# The Rufford Foundation
# Final Report

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.

Thank you for your help.

**Josh Cole, Grants Director**

| **Grant Recipient Details** | |
|---|---|
| **Your name** | Ripu Kunwar |
| **Project title** | Collaborating Communities, Conserving Critical: Conservation of indigenous medicinal plants and knowledge in Baitadi and Darchula districts, Nepal |
| **RSG reference** | 21198-2 |
| **Reporting period** | January 2018 |
| **Amount of grant** | 4880 |
| **Your email address** | rkunwar@fau.edu |
| **Date of this report** | 12/02/2018 |

**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 |
|---|---|---|---|---|
| Cataloguing the useful plants of Darchula and Baitadi districts | | | | A list of 255 plants catalogued. |
| Evaluating the vulnerability of useful plants by assessing their use value indices | | | | Use value and Informant Agreement on Species compute.d |
| Habitat modelling of the top five most vulnerable species including two IUCN threatened species (Paris polyphylla and Oroxylum indicum) | | | | Distribution modelling of forest types and vegetation composition was made. Species wise distribution modelling of only one target species *Paris polyphylla* was accomplished. |
| Identifying the knowledge gap, and raise awareness about the importance of indigenous species, indigenous knowledge and their role in biodiversity conservation | | | | Discussed with local stakeholders, identified the major gaps and incentivised them to initiate conservation works locally. |
| Leveraging local, national and international communities for conservation of indigenous species and their associated knowledge for sustainability of plants and people. | | | | Sigas protected forest was set up by Government of Nepal in 2017. The forest covers my study area of Baitadi district. The accomplishment was partially supported by my study data and vice versa. Api Nampa Conservation Area was already established to conserve the culture and biodiversity of northern Darchula. |

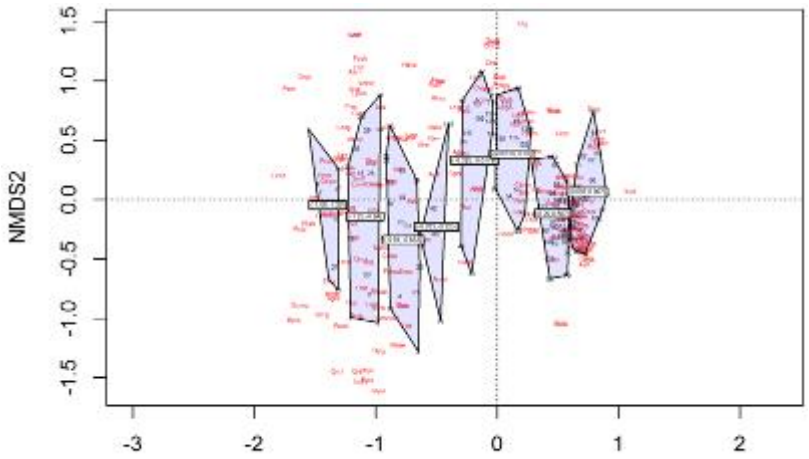
**2. Please explain any unforeseen difficulties that arose during the project and how these were tackled (if relevant).**

Once the grant was approved, I started field preparation and obtained requisite consent letters. I went Nepal in February, 2017 and started field work first in Baitadi because in winter the access to Darchula is limited. Once the winter was over, local people again headed to highland pastures for collection of high value medicinal

