Final Evaluation Report

Your Details	
Full Name	Basant Sharma
Project Title	Bats and Caves: Seasonal Monitoring and Conservation in Kaligandaki Canyon, Nepal
Application ID	28290-2
Grant Amount	£5,000
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Date of this Report	19th August 2021

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
Monitor caves seasonal microclimatic condition				This project was massively hit by Covid-19. We had to postpone our work at the middle stage i.e., from April 2020. Although the project was supposed to be completed within a year, it took us 2 years. We completed four seasons of monitoring in October 2019, January 2020, April and July 2021.
Identify seasonal cave use pattern by bats				Bat monitoring in caves was also affected in the same way as cave monitoring.
Conduct bats and caves conservation activities				All conservation activities were conducted during April 2021. Despite Covid-19, all conservation activities such as installation of conservation boards on respective caves, donation of dustbins, cave management seminars, etc., were done successfully.

2. Please explain any unforeseen difficulties that arose during the project and how these were tackled.

The unforeseen difficulty during the project implementation phase was Covid-19 which led to restriction on travel and long lockdown. To tackle this situation, we postponed all our activities and resumed when time was favourable. Although it took more time than we expected, we achieved the project's main goals. Due to restrictions on large gatherings, we had to conduct two seminars dividing the participants: one in Kushma Parbat and another in Paang, Parbat. Likewise, restrictions on large gatherings also impacted cave cleaning as well as bat walking programmes. We limited the number of participants in both programmes.

3. Briefly describe the three most important outcomes of your project.

Firstly, we identified that bats use caves of kali Gandaki year-round except during the winter hibernation period. Caves are found to be used mainly for breeding and pup rearing. Bats arrive in caves when the temperature starts to rise and leave from caves when it starts to fall. This provides great opportunity to promote tourism e.g., frequent cave visitation in winter and limiting the visitor numbers or, if possible, restricting them during other periods.

Secondly, we identified that cave microclimatic conditions vary seasonally. We reported maximum carbon dioxide concentration of >9000 ppm in Gupteshore cave and >5000 ppm in Laleshore cave during summer and autumn seasons. This high concentration of carbon dioxide is unsafe for human beings. This suggests adopting visitor safety protocols during these periods, limiting cave visit time or, if possible, restricting visitation during these periods.

Thirdly, a cave and bat conservation seminar gathered representatives of different cave management groups. They were previously managing caves on their own without knowing their practices to promote tourism could lead to deterioration of the cave environment as well as loss of bat populations. Because of the seminar, now they are fully aware about the importance of bats and a healthy cave environment for the local ecosystem. After the seminar, they were committed to work as a unit and adopt bat and cave friendly management approaches in the future.

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

The cave management committee is the primary local stakeholder of this project. They are benefitted both from a scientific point of view as well as knowledge gain. Our seasonal cave and bat monitoring activities provided management groups with essential data on bats and cave microclimatic conditions for appropriate cave management practices in the future. The seminar filled them with knowledge on bats, caves and how they can be managed, saving natural components as well as promoting tourism. Donation of dustbins and installation of conservation boards aided a small portion of assistance to cover cave conservation expenses. In addition, such conservation boards also provided crucial knowledge to cave visitors regarding cave and bat conservation.

5. Are there any plans to continue this work?

Yes! There is still a lot to do for cave conservation in the Kaligandaki. As we have shared and distributed bat friendly cave management guidelines to management groups, at this moment, we are not sure how they are going to practice it. For the next phase, it will be better to cover effective implementation of guidelines or formulate action plans, etc.

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

We are a group of dedicated bat researchers from Nepal. We are highly motivated to write research papers and publication so the first priority will be to publish findings in peer-reviewed journals and make them available through online platforms. If we get any opportunity, we will also share findings via attending conferences, giving presentation talks, writing blogs, news articles, etc.

7. Timescale: Over what period was the grant used? How does this compare to the anticipated or actual length of the project?

