Final Project Evaluation Report

We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF format**. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Complete the form in English and be as concise as you can. Note that the information may be edited before posting on our website.

Please email this report to jane@rufford.org.

Your Details	
Full Name	Mehreen Khaleel
Project Title	Distribution, ecology and habitat use of the Himalayan gray langur, Semnopithecus ajax in Jammu and Kashmir, India
Application ID	16535-1
Grant Amount	£5000
Email Address	mehreen.khaleel@gmail.com
Date of this Report	25.01.2018

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
Mapping the distribution of Himalayan gray langur, *Semnopithecus ajax* in Kashmir region.				See #3
Ecology and feeding behaviour of *S.ajax* in different seasons				See #3
Identifying conflict faced by *S.ajax* langur in the Kashmir region.				See #3
Conservation education and awareness.				See #3

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

Considering this project was aimed to access the protected and unprotected forest sites of Kashmir, which is a politically disturbed state, there were difficulties faced in 2016. Due to political unrest it became very difficult to do surveys even in the cities. All the roads and link roads were blocked for a period of 5 months. Because of which the deadlines of the project could not be reached within the said time. My sincere thanks to Rufford Foundation for extending the dates to a year and in understanding the issues faced during the completion of this project.

During surveys it sometimes became difficult to go to every household to ask for information regarding langur. The questionnaire surveys were done strategically by explaining to them about the project and how it can help them. Apart from getting information from people we also made them aware about this primate species and how they as a society can help towards the betterment of the species. Also, while conducting surveys, females were reluctant to talk about anything on wildlife and would rather avoid us. So, I had to take them in confidence that their identity will not be disclosed.

Language was a barrier as the people we were surveying belonged to different ethnicity. They were Gurjar, Bakarwal, Pahadi, Brokpa and Kashmiri people, with each having different languages. So, I had to hire assistants who can speak most of these languages and if in some cases it was not feasible I would ask some learned people from the village to help us conduct the surveys with proper translations.

Apart from all these difficulties, people were very cooperative and helped us in conducting small awareness programmes in local schools. They were very keen to know about this endemic and endangered species of langur.

Each time when we had to conduct on-ground surveys in places close to the international borders/protected areas we were stopped by Army officials which initially resulted in unexpected delays. We had to always seek their permissions and inform them beforehand about our duration of surveys and the nature of the work we were conducting.

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

The project was aimed towards the following objectives:

1) **Mapping the distribution of Himalayan gray langur, *Semnopithecus ajax* in Kashmir region.**

This work is the first assessment of the distribution of the little-known high-altitude primate, *Semnopethicus ajax* in the western Himalayas of Jammu and Kashmir. Data generated from this project about the distribution is critical for assessing and in filling up the lacunae about the diversity of langurs present in vast range of Indian subcontinent.

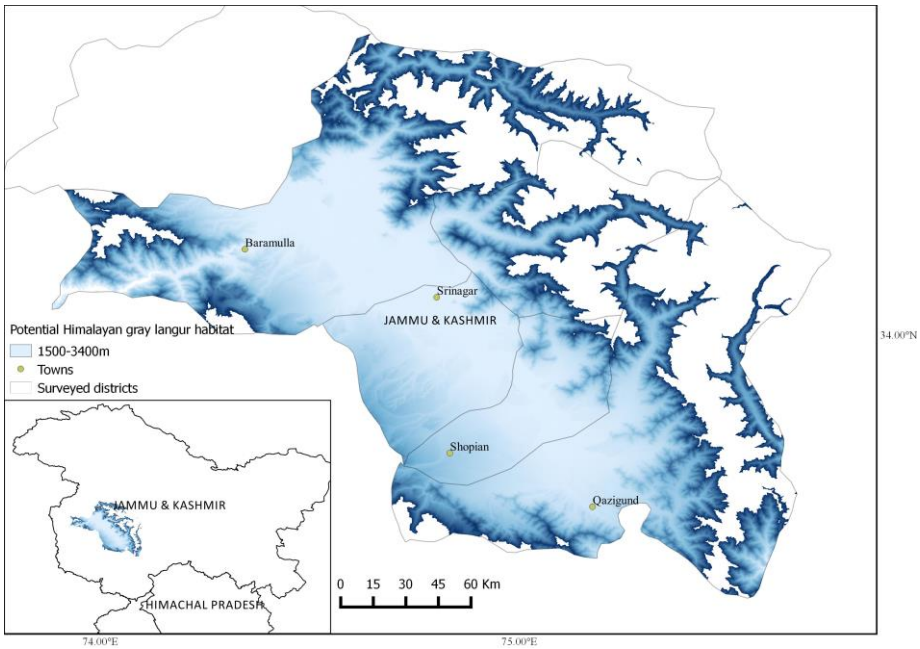
Under this objective, I was able to map the current distribution of Himalayan gray langurs in Kashmir valley. This information was gathered through proper scientific methods of surveying. Two different methods very used. Systematic questionnaire and on-ground surveys. The overall information was combined to achieve a current distribution map.

