activities across the study sites. In addition, she conducted data analysis, interpreted the results following laboratory work, and played crucial role in finalising reports and scientific papers.

Dr. Bhim Singh: He played a pivotal role in the experimental laboratory work, specifically in standardizing PCR amplification using cross-species primers. These primers, originally designed for the Komodo dragon (*Varanus komodoensis*), were successfully adapted for use with the extant monitor lizard species of India. His foundational work in standardization significantly streamlined the process, enabling Kumudani to efficiently process all the collected samples.

Dr. Anukul Nath: He leads a project entitled 'Landscape scale assessment of population, habitat and genetics of Hispid Hare in India' funded by DST India. Project covers the Terai Arc Landscape and Northeast India, hence he has share his contacts and provided invaluable support in

stakeholder engagement. His assistance in establishing connections with regional officers and stakeholders greatly facilitated the smooth execution of the community awareness programs in these areas.

Dr. S. K. Gupta: He facilitated for the central facility at the Wildlife Institute of India for the smooth wet laboratory work for Kumudani.

10. Any other comments?

We extend our heartfelt gratitude to The Rufford Foundation for their generous grant, which enabled the team to work on the conservation of a heavily traded Schedule-I species. The high level of trade in this species has also been a significant concern for the Ministry, as evidenced by their awareness efforts on platforms like X (formerly Twitter). The Rufford Small Grant not only facilitated this extensive study across a challenging landscape but also demonstrated an understanding of the limitations associated with engaging local communities in such a vast area. The flexibility and support provided by the funders were invaluable in overcoming these challenges and ensuring the success of the project. The outcome of this project is promising and we are committed to continue similar work across different landscape to have a pan-India perspective. We will be applying for the second stage to achieve the broader conservation goals. For a PhD student, the Rufford Small Grant serves as a critical ally and a life-saving resource, enabling meaningful research and impactful conservation work.