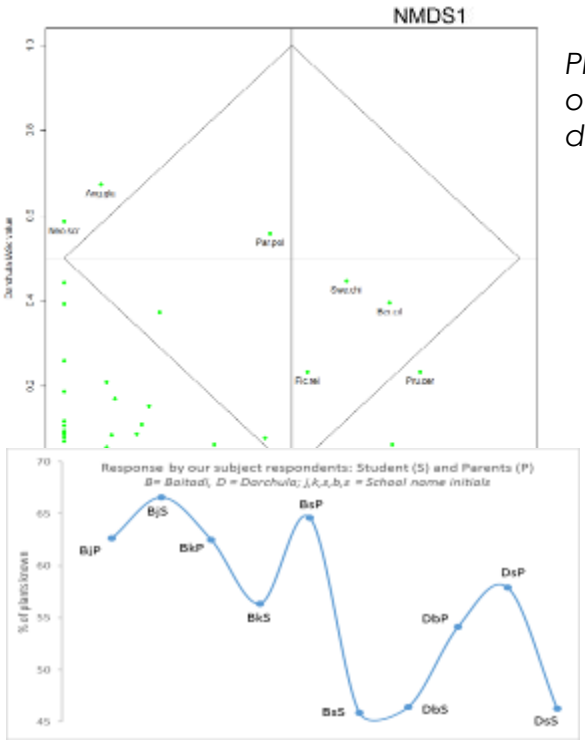
plant *Ophiocordyceps sinensis*. This was not a direct containing factor, it limited my discussions with the communities.

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

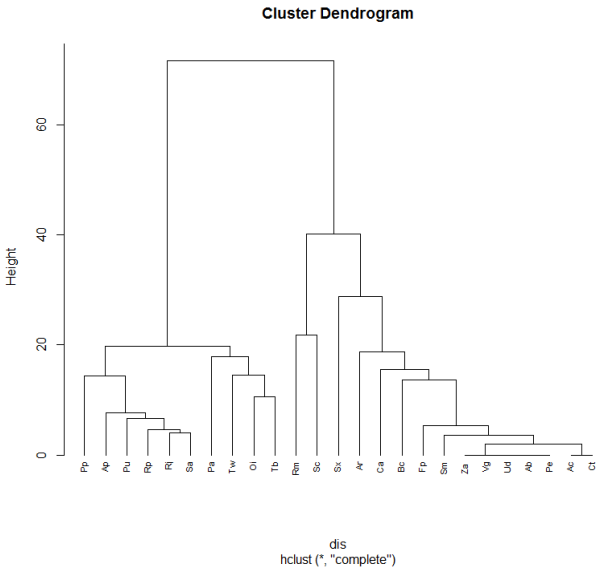
3.1 A total of 255 plants were catalogued along with their distribution and use values. This link gives details of 255 plant species enumerated. http://www.editorialmanager.com/bioc/default.aspx




*Distribution of forests and plant species.*

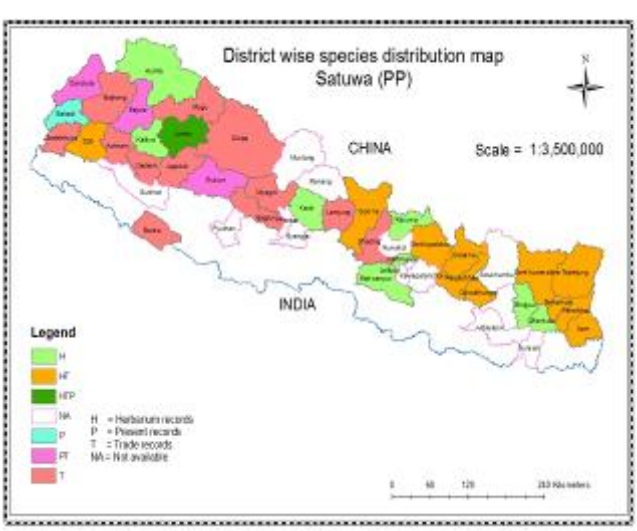


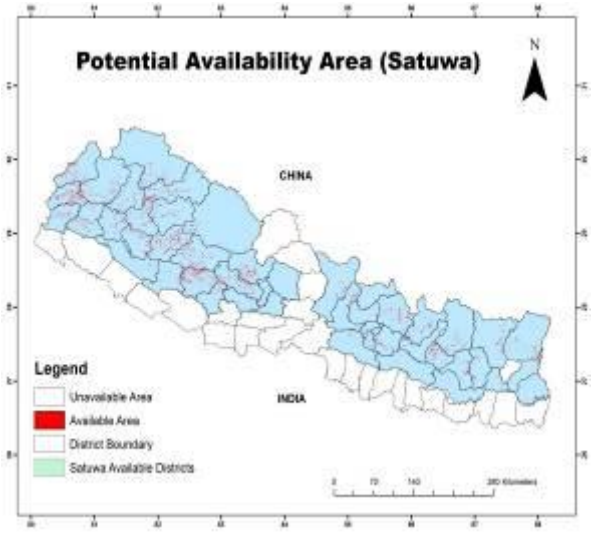

*Plant use importance (Informant Agreement on Species (IASc) in Baitadi and Darchula district. Plant names are abbreviated.*