Based on information used from previous literature, possible habitat types and elevation range where the species could be present was predicted. Using satellite images, these maps were generated. Since they are known to occur between 1400-3400 m elevation ranges, regions above 3400 m were not considered for survey within Kashmir valley. Two broad habitat types were identified as broadleaved deciduous and coniferous type. Map 1 represents the potential habitat (blue regions in the map) of Himalayan gray langur in Kashmir. The total area (~6000 km^2) was divided into 118 manageable grids of 12 x 12 km (144 km^2) each. Out of these, 52 grids were selected because of logistics and were surveyed for both questionnaire and on-ground visits.

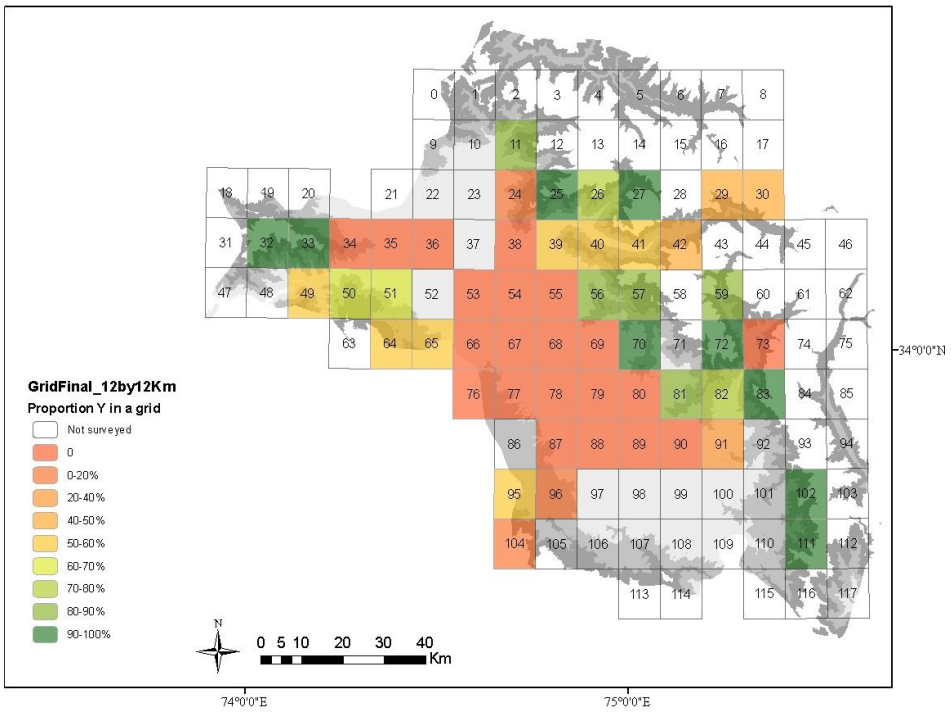
Within each grid, respondents were asked questions from a structured questionnaire (Table1). Respondents included herders, forest department officials, residents, farmers and school children, tourist guides, porters, trekkers, and wildlife enthusiasts, of different age groups (12-60 years) and gender. For proper identification, images of the study species were shown to the respondents. Respondents were asked questions such as: when was the last time they seen the animal; season in which seen; name of village where animal was seen; crop damage, if any; season in which animal raids crops; scare tactics used. Only one person was asked at a time and groups were avoided as it would influence the respondents' answers. A total of 564 people was interviewed with 10 Mean ± 6 SD. Based on this, Map 2 was generated. It represents the presence/absence of study species as proportion of respondents who responded positively to the identification.

These were followed by on-ground visits of the grids. Each grid was sampled for direct or indirect evidence of langur. Presence was identified as seen at least one langur and absence was identified as complete absence when even after thorough ground survey neither of the evidences (direct or indirect) were found. Surveys were done in team of 2-4 people per grid. Any line of evidence was marked as GPS locations with information of elevation and habitat information such as type. Map 3 shows the presence/absence for each grid surveyed. The green grids represent presence whereas, red grids show absences.

