FINAL ACTIVITY REPORT

Guidelines on how to complete the activity report are included in italics.

Remember that this report will be made available on your project page on the GBIF website and therefore should not include email addresses, unless you have permission from all mentioned in the report that their email information can be published.

Contents

Project information

Main contact person and role:	**Bharat Babu Shrestha, Project coordinator**
Institution/network/agency affiliation:	**Central Department of Botany, Tribhuvan University, Kathmandu**
BIFA Project ID:	**BIFA3_25**
Project title:	**Mobilizing occurrence data of alien and endemic plant species of Nepal**
Start date and end date of the reporting period:	**May 2018 – May 2019**
Country in which the activities take place:	**Nepal**

Executive summary

Provide a brief explanation of the project and its implementation, the context and the approach taken for the final evaluation, and a summary of the objectives achieved, lessons learned and conclusions.

Alien and endemic species lies at the two opposite ends of a spectrum representing population dynamics of the organisms. By crossing natural biogeographic barriers, the alien species has dispersed outside of their native distribution range, and rapid population expansion of some of these alien species (also called 'invasive') has created multitude of problems that ranges from biodiversity loss, altered ecosystem process to negative human health impacts. Whereas, the endemic species have high conservation value (priority) due to their small population size and restricted geographic distribution. Herbarium specimens of these alien and endemic plant species have been collected and managed in two indexed herbaria of Nepal – National Herbarium and Plant Laboratories (KATH) (which is being managed by the Department of Plant Resources, DPR) and Tribhuvan University Central Herbarium (TUCH) (which is being managed by the Central Department of Botany, Tribhuvan University, CDB TU). In this project, these two institutions (DPR and CDB TU), in association with the Royal Botanic Garden Edinburgh (RBGE), has collaborated to digitize herbarium specimens of alien and endemic plant species and publish the occurrence data in GBIF. The lead institution of this project is CDB TU and the project team included three members each from CDBTU and DPR. In addition, two research assistants were hired for seven months to help capturing data including herbarium photography. There was co-funding from RBGE for the collection of herbarium specimens of alien species (81 specimens of 23 species) from western Nepal. Additional 540 specimens were contributed to TUCH voluntarily by graduate students and researchers at the CDB, TU.

The project activities and outcomes were communicated among partner institutions and other stakeholders during two meetings – Inception Workshop at the beginning of the project and Results Sharing Meeting at the end. During the project implementation period, the Project Coordinator regularly updated the activities in the meetings of the project team and also through email messages. In each meeting, we reviewed the progress of the project implementation. Final evaluation of the project was done in a meeting of the project team members. The project was considered successful in publishing data in GBIF as all the occurrence data captured during the project period have been already published in GBIF. The final report was drafted by project coordinator and circulated among project team members. The report was finalized after incorporating comments and suggestions from the members. The project team decided to submit final report to BIFA and continue working on data papers and other deliverables.

In this project, we digitized 5266 specimens of alien plants (TUCH:1753; KATH: 3513) and 304 specimens of endemic plants (TUCH: 30; KATH: 274). The occurrence data obtained from this digitization have been managed in four dataset (two (alien and endemic) for each of TUCH and KATH) and published in GBIF. The data set of TUCH has been published using Integrated Publishing Toolkit (IPT) of the Taiwan Biodiversity Information Facility (TaiBIF) and the dataset of KATH using IPT hosted by International Center for Integrated Mountain Development (ICIMOD). In addition to digitization of herbarium specimens, we also compiled herbarium information of the endemic species to prepare a 'Herbarium Catalogue of the Endemic Plants of Nepal'. We have extracted data from 1930 herbarium specimens which have been managed by 52 herbaria located in 19 countries. We are extracting data of previously digitized specimens

from KATH database and plan to complete this by the end of August 2019. The draft of the Catalogue will be reviewed by two experts. After expert review and formatting, we will publish this Catalogue in November 2019. Similarly, we will prepare manuscripts of two data papers and submit to journals by the end of December 2019.