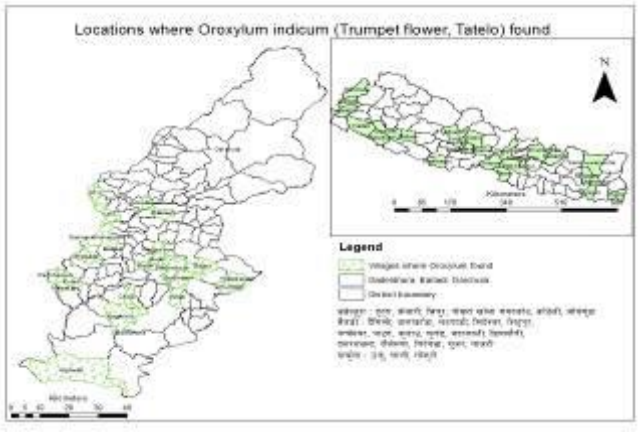

Response graph: Based on responses of students and their parents, students were less able to identify plants than parents. The respondents from Baitadi district identified most (left), Cluster dendrogram gram of subject 25 species (right).

3.2 Modelling of plant and forest distribution was accomplished. Detail of distribution of *Paris polyphylla* at district level and national level has been given below.




*Distribution of Paris polyphylla in Nepal.*

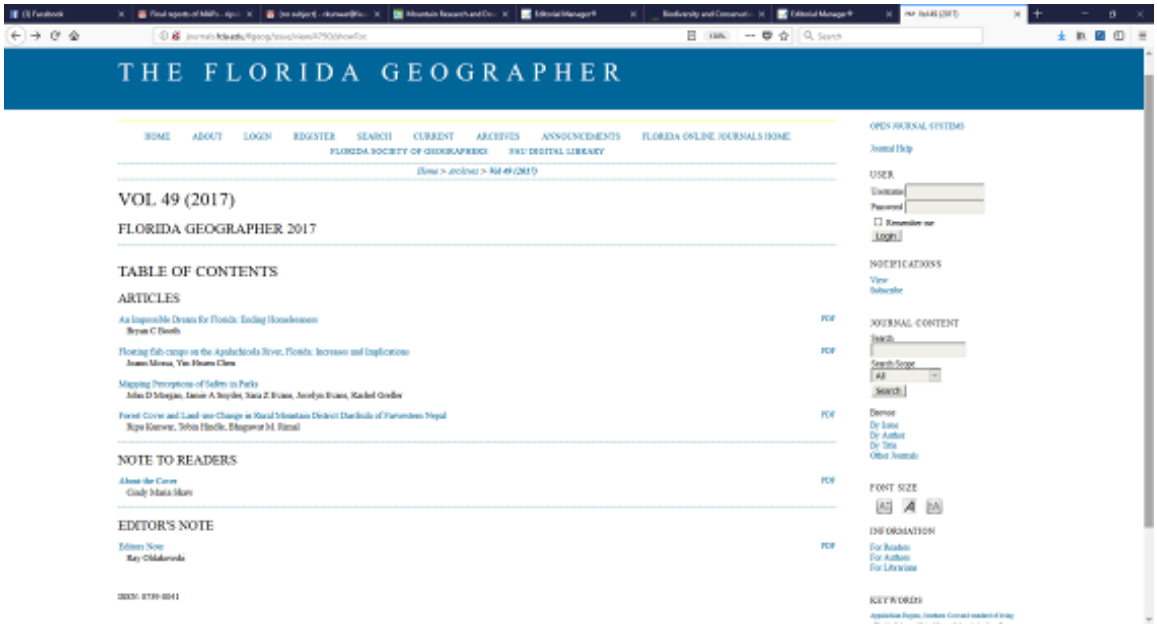


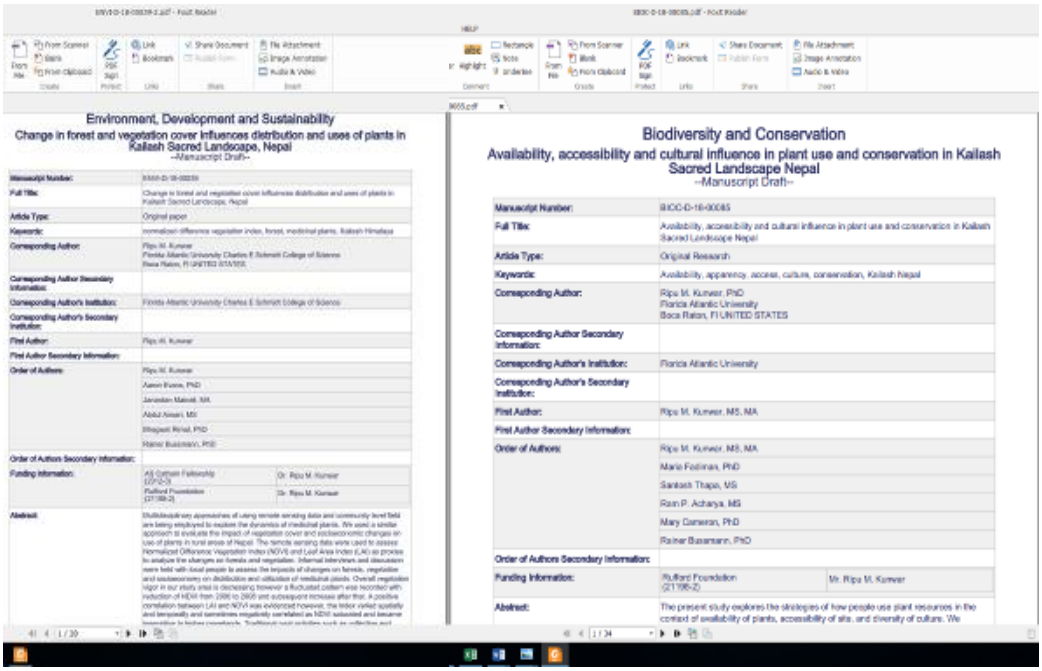


*Distribution of P. polyphylla (right) and Oroxylum indicum (left) in study area.*

*Paris polyphylla (left, found at Chaukham, Baitadi and Oroxylum indicum (right, found at Dhungad, Baitadi district.*

3.3 Three manuscripts were published/submitted with due acknowledgement to the Rufford Foundation, UK. One was published in The Florida Geographer journal http://journals.fcla.edu/flgeog/article/view/105573/101226 and two were submitted for publishing in Environment, Development and Sustainability journal and Biodiversity and Conservation Journal (see below).



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

As outlined in methodology, school children, their guardian and local communities were actively participated in meetings, discussions and trainings. District forest offices were also actively involved and supported to make this study a grand success of threatened plants of the area and their vulnerabilities and local conservation strategies.

Schools of Baitadi and Darchula were supported with education materials: reference books, stationery, a computer, and a shelf. Below attached was published in national daily news.

1. (http://nagarikplus.nagariknews.com/epaper/src/epaper.php?id=3175#page/23)

2. (http://sidharekha.com/2017/10/%E0%A4%B5%E0%A4%BF%E0%A4%A6%E0%A5%87%E0%A4%B6%E0%A4%AE%E0%A4%BE-%E0%A4%85%E0%A4%A7%E0%A5%8D%E0%A4%AF%E0%A4%AF%E0%A4%A8%E0%A4%B0%E0%A4%A4-%E0%A4%B5%E0%A4%BF%E0%A4%A6%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B0/


सहिदपार्क निर्माणको माग
स्वास्थ्य संस्था स्थानीय तहलाई
किशोरी सञ्जाल गठन
छाप्रोमा बस्ने अपाङ्गतालाई घर
विद्यालयलाई कम्प्युटर र दराज
अनौपचारिक शिक्षाको क्षेत्रीय गोष्ठी