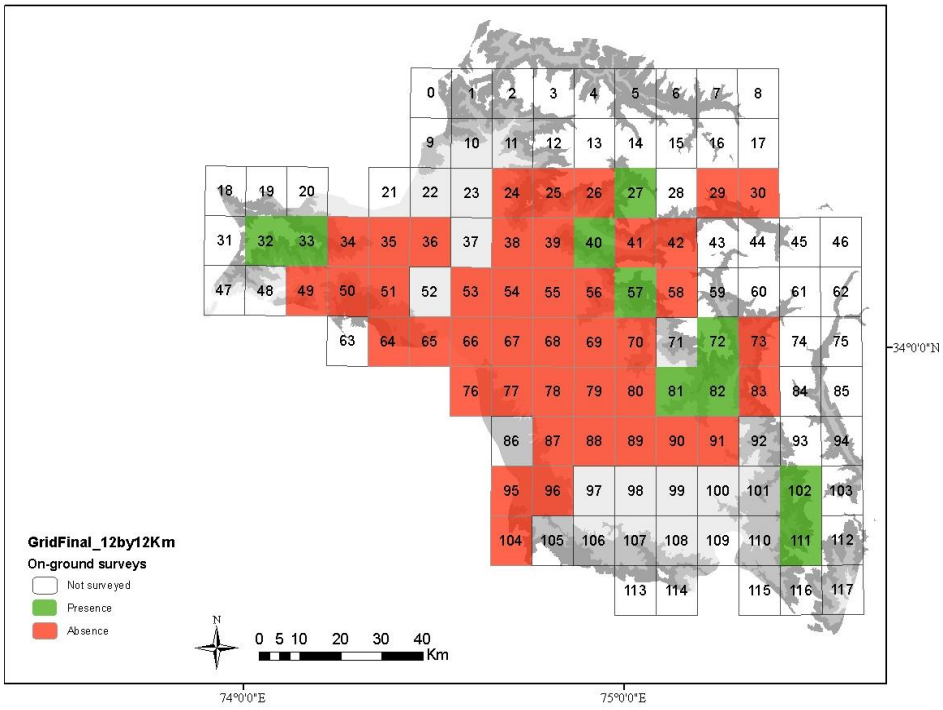
Based on this information, a current distribution was generated. From this information we were able to map out the distribution pattern of *S.ajax*. Out of 52 surveyed grids 10 showed presence whereas, 42 were absent of langur. It is interesting to note that most of the presences are in and around forest and protected areas above an elevation range of 1650 m. The 10 presence grids included areas such as: Dachigam National Park, Overa-Aru Wildlife Sanctuary, Kazinag National Park, Rajparian Wildlife Sanctuary, Tral Range Conservation Reserve, and Wangat Conservation Reserve. The land cover in these areas is mostly coniferous forests (21.92%) alpine grasslands and alpine vegetation (2.66% and 5.99%). In the lower areas (1400-1600m) which show absences, most of the land cover is cropland (17.04%) and plantation (15.57%), followed by human settlement (8.75%). From these result it's concluded that *S.ajax* being a shy leaf eating monkey, have adapted to survive in the less human habited areas of Kashmir. More information is required on their feeding preference and diet which will help us understand their distribution pattern.



Map 1: The areas/districts surveyed as potential habitat of S.ajax in Jammu and Kashmir, India



Map 2: Distribution of S.ajax based on questionnaire survey in the study area.



Map 3: Distribution of S.ajax based on ground surveys.

Table 1 Questionnaire used to assess the distribution of Himalayan gray langur in Kashmir.

S.No:	Grid ID:		Langur identified:				
Name of surveyor:	Date of Survey:		GPS Location and Elevation of village:				
Respondents information							
Name of Interviewee:	Occupation:		Address of Interviewee:				
Age:	Gender:						
Response about animal							
When was the animal last seen by? (Tick)	Today	Last week	Last month	Last year	5 years ago	Never	Don't remember
Season in which mostly seen:	Spring(Mar-May)	Summer(June-Aug)	Autumn(Sep-Nov)	Winter(Dec-Feb)			
Total # of animals seen:	#of male:	#of female:	#of juvenile:				
Name of the village where animals were seen:							
Conflict information							
Do langurs come to your village for crop raiding Y/N:							
How many langurs came to raid crops?	One (Adult M/Adult F)	Only males /Only females	Mixed large troop				
Which crops do they often damage?	Rice	Vegetable	Apples	Cherry	Other, specify		
In which season do they raid crops?	Summer	Winter	Autumn	Spring			
How do you scare them away?	Firecrackers	Shouting	Stones/killing	Any other			

2) Ecology and feeding behaviour of *S.ajax* in different seasons.

