Final Evaluation Report

Your Details	
Full Name	Hem Bahadur Katuwal
Project Title	Globally Threatened Lesser Adjutant in Lowland Nepal: Distribution, Breeding Ecology, People's Attitude and Education Outreach Programmes
Application ID	31372-2
Grant Amount	£6,000
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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
1.Identifying nesting site locations and mapping the potential distribution of Lesser Adjutant in lowland Nepal			■	All the potential nesting sites of lesser adjutant were identified.
2.Identify the factors affecting the nest site selection and fledging success of the Lesser Adjutant			■	Measured tree characteristics (species, height, and DBH) of the nesting tree and the breeding variables (colony numbers, colony size, total number of chicks, and fledging success per colony). Using this information and the landscape variables from the satellite-derived images, factors affecting the nest site selection and breeding success can be identified.
3.Understand knowledge, behavior and attitudes of people towards the Lesser Adjutant			■	Conducted semi-structured interviews with 480 people to understand the lesser adjutant knowledge, attitudes, and perception.
4.increased awareness within community, key stakeholders and the school children on Lesser Adjutant		■		Although raised awareness to more than 700 local people, key stakeholders and 1150 students, COVID-19 still restricted us to reach more people.

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

I obtained this grant in June 2020. I planned to search the species' nesting sites from the end of July 2020, but it was challenging to travel long distances as the local government started to ban moving in some of the locations due to COVID-19. All people, including my assistants, were afraid of the situation and found many difficulties during the survey. However, the nesting sites were monitored from three to six 6 times until January 2021, depending upon the locations we could visit. After that, I prepared a plan to conduct an interview survey, poster publication, and the awareness programmes. However, the second wave started again and the lockdown started from April 2021. All the schools and the colleges were closed. So, it was difficult conduct the activities properly. However, I waited, and when the cases started to slow down, I conducted the remaining activities following the community guidelines provided by the government. Therefore, COVID-19 was the biggest

challenge to affect the project's activities as it restricted our interactions with communities, and I could not reach many people and schools. In addition, it was challenging to survey nesting sites inside the protected areas like Chitwan National Park and the Suklaphata National Park due to tall grass and the frequent sightings of wild animals like tigers and rhinoceros. To overcome this difficulty, help was taken from the army personnel, park staff and waited to cut or dry the tall grasses.

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

This is the first large study conducted in lowland Nepal on the breeding ecology and the conservation of the lesser adjutant. The most important findings of the project area are as follows.

1) Identifying the nesting sites and factors affecting the breeding ecology of the lesser adjutant: During this survey, nesting sites were identified from six districts, and our additional work supported by the institution (Xishuangbanna Tropical Botanical Garden) also helped to identify the breeding of species from other seven districts. Altogether, 103 colonies with 346 nests were identified, from where 540 chicks fledged successfully. This study shows that lesser adjutant was recorded more outside the protected areas than inside. They prefer to nest in tall, scattered trees such as *Bombax ceiba*, *Ficus religiosa, Haldinia cordifolia, Mangifera indica, Trewia nudiflora,* etc., primarily on the farmlands, followed by human habitats and few in the forest. The preliminary analysis shows that tree height and colony level variables such as colony size affect the breeding success of the lesser adjutant; however, a final analysis still needs to be performed. I will update this information via scientific papers later.

Photo 1: Nesting tree (*Bombax ceiba*) and fledglings of Lesser Adjutant

2) Potential distribution of the lesser adjutant in Nepal: Using 2020 and 2019 data, nesting sites of lesser adjutant were identified from 14 districts of lowland Nepal. Although the species distribution model analysis is not completed yet, the preliminary analysis and field visit shows that they are distributed in most parts of lowland Nepal below 350 m elevation. This includes less protected areas but more agricultural landscapes, human habitation, and the riverine valleys. I will update this information via scientific papers later.

3) Understanding people's perception of knowledge and the attitudes of the species: During the project, 480 people were interviewed to understand people's perception of the lesser adjutant behaviour. The majority of the people interviewed identified the species name, and they showed positive attitudes towards the species, although some people said that the stork drops snakes or bones below the nesting tree and makes the place dirty. The analysis shows that lesser adjutant is threatened by a lack of, or felling of, tall suitable nesting trees, unplanned urbanisation, hunting, and the degradation of the wetlands and the farmland habitats.

Photo 2: Semi-structured interviews with local people to understand the knowledge and attitudes of local people towards lesser adjutant.

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

This is a collaborative project with local to international partners. This project is directly linked with the knowledge and attitudes of the local communities. The local communities are involved and benefited by two activities of the project: 1) during the interview survey; and 2) through awareness programmes. After the questionnaires, awareness was done about the farmland birds' status, threats, the impact of using excessive chemical pesticides and fertilisers and promoted organic farming, legal consent about the hunting practices, and ways to conserve farmland birds. Besides this, schools and community awareness programmes were conducted. For this, PowerPoint presentations, quiz contests, and other interactive programmes were performed.

