

## The Rufford Foundation Final Report

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

We ask all grant recipients to complete a Final Report Form that helps us to gauge the success of our grant giving. The Final Report must be sent in **word format** and not PDF format or any other 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. 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. Please note that the information may be edited for clarity. 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](mailto:jane@rufford.org).

Thank you for your help.

**Josh Cole, Grants Director**

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| Grant Recipient Details    |                                                                                                                                                                     |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Your name</b>           | Pramod Kumar Yadav                                                                                                                                                  |
| <b>Project title</b>       | Assessing the socio-economic influence and sustainable management of <i>Ophiocordyceps sinensis</i> harvesting in the Dharchula-Munsiari landscape, Indian Himalaya |
| <b>RSG reference</b>       | 17697-1                                                                                                                                                             |
| <b>Reporting period</b>    | February 2016 to June 2017                                                                                                                                          |
| <b>Amount of grant</b>     | £ 5000                                                                                                                                                              |
| <b>Your email address</b>  | Pramod.yadav31@gmail.com                                                                                                                                            |
| <b>Date of this report</b> | 30 June, 2017                                                                                                                                                       |

**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                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------|--------------|--------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To understand the socio-economic impact of the harvesting and trade of caterpillar fungus on the rural people of the study area |              |                    |                | The team has collected data through questionnaire surveys and group discussion with stakeholders. The aim was to interview a cross-section of the community that reflects age, gender, types of employment or livelihood and participation in traditional activities. |
| To understand the environmental and conservation awareness of the harvesters and their practices during the collection          |              |                    |                | Outreach programmes on the conservation and sustainability of caterpillar fungus were carried out among stakeholders.                                                                                                                                                 |
| Documentation of the habitat, harvesting process and selling of the caterpillar fungus                                          |              |                    |                | Interviews were conducted to document procedure of harvesting, cleaning and preservation of the harvest, and selling them to the small-time traders. The caterpillar fungus habitats were also assessed by transect walk and species locations were recorded by GPS.  |
| To study the local management practice for the sustainable harvesting of the caterpillar fungus                                 |              |                    |                | The team has conducted interviews and group discussions with stakeholders to understand local management practices for the species.                                                                                                                                   |

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

The project team has worked hard in the Dharchula-Munsiari landscape for the collection of data regarding the harvesting, trade, and habitat as well as management practices of caterpillar fungus (*Ophiocordyceps sinensis*). The session of collection of the species starts at the beginning of May till the end of July every year. The duration of the collection period depends on many factors like local weather, condition of snow in alpine meadows, elevation of collection site, etc. In the beginning, people of the study area were quite doubtful about our true intentions because trans-boundary trade of the species is illegal in the region. This made the project implementation difficult initially.

To overcome the initial resistance from local community, the project team made every effort to try to convince them that project aim is not going to harm their activities, and the objective of our study is to make the harvesting of the fungus sustainable so that the people can keep on getting long term benefits from it by not letting the species to get extinct. For this, the team conducted outreach and developed strong network within stakeholders to implement the project.

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

Caterpillar fungus is a flagship species of the Himalaya and one of the world's most expensive natural medicinal resources, almost like gold. In the Dharchula-Munsiari landscape, it is inhabited mostly in isolated patches of alpine meadows (elevation from 3,500 to 4,500 m asl) of Gori and Kali Valleys. Data for the study was collected through questionnaire surveys, Participatory Rural Appraisal and Rapid Rural Appraisal methods, and following outcomes have been reported.

#### **I. Documentation of harvesting process and selling**

The harvesting season of caterpillar fungus starts in the beginning of May and lasts till the end of June and it depends on many factors like the local weather, condition of snow in the pasture and elevation of the collection site. The harvesters recline on the ground over the high-altitude expanses, attentively scanning the terrain. It is a difficult task requiring attention and tolerance for harvesting. Indeed, the height and thickness of caterpillar fungus are so small almost like stalk of an apple that it cannot be easily seen. But mountain people work very hard since it is considered particularly strenuous, the enterprise is highly profitable. Caterpillar is first dug out of the ground it is covered in dirt and the best way to remove this layer is with a toothbrush. During cleaning process careful consideration must be taken not to damage or break the caterpillar fungus. After drying in shade, species is ready to trade and people store it in a dry place to save from moisture.

Due to the resource scarcity and high publicity, both the demand and the price of the caterpillar fungus is very high causing fierce competition among harvesters and traders. Over the last decade, Himalayan villagers have become astute to the commercial potential of caterpillar fungus. They harvest it, and then sell it to the local traders. These traders feed the growing demands in Asia's fast growing urban centres, as well as that of the western countries.

#### **II. Socio-economic impact of harvesting and trade**

Harvesting and trade of caterpillar fungus plays a significant role in economy of communities who are living inside the landscape. Harvesters spend this income on child education, family healthcare and subsistence needs for whole year. Furthermore, they do not have to rely completely on agriculture which again is subjected to rainfall and wildlife depredation. Thus, the income derived through the collection and trade of this precious caterpillar fungus has led to an enhanced empowerment of marginal communities, often living in extremely remote locations, who used to secure their survival only through pastoral and agricultural activities. But there is a dark side also to the harvesting of caterpillar fungus. In addition to having

to brave harsh climates to find caterpillar fungus, its rarity means that there are no guarantees that a collector will find anything at all. Some villagers return with nothing to show, for their weeks of hardship in high altitude snow fields and many fall ill. People often return to the village with snow blindness, painful joints, and problems of breathing. In the past, community disputes mostly occurred over grazing rights, now they are mostly fought over access to caterpillar fungus resources, and some of these turn violent.