This objective was to look at the feeding habits of *S.ajax*. For this, a troop of 60 individuals were followed at Dachigam National Park. Plant species and part of the plant fed were recorded. A list of the feeding plant species is below (Table 2). The percentage time spent on different plant parts during winter and spring respectively were estimated as: bark (83% and 0%), bud (17% and 11%), leaf (0% and 56%), flower (0% and30%) and seed (0% and 3%).

Table 2 List of feeding plant species of *S.ajax*

Aesculus indica	*Populus alba*	*Euonymus hamiltonianus*	*Salix alba*
Berberish spp	*Populus ciliata*	*Fraxinus hookrii*	*Sorbus lanata*
Betula utilis	*Prunus armeniaca*	*Hedera nepalensis*	*Taxas bacata*
Celtis australis	*Prunus cornuta*	*Juglans regia*	*Ulmus villosa*
Corylus jacquemontii	*Prunus tomentosa*	*Lonicera quinquelocularis*	*Ulmus wallichiana*
Cotanaester spp	*Quercus robur*	*Morus alba*	*Viburnum cotonifolium*
Crataegus oxycantha	*Rhus succedanea*	*Morus nigra*	*Viburnum grandiflorum*
Rosa spp	*Robinia pseudoacacia*	*Parrotiopsis jacquemontiana*	*Pinus wallichiana*

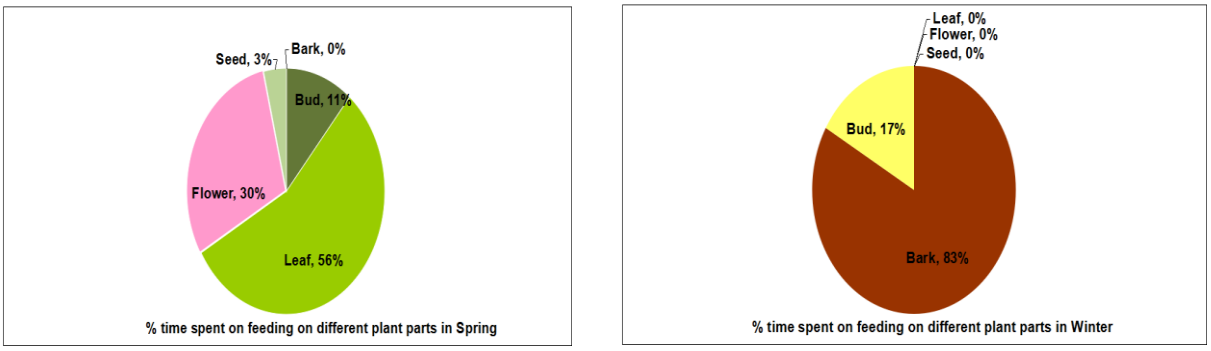


Figure 1 Percentage time spent on feeding on different plant parts in two different seasons.

3) Identifying conflict faced by *S.ajax* in the Kashmir region.

As far the conflict faced by *S.ajax* in Kashmir region is concerned, only a few villages close to Dachigam National Park, Overa Wildlife Sanctuary, and Hirpora Wildlife Sanctuary reported conflict. No conflict was recorded in rest of the places surveyed. These villages being close to the protected areas, which show most of the presence, are situated 15-20 m outside the boundaries of these protected areas, thereby falling within the home ranges of the langur troops present. These villages have agricultural fields and orchards which have seasonal crops like, mustard, vegetables, paddy, oats, with mixed plantation of apple, cherry and walnut trees. Langur troops come in huge numbers by crossing the fenced barrier between the national park and these croplands. Following incidences of conflict were reported from Dachigam NP and Hirpora WLS:

- In Dachigam, during winter of 2015, 2016, 2017 there were a total of 10 incidences when large langur troops were found inside the agricultural fields. They raided the mustard seeds and vegetables. Soon these were shooed back inside the fenced boundary by locals and wildlife guards on duty by bursting fire crackers.