During the implementation of the project, we learned some important lessons. We realized that it is necessary to make plant collectors, particularly the graduate students and early carrier researchers, aware of the value of recording vital information at the time of plant collection. Incomplete information reduces the use value of the data and herbarium specimens. Similarly, protection and proper management of herbarium specimens is as important as the collection; OLD IS GOLD perfectly applies here. We also understood that collection of specimens is just the first step; there are several steps to be crossed to make the data visible and usable to the rest of the world. In conclusion, a small effort to publish data in GBIF will increase the use value of our collections and let the rest of the world know the huge effort we made for collection and maintenance of plant specimens.

Project objectives

This section should include the list of objectives included in your original project proposal, stating for each how far you advanced towards their achievement. Also include any additional objectives that were defined during the implementation of the project. In the event of undexpected challenges prevented you to reach a planned project objective, please provide detailed explanations and indicate how you plan to reach these objectives post project.

The general objectives of this project is to mobilize occurrence data of alien and endemic plant species of Nepal to fill geographic gap and inform policy process for the conservation of biodiversity. Within this broad framework, we aimed to 1) digitize herbarium specimens of alien and endemic plant species of Nepal that have been deposited in two national institutions - Tribhuvan University Central Herbarium (TUCH) and National Herbarium and Plant Laboratories (KATH); 2) Publish occurrence data in GBIF; 3) prepare herbarium catalogue of alien and endemic plants of Nepal; and 4) prepare of data papers based on the occurrence data.

We completed work related to first two objectives. We published occurrence data of 146 alien plant species based on 5266 herbarium specimens and 48 endemic plant species based on 304 specimens. Though these numbers are less than the number we initially planned (8000 for alien and 600 for endemic), we checked all the specimens (deposited in TUCH and KATH) and included in database. Before, we started this project, the KATH has already digitized >100 specimens of endemic plants. We also excluded duplicate collections from the same site at the same time.

The third objective included the preparation of catalogue of herbarium specimens of alien and endemic plants of Nepal. Project committee members discussed on this objective and thought that catalogue of the herbarium specimens of alien species is not that much important. Therefore, we decided to prepare catalogue only for endemic species. We finished collecting data from 52 herbaria located in 19 countries including Nepal. Data were extracted from GBIF as well as the online database of the individual institutions. We have compiled data from 1930 herbarium specimens of the endemic species of Nepal. We are extracting additional data of previously digitized specimens from KATH database and plan to complete this by the end of August 2019. After expert review and formatting, we will publish this Catalogue in November 2019.

The fourth and the last objective includes publication of data paper and we plan to submit manuscript of data papers by the end of December 2019.

Activities

Please indicate the status of the activities as outlined in the project proposal, at the time of final reporting. The table below should be completed in the same way as in the full proposal but should include information and updates on the status of each activity.

In the event of unexpected delay please provide detailed explanatory notes and indicate planned completion date after the end of the project. Add as many rows as needed.

In the event of any additional activities having being completed during the implementation of the project, please add rows as required.

Description of activity	Partners involved	Contribution of activity to goals listed in table 4.3	Status of activity as of final reporting Completed? Yes/No	Explanatory notes, inc. planned completion date if necessary	Source(s) of verification
Digitizing and publishing georeferenced species occurrence data based on specimens held in Asian collections					
Updating and validation of checklists of the alien and endemic plant species	CDB-TU, DPR, RBGE	Final list of species for digitization	Yes	-	Appendix 1 and 2
Digital photography of herbarium specimens	CDB-TU, DPR	Specimens digitized	Yes	-	Digital archive at TUCH and KATH
Database preparation (data entry) and curation	CDB-TU, DPR	Database prepared	Yes	-	
Publication of data in	CDB-TU,	Publication	Yes	-	https://www.gbif.org/project/3IvP2nISis66g6ceka6C8e/mobilizing-occurrence-

Description of activity	Partners involved	Contribution of activity to goals listed in table 4.3	Status of activity as of final reporting Completed? Yes/No	Explanatory notes, inc. planned completion date if necessary	Source(s) of verification
GBIF.org	DPR	of data			data-of-alien-and-endemic-plant-species-of-nepal#datasets
Compiling inventories of biodiversity data holdings (for example, by implementing metadata catalogues)					
Preparation of catalogue of herbarium specimens of endemic plants of Nepal	CDB-TU, DPR, RBGE	Publication of data	Compilation of information completed; formatting in process; expert review to be done.	We plan to publish catalogue by end of November 2019.	
Preparing data papers					
Submission of data papers	CDB-TU	Publication of data paper	No.	Planned to complete in December 2019.	
Other activity types					
Field collection of plant specimens from the regions which have been poorly recorded in the past [Co-	CDB-TU, DPR, RBGE	Final list of species for digitization	Yes	-	Photographs; presentation of result sharing meeting; herbarium specimens collected.

