



The Rufford Small Grants Foundation Final Report

Congratulations on the completion of your project that was supported by The Rufford Small Grants Foundation.

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. 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. Please be as honest as you can in answering the questions – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

Please complete the form in English and be as clear and concise as you can. We will ask for further information if required. If you have any other materials produced by the project, particularly a few relevant photographs, please send these to us separately.

Please submit your final report to jane@rufford.org.

Thank you for your help.

Josh Cole, Grants Director

Grant Recipient Details	
Your name	Tharaka Kusuminda
Project title	Species diversity and pest control service of insectivorous bats in major Tea growing regions in Sri Lanka
RSG reference	17065-1
Reporting period	August 2015 – August 2016
Amount of grant	£5000
Your email address	t.kusuminda@gmail.com
Date of this report	11 September 2016

1. Please 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) Study on species richness of insectivorous bats in six major Tea growing regions		X		<p>I identified permanent roosting sites of bats in and close to the six selected tea plantations representing all major tea growing regions in Sri Lanka. Those roosting sites are using by <i>Pipistrellus ceylonicus</i>, <i>Rhinolophus rouxii</i>, <i>Hipposideros lankadiva</i>, and <i>Hipposideros speoris</i>. Unfortunately the Department of Wildlife Conservation granted permission to me for capture bats and insects on 15 March 2016. Due to this situation, field works weren't conducted from August 2015 to March 2016. After that first field work was conducted in April 2016. Because mist net supplier asked my valid permit copy to capture bats before send purchased mist nets to me. During pilot field sampling for bats in April 2016, I captured following species of bats inside tea lands using trapping gears. <i>Pipistrellus tenuis</i>, <i>Pipistrellus ceylonicus</i> and <i>Rhinolophus rouxii</i>. Also, observed lot of bats are feeding on insects in the tea plantations proving that, proposed project will bring interesting results about pest controlling service of insectivorous bats in tea cultivation. Suddenly many areas in the country including sampling sites was affected by unexpected heavy rainfall due to a cyclone and landslides in May and by flooding in June and July</p>

				months of 2016. Therefore, I had to stop field works due to insecure situation. Please refer question 2 for more information.
(2) Study on diet of insectivorous bats in six major Tea growing regions	X			Due to the late receiving of wildlife permit and unusual bad weather condition existed during proposed field sampling months, the capturing of bats and analyse its droppings to represent its seasonal diet variation systematically was not achieved. Please refer question 2 for more information.
(3) Analyse species diversity of insectivorous bats in six major Tea growing regions	X			This objective is depending on results of objective 1 and due to lack of enough data from all six sampling sites representing all four seasons, this objective was not completed.
(4) Prepare a list of insectivorous bats that controlling tea pests	X			This objective is depending on results of objective 2 and due to lack of enough data from all six sampling sites representing all four seasons, this objective was not completed.
(5) Prepare diet compositions of pest controlling bats	X			This objective is depending on results of objective 2 and due to lack of enough data from all six sampling sites representing all four seasons, this objective was not completed.
(6) Conduct an awareness program for selected tea planters about pest control service of bats	X			I planned to address final objective after collecting and analysing all data which should receive from all above objectives (obj. 1-5). Therefore, this objective was not achieved.



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

a) Research permit to capture bats and insects is granting by the Department of Wildlife Conservation (DWLC) in Sri Lanka. Subsequent wildlife research committee meeting was hold in December 2015 after receiving of RSG to me. Unfortunately, it postponed several times due to an issue arose on the Director position of DWLC. After the DWLC research committee meeting, they gave approval for the proposed study and several points in the proposal were subjected to changes. Then it took another few months to conduct official works related to the wildlife permit. Finally the wildlife permit to capture bats and insects was received to me on 15th March 2016 with wasting 8 months from the proposed project time period.

b) Beginning on May, a low pressure system triggered strong winds and very heavy rain across much of Sri Lanka. This triggered flooding and landslides, including a landslide near Aranayaka division in Kegalle District, which devastated three villages. One of my sampling site in Yatideria (representing Kandy-Wet zone mid country tea growing region) situated near to that landslide area and most access roads were blocked due to flooding. Many highland areas including tea lands were noticed as risky areas for landslides. More than 418,000 people have been affected by extreme weather in 22 districts. The districts of Colombo and Gampaha remain the worst affected. As waters subside in areas affected earlier in the month, the flooding risks were arose in western Sri Lanka and Colombo where river levels continue to rise due to run-off from higher elevations. Finally, it was the worst floods in 25 years and my home also affected by the floods.