- In spring of 2016, 50 individuals of a troop were found inside the apple and cherry orchard. They were feeding on flowers and barks of the trees. 12 individuals were feeding on flowers, leaf buds, bark and the rest were either feeding on the grass or were jumping off from one branch to another, hence breaking the young trees.
- In May 2017, forest officials got reports of one langur male in the foothills of the Zabarwan range, near forest block. The langur was found on a tree top when the rescue officials reached the spot. People were throwing stones and making loud noises. Soon it ran away back to the forest.
- In Hirpora, March 2015, one male langur had come down towards village side. This village has a few orchards very close the forest vicinity. The langur was found debarking the apple trees and had ruined most of the vegetable gardens. People threw stones and shouted to frighten the animal. Soon wildlife officials were called, and it was directed towards forest area.
- In Cherwanbagh, Kangan, August 2017 a single male was found in the orchard of a farmer. Animal was found on the walnut tree top but soon ran away as people gathered around it. No incidences of throwing stones or shouting were reported.
- In Mulnar village, two juvenile langurs were rescued on 28 June 2017. The two were found in the village by a local female and she was taking care of the juveniles. Along with the rescue and rehabilitation team of wildlife protection department, J&K, our team rescued the langurs. With the help of departmental veterinary doctor, they were treated and taken care for 1 week. After proper treatment they were released back to the forest with the troop.

A total of 160 villages were surveyed throughout the Kashmir valley. 564 surveys were conducted with 10 ± 6 SE questionnaires per village. People were interviewed from an already structured questionnaire. Out of these four villages identified conflict and 157 villages were the ones which didn't show any conflict. People identified conflict as raiding of vegetables in winter by langur troops. In New Theed and Overa people identified a large troop of langurs raiding crops in winter, whereas in Hirpora and Cherwanbagh it was only one adult male which would come towards village and raid apple orchards in early spring. Other than these, no incidences were reported from any of the villages. There were a few reports of single adult male raiding crops from Rajouri, this area was beyond the scope of this study hence wasn't further investigated.

As per locals the debarking of apple and cherry trees, causes in tree death. Because langurs feed or pluck the flower/leave buds of the trees it makes the fruiting difficult. These apple and cherry orchards are planted by farmers and raiding effects them economically. When the troops raid the agricultural fields, they destroy the standing crop, which is mostly rice, oats and maize. Once the standing crop is destroyed it can't produce any good quality crop. Rice being the staple diet of the area, such destruction affects the people in terms of low crop productivity.

During winter when most of the agricultural land is of no use, people cultivate vegetables such as radish, turnip, etc., langurs raid these vegetable gardens in

search of food. They dig out most of the crop making it useless for growth and consumption.

4) Conservation education and awareness

During the project, awareness programmes were conducted with locals, school children, and colleges. The mode of programmes were mostly lectures, essay competition, and quizzes, followed by interaction with school children. Children were aided with video documentary sessions, posters and pamphlet distribution. A short video documentary of the same species in its natural habitat was prepared and screened in schools. All the conservation education material was prepared in English language but later translated to local language for the ease of understanding. These programmes were held in different schools and colleges in different places of the region. The aim of these programmes was to bring awareness to the local children about the only langur species and other wildlife present in their locality. A total of eight programmes were organised with school and college children. Roughly around 500 students attended overall. Awareness and essay competition was held in Baramulla district in which 150 high-school children participated. This was done in collaboration with Wildlife protection department and Wildlife trust of India.

Moreover, each time a questionnaire was conducted, it was followed by a dialogue between the locals and the team members about general wildlife awareness and of the study species in specific. We showed them photos and posters and distributed stickers which include some basic information the animal.

Also as a part of conservation education, a talk was presented in Kashmir University to PhD scholars and undergraduates.

Conservation is always a collective effort and not of a single individual. I am glad to have conducted such programmes. This not only imparts general awareness but also sensitises people about the surroundings. In a conflict-ridden place like Kashmir, people hardly get time to think of their surroundings. I am pretty sure this might have helped them take their minds off for some time. It was surprising for me that a very few school children knew about this primate species and the threats it faces due to anthropogenic pressure and climate change. These programmes helped to build a general sense of sensitisation. I will look forward to conducting such awareness programs and impart conservation education to the locals. Due to lack to time and resources the entire study areas could not be covered.

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

For the fulfilment of above mentioned objectives, local communities played an important role. Since one part of the data collection was conducting questionnaire surveys their role was highly appreciated. In collecting such data, people get to know more about the wildlife in the threats they face due to human induced pressures.

The awareness programmes conducted benefitted the people in gaining knowledge about the endemicity of the study species. The results obtained from this project were shared with the local communities as well. I am sure, a sense of responsibility and awareness towards the wildlife has prevailed due to these programmes. Nonetheless, we were successful in inculcating the sense of ownership in the young minds towards the conservation of wild plants and animals in general.