Description of activity	Partners involved	Contribution of activity to goals listed in table 4.3	Status of activity as of final reporting Completed? Yes/No	Explanatory notes, inc. planned completion date if necessary	Source(s) of verification
funding]					
Inception workshop at the beginning of the project	CDB-TU, DPR	Digitization and publication of data	Yes	-	Photographs; attendance of participants; reports of the meeting
Result sharing meeting at the end of the project	CDB-TU, DPR	Digitization and publication of data	Yes	-	Photographs; attendance of participants; reports of the meeting

Deliverables

This section should summarize the project deliverables completed by the final reporting date, with a description of the associated outputs. Please highlight any changes from the original plans provided in the full project proposal.

In the event of unexpected delay, please provide detailed explanatory notes and indicate planned completion date. Add as many rows as needed.

In the event of any additional deliverables having being completed during the implementation of the project, please add rows as required.

a. Data

Details of datasets mobilized and/or pending mobilization as an outcome of the project: Please use list from mid-term report and update this as at final reporting.

If the dataset is not yet published, please indicate it as "not published" and provide a detailed explanation and expected date of publication. Add rows as required.

Title of dataset	Taxonomic/geographic scope	Approximate number of records (specimens)	Current format (e.g. undigitized, digitized)	Status of dataset: Published/not published – inc. date/expected date of publication	Explanatory notes	DOI or URL
Alien Flora of Nepal at TUCH	All vascular plants; Nepal	1753	Digitized	Published		https://www.gbif.org/dataset/8af571a4-135f-4ca0-acd8-16983cf6ee77
Alien Flora of Nepal at KATH	All vascular plants; Nepal	3513	Digitized	Published		https://www.gbif.org/dataset/95a336b6-e4f6-401d-9cbe-a4aef935d82b
Endemic Flora of Nepal at TUCH	All vascular plants; Nepal	30	Digitized	Published		https://www.gbif.org/dataset/de7fe7a1-1ceb-4302-adb6-f7b64686a86f
Endemic Flora of Nepal at KATH	All vascular plants; Nepal	274	Digitized	Published		https://www.gbif.org/dataset/f7fc8184-1ca5-4ff2-98a6-59aab751b5bb

b. Other deliverables

Describe other deliverables (e.g. publication of data papers, catalogues, reports etc.). produced and/or planned to be produced as a post-project deliverable. Please provide indicative dates/estimated time for completion for planned post-project deliverables.

Please provide links in the sources of verification. Attachments should be provided in the Annex.

Name and type of deliverable	Status of deliverable Published/not published – inc. date/expected date of publication or estimation of time for completion	Explanatory notes	Source(s) of verification
Occurrence data of alien plant species of Nepal [Data paper]	Not published; planned to submit for publication in journal in December 2019	We have selected journal and we will start preparing daft of data paper soon.	
Occurrence data of endemic plant species of Nepal [Data paper]	Not published; planned to submit for publication in journal in December 2019	We have selected journal and we will start preparing daft of data paper soon.	
Catalogue of herbarium specimens endemic plants of Nepal	Not published; planned to publish by November 2019	Project committee members discussed on this deliverable and thought that catalogue of the herbarium specimens of alien species is not that much important. Therefore, we decided to prepare catalogue only for endemic species.	

Calendar of activities

The calendar should be completed in the same way as in the Full Project Proposal (4.6) but should include any changes. Please provide reasons for any changes in the Notes column in the table below.