Thousands of villagers go for mass collection of the species each year, along with their tents, food, other consumables and domestic animals. These huge aggregations in the remote pastures are bound to destroy the pristine nature of the ecosystems and the threatened species that inhabit them. Ultimately, increasing trade-induced over-harvesting seems almost certainly responsible for declining populations of the caterpillar fungus, which needs to be assessed more scientifically.

### **III. Impact harvesting on the spices and its habitat**

Despite increase in price and demand of caterpillar fungus, results show harvest at local level is decreasing and on the other hand the number of harvesters has increased. Ultimately, increasing trade induced over-harvesting seems almost certainly responsible for declining populations. The study results reveal that over-harvesting and decreasing population of the caterpillar fungus are causing threats for the species survival in natural habitat of its occurrences. In the landscape, habitat of caterpillar fungus (alpine meadows) also support many endangered flora and fauna including the snow leopard that might get affected due to anthropogenic pressure of harvesters.

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

The team targeted different groups of people for these activities and put a special emphasis on making young people, especially school students, environmentally aware. The team discussed on various issues ranging from the harvest and trade of the caterpillar fungus of different *Ophiocordyceps* range countries (China, Bhutan, India and Nepal) till the public opinion on possible policy solutions for addressing various challenges in the Indian context. People were encouraged to be more environmentally friendly and less polluting while visiting the alpine meadows or collecting caterpillar fungus. They were asked to minimise the use of plastic and bring back the non-biodegradable wastes from the meadows while returning to their village after the collection period is over.

### **5. Are there any plans to continue this work?**

During collection period, threats such as overgrazing, chopping of trees for firewood, non-degradable garbage in the vicinity of harvesters' camps, increased human population in alpine pastures etc. probably have a deleterious effect on caterpillar fungus and environment. Ground-dwelling birds, charismatic megafauna and vegetation composition might be also deterred by harvesters' activities. There is need of long-term field studies on conservation challenges and impacts of

anthropogenic pressure on the species as well as its habitat, data on these aspects are minuscule in the region. The team is developing a study to address above mentioned issues in the region.

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

The results from the study will be publicised among the stakeholders and the issues regarding the conservation and sustainability of the caterpillar fungus will be highlighted for the benefit of the species and the people. Journal articles on results of the project have submitted in peer-reviewed journals and presented at national and international conferences to disseminate the findings. A report on project finding will be also submitted to the stakeholders.

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

Initially the project was awarded for 12 months. Since the harvesting period of caterpillar fungus is confined to only 30- 45 days (between May to July), the team was unable to complete project objectives on the proposed schedule. For successful completion of the proposed assignments, the project team has requested to the RSG for an additional 6 months.

**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.**

| Item                                     | Budgeted Amount | Actual Amount | Difference | Comments                                                                                       |
|------------------------------------------|-----------------|---------------|------------|------------------------------------------------------------------------------------------------|
| Per diem for two research assistants     | 504             | 610           | +106       | Due to remote and tough terrain more field assisted were employed                              |
| Rucksack and Field shoes                 | 248             | 240           | -8         |                                                                                                |
| Data storage devices                     | 80              | 75            | -5         |                                                                                                |
| Travel expenses                          | 721             | 910           | +189       | The team has visited remote villages by the hired taxi where no public transport was available |
| Food and accommodation during field work | 2520            | 2684          | +164       | Volunteers were also engaged for the field work                                                |
| Expenses for outreach programme          | 512             | 210           | -302       |                                                                                                |
| Contingency                              | 110             | 80            | -30        |                                                                                                |
| Communication                            | 51              | 51            |            |                                                                                                |
| Report and publication                   | 254             | 140           | -114       | Report has been prepared and journal articles on findings are                                  |

|              |             |      |   |              |
|--------------|-------------|------|---|--------------|
|              |             |      |   | under review |
| <b>Total</b> | <b>5000</b> | 5000 | 0 |              |

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

The regulation of rampant exploitation and implementation of scientific sustainable harvesting should be carried out for the survival of caterpillar fungus and to conserve pristine alpine meadows. Government policies should be formulated and implemented subsequently to integrate conservation, livelihood and governance for this species in the region. Thus, the holistic management of the species should be preferable not only for conservation prospective but also for economic wellbeing of the indigenous communities.

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

The RF received publicity during the course of this project on different notational and international arena. The project team had used the Rufford Foundation logo on produced materials for following conferences/events:

1. Role of Park and Sanctuaries in Protecting India's Biodiversity (1th to 13th May, 2016).This international meeting at the University of Chicago Centre in New Delhi.
2. Conservation Asia - 2016 (29th June to 2nd July, 2016) International Conference of the Society for Conservation Biology (SCB) and Association for Tropical Biology and Conservation (ATBC) at the National University of Singapore.
3. Fostering Grassroots Conservation in India - A Rufford Initiative, 2017 (23rd to 26th April, 2017) Ranthambore, India. This conference was organised to bring the Rufford grant recipients on a common platform to develop strong networks for conservation in India.
4. Presentation during a certificate course in ecology and conservation (AFEC-2016)at the Xishuangbanna Tropical Botanical Garden Yunnan, China
5. Final Report of project for the stakeholders.

**11. Any other comments?**

**Acknowledgements**

The project team is extremely thankful to the Rufford Foundation), Conservation Leadership Programme (CLP) and Idea Wild Grant to provide funds to carry out this extremely relevant research to conserve caterpillar fungus. Finally, the project would not have been feasible without the generous permissions and every possible help by the officials and the field staffs of the Forest Department of Uttarakhand, for which the project team forever indebted to them.

## Funding



## Annexure: Disseminating project finding at international platforms



**Figure:** Presenting project outcomes at meeting at the University of Chicago Centre in New Delhi



**Figure:** Presenting project outcomes at Xishuangbanna Tropical Botanical Garden Yunnan, China