Apart from that, the project involved local assistants who helped in collecting some of the information. Two local assistants were helped financially for working in this project. Two local interns were also hired during the project who helped us provide information from their close by communities on the conflicts.

5. Are there any plans to continue this work?

Since this was the baseline for collecting information on the distribution of langurs in Kashmir valley, I look forward in taking this work further ahead. My focus is towards the behavioural ecology of this species in their natural habitat. Of which, some work is already in progress.

I look forward to conducting more awareness programmes in collaboration with Wildlife Protection Department of Jammu and Kashmir and involve stakeholders active in the area. I would further wish to work towards maximizing the general wildlife awareness and how people can help towards a better future by taking responsibility for nature.

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

I am in the process of writing the scientific manuscript of these findings, which are important for the scientific community. This project was also a part of my PhD thesis. The thesis will be used by conservation scientists as a baseline information towards this species. Conference talks, and posters will be made in various relevant platforms to present the results obtained from this work.

Detailed 6 monthly reports of the work were shared with the Wildlife Department of Kashmir, keeping in mind the various conservation measures they can take towards this species. Further these results will be shared with different stakeholders in future which can help towards conservation education and awareness of this species.

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

The RSG was used from December 2015 – December 2017. The anticipated length of the project was from June 2015-July 2016. The field work of the project was started from December 2015 but due to political conditions in the study area (June-October 2016), the project deadlines got delayed. Two no-cost extensions were also asked from the funding authorities to fulfil all the objectives.

Even though the anticipated length of the project was for 1 year, the project got delayed due to unavoidable circumstances in the study area.

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
Per diem and Wages Salary for 2 assistants @ UK £126 /month /person for 12 months	2500	2500	0	
Casual Labour	500	500	0	
Accommodation and expenses Rented rooms@UK£15/month for 12 months	180	180	0	
Travel Local conveyance (Fuel@ UK£0.7/lit, UK£11.34/day for 168days)	920	1500	580	Unexpected hike in petrol prices UK£0.89/lit
Airfare (Bangalore-Kashmir, 1trip) @UK£210/trip	500	1000	500	I had to make 2 trips instead of 1 due to unavoidable conditions in the study area.
Field equipment Binocular (Nikon 16x50 Aculon A211 binoculars) @UK£120	120	120	0	
Digital video recorder (Panasonic HC-V250 Camcorder Camera) @UK£250	250	250	0	
Miscellaneous items Stationary and conservation materials, poster and pamphlet printing.	300	150	150	We received discounts for bulk printing.
TOTAL	**4980**	**6200**	**1220**	

When the funds were received the exchange rates were INR98, but the same reduced to INR 87.00. Current exchange rate, as on 13.01.2018 (£ sterling to INR) = 87.33

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

As the baseline information about the distribution of this species is developed, the next step is to acquire information about the relevant ecological questions. Information related to the home range, social structure, survival and population status are some of the important aspects that should be looked for. Scientific investigation as to why this species is restricted in the forest ranges of Kashmir is the next step forward. This includes investigating the habitat preference, feeding preference and answering how this is helped the species to survive in the high-altitude mountain ranges. Also, from my findings, the level of conflict is very low which is different from other high-altitude langur species found in India. It becomes interesting to understand the why of it.

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, the logo was used in the posters, pamphlets, stickers which were distributed to schools. Also in the presentations prepared for awareness programs. RF gained huge publicity among the young students who were addressed during most of the awareness programmes. We also conducted quiz programs and essay competitions, and the winners were awarded with information leaflets with RF logo on them. Moreover, I have used the logo in the presentation given at a workshop on 'Biodiversity of Kashmir Himalayas' at Kashmir University, Satellite campus, Kargil.

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

The team included:

Mehreen Khaleel: Collected data, awareness programs, report writing, permits, and data analysis.
Sumanta Bagchi: Study design, and data analysis.
Riyaz Ahmad: Helped with permits.
Younis Khatana: Field assistance during the entire course of the project.
Tahir Gazanfar: Conservation education and awareness programs conducted in collaboration with Wildlife protection department, Jammu and Kashmir and Wildlife trust of India.

12. Any other comments?

I am very thankful to the Rufford Foundation for helping me fund this project. I appreciate their support and the extensions provided by them during the time of need. I hope the foundation will continue to support my work and further conservation activities in future. I believe, in areas which are less explored, such important conservation work should be supported.