Proposed dates	Activity	Lead partner	Notes
May 2018	Review of literatures to prepare checklist of alien (invasive and naturalized) and endemic plant species of Nepal	CDB-TU, DPR	Inception workshop planned in May 2018 could not be organized due to delay in official process of permission from Tribhuvan University and signing on the document
June 2018	Attendance of project team member at BIFA Capacity Enhancement Workshop		
July 2018	Inception workshop among partner institutions and other stakeholders	CDB-TU, DPR	Inception workshop initially scheduled for May was organized on 6 July 2018
August-September 2018	Examination of herbarium specimens deposited at TUCH (CDB-TU) and KATH (DPR); consultation with international herbaria	CDB-TU, DPR, RBGE	Herbarium examination began from August; information from international herbarium extracted during 2nd week of September due to delay in recruitment of Research Assistants
September 2018	Plant collection field work	CDB-TU, DPR, RBGE	
October 2018-February 2019	Herbarium digitization and database management	CDB-TU, DPR	Geo-referencing of occurrence locations without geographic coordinates in original collection took nearly one month (February 2019)
March 2019	Processing herbarium photographs	CDB TU	
April – May 2019	Data cleaning, validating and formatting in Darwin Core (DwC) standard; organization of Results Sharing Meeting	CDB-TU, DPR	Formatting of TUCH data completed; formatting KATH data ongoing; Result Sharing Meeting organized on 22 May 2019
June-July 2019	Formatting KATH data; publication of all occurrence data in GBIF	CDB-TU, DPR	

August 2019	Submission of complete final report; compilation of data for Herbarium Catalogue of Endemic Plants of Nepal completed.	CDB-TU, DPR	Planned activities
Sept.-Oct. 2019	Preparation of 2-page summary document for stakeholders and policy makers; review of Catalogue by experts; drafting manuscript of data papers.	CDB-TU, DPR	Planned activities
Nov. 2019	Publication of Herbarium Catalogue of Endemic Plants of Nepal; review of manuscript of data papers by co-authors	DPR, CDB-TU	Planned activities
Dec. 2019	Submission of data papers	CDB-TU, DPR	Planned activities

a. General explanatory notes

[Insert text here]

Project communications and visibility

Describe the way the results of your project have been and will continue to be communicated and shared with the project stakeholders and broader GBIF community. Please also review the page describing your project available from http://www.gbif.org/programme/bifa . Highlight any additional documents, events, news items or links that you would like to add to your page and provide links/attachment in the Annex.

Project activities and outcomes have been communicated in following ways:

1) Project objectives and planned activities shared among stakeholders during an inception workshop on July 2018. Report of the workshop has been already published online in the project.
2) Project outcomes were shared among stakeholders during a Result Sharing Meeting organized on May 2019. Brief report of the Meeting has been included in this report.
3) Link to online data base of the occurrence data published in GBIF was shared among participants of the workshop by email and publicly in social media such as Facebook.
4) Publication of project activities in *Vanaspati* (issue no. 17; Nov 2018), a newsletter of the Central Department of Botany, Tribhuvan University. Similarly, the project activities have been also published in a newsletter of the Department of Plant Resources (vol. 22, issue 1, Nov 2018). Information published in these newsletters have been included as Annex 3 in this report.

Following are the future plan for sharing the outcomes of the project:

1) Publication of data papers in peer reviewed journals

2) News reporting in national daily newspapers after publication of occurrence data in GBIF

3) Publication of two-page summary document for distribution among stakeholders and policy makers

Final evaluation findings and conclusions

This section of the report should cover for example:

- *An evaluation of the project activities and their outputs/deliverables*
- *An assessment of the overall outcomes, impacts of the project and how it contributes to the overall objective of the BIFA programme*
- *Comments on the project implementation and completion, and its efficiency and effectiveness, strength and weaknesses etc.*
- *Any feedback on the project's relevance from the partners and stakeholders*
- *Indications and reasons for any changes which have been made to the project's original plans, and actions to follow-up*
- *The management arrangements for the project, including support from the GBIF Secretariat*
- *Areas of success to build on, after the project's implementation period*
- *Conclusions from your experience during the implementation of the project*