*Discussion program about threats and conservation of plants at Bhagawati,*

*Support to Darchula district forest office (DFO, Sanjay Tiwari is receiving compliments).*

*Darchula, supported by Hira S Dhami).*

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

Since the Darchula is a semiarid mountainous district and local communities do practice several strategies such as transhumance, and collection and trade of high value medicinal plants to lowlands while migrating seasonally, the inventory and distribution modelling of high value medicinal plants of mountains (sky islands, above 3000 m) and assessment of their vulnerability and conservation would be an incentive to build the integrity between the ecology and socio-culture and harmony between the plants and people of the mountains.

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

As planned, some of the findings were shared in international peer reviewed journals (Biodiversity and Conservation, Environment, Development and Sustainability journal and The Florida Geographer). Some of the findings were shared with district forest offices for easing them to build local level action/management plans. A national level NTFP inventory was carried out by Department of Forests, Nepal and the assignment to be carried out in Dadeldhura, Baitadi and Darchula districts was facilitated by our team.

*DFO, Baitadi Prabhat Sapkota, collaborating communities and communicating critical species, call for conservation.*

*Highly threatened species Dactylorhiza hatagirea (Hathajadi), drying for voucher specimens (Santosh Thapa (left) assisted by Man S Dobal (herder, informant at right).*

Identification, distribution and conservation information was developed and distributed to district stakeholders. Once the papers get published and be online, they will be shared in social media.

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

Except some limitations with community consultations in Darchula district, the study was smoothly run along the scheduled time frame.

The first quarter and second quarters were used for field work and community consultations. The second was used for data compilation, analysis. The third one was used for data and voucher specimen management, plant vouchers were deposited at KATH herbarium, Nepal, information was shared at local scales and the fourth quarter was used to prepare manuscripts and submit to the journals for worldwide circular.

**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 |
|---|---|---|---|---|
| Travel (US-Nepal-US) | 1000 | 1100 | -100 | |
| Travel Kathmandu and field | 600 | 500 | +100 | Baitadi and Darchula districts as field and DPR, KATH, DoF, DNPWC from Ktm were visited. |
| Field, school programs | 750 | 840 | -90 | 3 schools from Baitadi and 2 schools from Darchula were accessed. |
| Field accommodation | 1000 | 1160 | -160 | Field work was carried out between February and May 2017 (Feb-April in Baitadi April-May in Darchula) |
| GPS | 100 | 160 | -60 | 2 GPS were bough and donated to DFOs. |
| Camera power back up, multimedia, hall charges | 200 | 150 | +50 | Power ban/back up was bought and left for field assistant SRB |
| Sample management | 50 | 45 | +5 | NPR 6700 was paid to KATH, DPR. |
| Habitat mapping, harvesting guideline | 500 | 400 | +100 | GIS analyst Ramashray Yadav also helped me |
| Manuscripts | 140 | 100 | +40 | 3 manuscripts were prepared and 1 was already published. |

| | | | | |
|---|---|---|---|---|
| Communication | 100 | 80 | +20 | Nepal Telecom data pack was used for communication in field. |
| Miscellaneous | 440 | 400 | +40 | Communities and DFOs were supported/equipped for monitoring |
| Total | 4880 | 4935 | -55 | Net = deficit 55 |

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

Working with communities is a privilege and a scholarly work because at the same time, we can carry out study, have fun with indigenous system and help them update, communicate with outside world.

Since some of the communities are highly dependent on natural resources (particularly medicinal plants) because of the geographical constraints, and limited access to modern days' amenities. Identifying local potential food and medicinal plants complement their livelihood and primary health care and conserving these plants help ensures the sustainability of both indigenous system and biological diversity. Within the context, participatory inventory and conservation of all threatened medicinal plants of the high altitude areas (sky islands) is worthwhile. Since some the high value medicinal plants like *Ophiocordycepns sinensis* (Himalayan caterpillar fungus) were highly overexploited and some of the other high value plants are verged into threatened in the premises of declining Himalayan caterpillar fungus.