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

- 1) We observed both aerial hawking bats and flycatching bats foraging in tea plantation habitat which, like to search foods in open areas and forest interiors respectively. Ex: *Pipistrellus tenuis* and *Pipistrellus ceylonicus* are aerial hawkers; *Rhinolophus rouxii* and *Hipposideros speoris* are fly catchers.
- 2) Aerial hawkers are using open spaces above tea bushes and shade trees in tea plantation habitat. Flycatchers using surface of vegetation and spaces between trees in tea plantation habitat.
- 3) Due to limited amount of data, there is no significant outcome to describe at this moment.

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

Managers and workers in tea plantations and villagers around tea plantations were actively helped me to find bat roosting sites. However, they were not still benefited from this project, because more fieldwork and general awareness works are remaining to do.

5. Are there any plans to continue this work?

Definitely, I planned to do this project systematically from this month, according to the project timescale as a new project. Because, all the requirements to conduct this study such as triple high mist net system, harp trap, hand net, digital camera with all accessories, spring scale, light traps and field consumables were already purchased and available with me. Addition to that headlamps, GPS receiver, digital vernier calliper, three-man dome tent, field gloves, external hard drive, laptop, etc. with me. Budgeted transportation cost and subsistence cost for research team is remaining for conduct future field works without creating any financial issue.

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

Our results will be shared through online publications, newspaper and magazine articles, and once we have collected more data we will publish our results through one or few research papers in peer-reviewed journals. Also our results will be published and presented in upcoming RSG conference in Sri Lanka. We will also plan to do awareness programme for the plantation community, public and the conservation community here in Sri Lanka.

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

The RSG funds were delivered in August 2015 and these funds started to be used in September 2015 and ended in March 2016 to buy budgeted equipment. The pilot field sampling to select sampling sites were conducted using personal funds and rest of budgeted transportation and subsistence cost were not used up due to above explained unexpected difficulties. But I am sure that, despite of these delays, this project is going to produce very positive results, useful to promote conservation of insect-feeding bats associated with tea plantations in Sri Lanka, and to help tea growers to reduce costs in chemical pest controls.

8. Budget: Please 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.

1 British Pound Sterling equals to 196.11 Sri Lankan Rupee

Item	Budgeted Amount	Actual Amount	Difference	Comments
Forest Filter 3H Mist Net Set	472	523.8	-51.8	
G7 Forest Strainer Harp Trap	947	1051.5	-104.5	
Shipping & Handling charges for mist net and harp trap	482	587.9	-105.9	
Mist nets for 3H Mist Net Set and single use	0	303.7	-303.7	Mist nets were not included in to the Forest filter 3H mist net set. Therefore, I purchased required mist nets separately.
Canon EOS 7D 18 MP CMOS Digital SLR Camera	679	560.9	118.1	
Canon EF 100mm f/2.8L IS USM Macro Lens	644	586.4	57.6	
3 custom made light traps	153	150	3	
Micro-Line Spring Scale, with hook, 60 g	48	52.6	4.6	
Transportation charges	874	0	874	Transportation charges weren't spent.
Subsistence for the research team	588	0	588	Subsistence for research team weren't spent.
Ethanol 70% (2.5 litre) x 2	97	76.4	20.5	
Batteries (AAA) for headlamps	16	16	0	
TOTAL	5000	3909.5	1090.5	



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

It is important that researchers who are studying the same subject related to other commercial crops and exchange their experiences to formulate unified strategies for the conservation and management of insectivorous bats associated with agricultural crops in tropical areas. We need to generate a solid and permanent coalition with tea planters in Sri Lanka, to pass them the idea of using bats as bio controllers, and therefore, helping to promote bat conservation in the areas where tea plantations are existing.

10. Did you use the RSGF logo in any materials produced in relation to this project? Did the RSGF receive any publicity during the course of your work?

Still I didn't find any chance to use RSGF logo and give publicity. In all materials producing in related to this project in the future will acknowledge to RSGF and use the RSGF logo.

11. Any other comments?

I am grateful to Rufford Small Grant Foundation for supporting me in this project. I also regret for not having met the set time, but this was a situation that is beyond our control. However, I am committed to complete this project as it surely will give great contributions to the conservation of bats. I commit to continuously sending my progress and achievement to RSGF during the next 1-year period.