Project started one season later than we anticipated because the arrival of equipment from foreign countries took longer than we expected. Grant was used from the very first stage to last. At the beginning, we brought equipment necessary for cave and bat monitoring but most of the project grant was used during 3rd monitoring phase in April 2021. Due to Covid-19, most of the activities were postponed so, in this phase, we resumed all incomplete conservation activities (including installation of conservation boards in respective caves and seminars) and spring monitoring which required more funds than other periods. As the delay period was nearly 1 year, we were in a little rush to complete a majority of project activities as we do not know what is going to happen next. Due to all these, there is a slight change in timescale and period than we anticipated.

8. Budget: Provide a breakdown of budgeted versus actual expenditure and the reasons for any differences. All figures should be in £ sterling, indicating the local exchange rate used. It is important that you retain the management accounts and all paid invoices relating to the project for at least 2 years as these may be required for inspection at our discretion.

Item	Budgeted Amount	Actual Amount	Difference	Comments
Transportation expenses (two way and in field for 4 monitoring phases)	260	260		
Equipment expenses (Co2 data loggers, Echometer Touch 2 Pro and field gears)	732	465	-267	Echometer Touch 2 Pro was donated from Idea Wild International, USA
Conservation program expenses (installation of conservation boards, cave cleaning, seminars, donation of conservation dustbins, etc.)	1355	1555	+200	Due to restriction on large gathering we had to conduct 2 seminars.
Field allowances	720	720		
Food and lodging expenses	1800	1800		
Communication expenses	60	60		
Miscellaneous expense	73	140	+67	Extra miscellaneous cost appeared due to Covid-19 for health safety of team and participants.
Total	**5000**	**5000**		

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

In terms of conservation perspective, the next step would be to implement sustainable cave management guidelines and formulate action plans. The cave management groups are now committed to manage caves in favour of bats so to implement such interventions would be a great approach.

As we know bats did not use caves during winter, this provides an opportunity to identify the location of their hibernation sites and check if such sites are safe from threats or not. It is also to be noted that bats in caves are multiple species, a maximum up to seven in a single cave system, and it is likely that they may prefer different caves as hibernation roosts. Cave exploration in peripheral regions, seasonal monitoring as well as use of tagging and tracking devices to understand bat movement ecology is highly recommended.

10. 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! We used the Rufford Foundation logo or, in some cases, name in every material we produced. We also acknowledged the foundation during seminars and other conservation programmes so; foundation received some level of publicity from this project.

11. Please provide a full list of all the members of your team and briefly what was their role in the project.

Yubraraj Sapkota, B.Sc. Agriculture Science, Institute of Agriculture and Animal Science, Tribhuvan University, Lamjung, Nepal
He assisted conducting seasonal cave monitoring during winter and summer season mostly travelling to study caves, routine microclimatic condition data keeping, bat monitoring inside the caves as well as performing evening emergence. He also

helped in collecting/making conservation materials such as designing boards, buying frames, buying/painting dustbins, etc.

Prabhat Kiran Bhhattarai, B.Sc. Forestry Science, Institute of Forestry, Tribhuvan University, Pokhara
He assisted in conducting seasonal monitoring during autumn. His role was to travel to study caves, routine microclimatic condition check-up, bat monitoring inside the caves as well as performing evening emergence.

Sunita Kunwar, B.Sc. Forestry Science, Institute of Forestry, Tribhuvan University, Pokhara
She assisted in conducting seasonal monitoring during autumn. Her role was same as Mr. Bhhattarai.

Pratyush Dhungana, B.Sc. Forestry Science, Institute of Forestry, Tribhuvan University, Pokhara
He assisted in conducting seasonal monitoring during winter and spring season. His role was the same as other individuals. In addition, he facilitated conservation activities such as installation of boards in each cave, invited cave management members to our programs, managed and moderated seminars, etc.

12. Any other comments?

We would like to acknowledge The Rufford Foundation for this wonderful learning and working opportunity for conservation of bats and caves in the region. We are thankful to Nepal Bats Research and Conservation Union for providing a platform to conduct bat research and conservation activities in Nepal. We are also thankful to cave management groups for their enthusiasm and active participation in our several conservation programs. We are looking forward to conducting more bat and cave research in Nepal. This is just the beginning.