*Local threat: Field camp at Byansh, Darchula for collection of Himalayan caterpillar fungus, a high value medicinal plant of mountain communities.*

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

Yes, we used logo while presenting and discussing with communities. This news writes the acknowledgement of Rufford Foundation. Submitted manuscripts contains acknowledgements to RSGF.

http://sidharekha.com/2017/10/%E0%A4%B5%E0%A4%BF%E0%A4%A6%E0%A5%87%E0%A4%B6%E0%A4%AE%E0%A4%BE-%E0%A4%85%E0%A4%A7%E0%A5%8D%E0%A4%AF%E0%A4%AF%E0%A4%A8%E0%A4%B0%E0%A4%A4-%E0%A4%B5%E0%A4%BF%E0%A4%A6%E0%A5%8D%E0%A4%AF%E0%A4%BE%E0%A4%B0/

*Shiv R Bhatta, helping discuss about the conservation status of medicinal plants in Baitadi*

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

| Team members | Job/Location | Assignment |
|---|---|---|
| Naren Bhat<br>Prem Bhat | School Teachers: Siddeshwor School, Hukkedada, Baitadi | They facilitated me to carry out community consultation and 3 school programs. SRB helped in field work. |
| Hira S Dhami | Khalanga School & | Facilitated community consultations |

| | | |
|---|---|---|
| | Darchula School | and 2 school programs. |
| Prabhat Sapkota<br>Ram P Chaudhary<br>Dinesh Thakur | District Forest Officer, Baitadi | Helped me in obtaining local consents and organizing local meetings with communities. Ranger Dinesh Thakur was with me in field to assess the vulnerability of target species. |
| Sanjay Tiwari | District Forest Officer: Darchula | Helped me in obtaining local consents and organizing local meetings with communities and stakeholders. |
| Asmita Thapa<br>Santosh Thapa | Fieldworkers | Helped to carry out field work |
| Laxmi Mahat | Co-ordinator: Kathmandu | She helped me to coordinate works to be carried out in Kathmandu. |
| Prof. Dr. Keshab Shrestha | Kathmandu | Discussed about the field situation, species occurrence, clusters and methodologies of mapping/ vulnerability assessment. |
| Prof. Dr. Rainer W Bussmann | WLBC, USA | We shared idea of project design, implementation and sharing/ publishing in international journals. |

**12. Any other comments?**

I would like to express my sincere thanks to RF for supporting me to undertake the study of inventory, mapping, raising awareness and participatory conservation of useful and threatened plants of Baitadi and Darchula districts, Nepal. Without the support, the findings I submitted hereby and presented in submitted manuscripts would not be in the present shape and order. The support was really helpful for obtaining such a vast knowledge and interesting in documenting the database and distribution of useful and threatened species. It is worth noting that there are about 50% (122 out of 255 species) useful species in Baitadi and Darchula districts and their distribution, uses, management and threats were varied spatially and culturally. However, the detail analysis is yet to be carried to analyse the distribution, uses, management and threats of useful plant species at spatial, temporal and cultural scales.

If we relook the traded species of the area and review the present local conservation status of the plant species, some of the species really are in great peril and the associated indigenous knowledge is gradually disappearing curtailed by sociocultural transformation (outmigration), land use change (left land unattended) and climate change (temp and rainfall increasing). Inventory and conservation of those useful threatened plant species which are being constrained by their own restricted distribution in high altitude areas (sky islands) is deemed necessary because their extinction jeopardizes the extant communities of plants and human and their sustainability in mountains.

To sum up, the grant was quite helpful in collecting the most useful information of species, users and habitats for sustainability; collaborating a wider network ranges from local people to researchers to district forest officers to international readers/donors; and conserving the threatened plant species from the scales of policy to practices and communities to conservationists. Since the area is featured with limited access and modern amenities, building capacities of locals in capitalizing the local resources is utmost in the context of changing land use, climate and socio-culture. Cataloguing the species, computing their scopes and threats, capacitating the communities and conserving the critical species is immediate in the mountainous areas (sky islands) where the livelihood is solely dependent on local resources.