I also trained three nature guides of the partner organisations and six local students to survey and the monitoring of the breeding of the lesser adjutant. I also taught them about the ethics of the survey, keeping the scientific record of the data, and conducting awareness activities. This activity developed the capacity of the local partners and students to independently monitor the nest of the species after the project completion. I hope these activities helped increase people's knowledge about ecosystem service provided by the birds and the challenges they are facing in human-dominated agricultural landscapes.


Photo 3: School and community awareness programs in the study area

5. Are there any plans to continue this work?

Although lesser adjutant is distributed across South Asia and Southeast Asia, little is known about its breeding ecology. I tried to understand the factors affecting the breeding ecology and their potential distribution in lowland Nepal during this project. However, this project limitation should be considered while planning upcoming works. Yes, I am planning to continue on this work. My upcoming work will focus on understanding the breeding and feeding behaviour of the species and how they cope with the high human-dominated agricultural landscapes. Also, I suspect that the non-breeding population may migrate to larger areas, including India. So, if possible, I aim to perform the satellite tagging of the individuals to understand their habitat utilisation and migration behaviour. In addition, I am also planning to survey the occupancy of the lesser adjutant within the agricultural landscapes.

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

I am using some parts of this project data as part of my post-doctoral work at my institute. The outcomes of the projects will be shared with the international research committees during the defence process. In addition, the results will also be shared with the local people, local government, forest and park offices, nature guides, community forest user groups, etc. Similarly, results are also shared through online news and radio programs for large audiences. Finally, the project's outcome will be

published in two peer-reviewed journals such as Global Ecology and Conservation, Oryx, and will also be presented in different workshops and conferences in different countries.

Photo 4: Sharing information and advocating with the local government, division forest offices, and protected areas for Lesser Adjutant conservation.

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

The grant was used from June 2020 to July 2021. However, due to the COVID-19 pandemic, it was extended to January 2022 to complete all the project activities.

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
Stipends for the research assistants	1960	2000	+40	Increase in number of days
Travel and vehicle hire to rich the working sites for all field works	710	710		
Food for research assistants during field work	1400	1460	+60	Increase in cost/expensive
Printing posters	780	700	-80	
Awareness program for the local people	500	400	-100	
Awareness program for school children	500	580	+80	
Report preparation and dissemination	150	150		
Total	**6000**	**6000**		

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

The important next steps for understanding ecology and conservation of the lesser adjutants are as follows:

- Study of the breeding behavior of the lesser adjutant.
- Occupancy survey of the lesser adjutant.
- Satellite tagging of the lesser adjutant.
- Control felling of large nesting trees such as *Bombax ceiba*, *Haldinia cordifolia, Trewia nudiflora,* etc.
- Awareness programmes for the communities to increase positive attitudes of the people towards the species

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, I used the logo of The Rufford Foundation to produce the awareness materials like posters. I have attached the poster of the lesser adjutant. Besides this, The Rufford Foundation will be acknowledged during the seminar and the publication in the journals. Using the logo in these materials and events has received publicity by the foundation.

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

Hem Bahadur Katuwal – Principal Investigator - conceptualized the idea, performed the field survey, data analysis, awareness activities, report preparation and started writing paper

Other project members

- **Yam Mahato** – Helped in collecting data and awareness activities
- **Devraj Joshi** – Helped in collecting data
- **Ganesh Sah** – Helped in collecting data and awareness program
- **Balram Awasthi** - Helped in awareness activities and awareness activities
- **Krishna Prasad Bhusal** - Helped in collecting data
- **Shailendra Yadav** - Helped in collecting data and awareness program
- **Ram Shahi** - Helped in collecting data and awareness program

Photo 5: Poster of Lesser Adjutant

12. Any other comments?

I want to thank The Rufford Foundation for providing this grant to study the lesser adjutant's breeding ecology and understanding people's perception of ecology and threats in Nepal. I would also like to thank all my referees Professor Dr. Rui-Chang Quan, Dr. K.S. Gopi Sundar and Associate Professor Dr. Hari Prasad Sharma for providing references and suggestions for completing the project activities. Also, I would like to acknowledge the support of all my group members, all members of the Bird Education Society, Koshi Bird Society, Green Youth of Lumbini, Mithila Wildlife Trust, Bardia Nature Conservation Club, IUCN SSC Stork, Ibis and Spoonbill Specialist Group, Zoological Society of London-Nepal Office, Bird Conservation Nepal, National Trust for Nature Conservation and finally to my institute Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, Yunnan, China. I would also like to thank Dr. Hem Sagar Baral, Laxman Poudyal, Laxmi Joshi, Dev Narayan Mandal, Anis Timsina, Birendra Gautam, Subash Singh, Manju Mahatara, Sandip Luitel, Netra Koirala, Prashant Rokka, Dibya Raj Dahal, Ankit Bilash Joshi, Deu Bahadur Rana, Ishowari Chaudhary, Hirulal Dangaura, Ganesh Tamang, Nitesh Das, Chandra Chad, Kusum Upreti, Bhuwan Joshi, Bharat Awasthi, and Sarita Bhatta for their help, field visits, cooperation and support for the project activities and all people who directly and indirectly helped in the project activities.