Project activities and their outputs/deliverables: Overall we completed major activities that had been initially planned and some remaining activities will be completed in future. We digitized all the specimens of the alien and endemic plant species of Nepal that has been managed in two national institutions (TUCH and KATH). During the project period, there was addition of 621 specimens of alien plants in TUCH through co-funding and voluntarily by graduate students and researchers. Though the total number of specimens we digitized is less than the number mentioned in the proposal, we have included all the specimens with adequate information for digitization and databasing. Both partner institutions (Central Department of Botany, Tribhuvan University – which is managing Tribhuvan University Central Herbarium TUCH, and Department of Plant Resources – which is managing Nationals Herbarium and Plant Laboratories, KATH) have been registered in GBIF as data publisher. All the occurrence data captured during the project period have been managed in the form of four dataset and published in GBIF. We will prepare manuscript of two data papers for submission in pee reviewed journals. We have almost finished compiling information for the preparation of the Catalogue of Herbarium Specimens of Endemic Plant of Nepal. This document will soon be sent to experts for review. After evaluation by experts, the Catalogue will be sent for formatting and publication.

Project impacts and contribution to the objective of the BIFA programme: The project has significant impacts on popularizing GBIF as a sources of valuable biodiversity information (through two meetings organized during the project period with participants from major stakeholders working on biodiversity), infrastructure development for herbarium digitization in TUCH, and capacity building of personnel in TUCH and KATH in handling biodiversity data. We started digitization of herbarium specimens during this project in TUCH which is a historic event for this institution. Altogether, 5570 occurrence data of 194 plant species have been added in GBIF from Nepal. This is also the first event of publication of any occurrence data from the publishers located in Nepal. These events have filled the geographic gap on the occurrence data, to some extent, and also expanded GBIF network in Nepal.

Strength and weaknesses: Strength of the project included 1) collaboration between government and academic institutions which are managing internationally recognized herbaria (KATH and TUCH, 2) co-funding for collection of

additional herbarium specimens representing less explored areas from the partner institution (RBGE, UK), and 3) voluntary contribution of herbarium specimens by graduate students and researchers in TUCH. The major weakness of the project was our inability to complete project activities within the stipulated time. Late approval of the project from the authority of Tribhuvan University, change in project member from partner institution (Mr. Tirtha Raj Pandey of DPR was replaced by Ms Sajita Dhakal after Mr. Pandey travelled abroad for further study), and lack of experience of managing data and publishing in GBIF were the major factors responsible for our inability to complete activities in time.

Feedback from the partners and stakeholders: Major stakeholders working in areas of biodiversity conservation participated the inception workshop as well as the results sharing meeting of this project. They praised the collaboration between two national institutions holding herbarium specimens for mobilizing occurrence data of alien and endemic plants. In addition to general comments, they emphasized the need of additional funding by the government to continue the process of digitizing biodiversity data and their publication. Some of them also suggested to undertake georeferencing of the historical collections, for which geographic coordinates have been missing in the original collection.

Changes in project plan: The project activities could not be completed within the stipulated time frame due to the reasons mentioned above as weakness of the project. The major activities yet to be completed are 1) publication of the data papers, and 2) publication of the Herbarium Catalogue of the Endemic Plants of Nepal. Now, we pledge to complete all these activities by the end of December 2019.

Management arrangements and support from the GBIF Secretariat: Project Management Committee formed at the Central Department of Botany, Tribhuvan University with representative from the Department of Plant Resources has been facilitating the implementation of the project activities. There was also regular meeting and communication among project team members. The project coordinator regularly updated the activities among project team members. The GBIF secretariat has been always supportive. Members of the BIFA coordination team responded to email queries timely. Most importantly, they helped us to find data hosting institution (IPT of TaiBIF) and mentor (Manash Shah of GBIF Sweden) for technical support in data management. These supports from BIFA coordination team has been very important for the success of the project.

Areas of success to build on: At the end of project, we have four dataset published in GBIF by two publisher institutions from Nepal. After completion of this project, both partner institutions in Nepal will continue to digitize herbarium for publication of occurrence data in GBIF. Some of the project team members from both institutions are now well familiar with the process of data capturing, managing data in Darwin Core format, and publishing database in GBIF.

Conclusions from your experience during the implementation of the project: Small effort to publish data in GBIF will increase the use value of our collection and let rest of the world know the huge effort we made for collection and maintenance of plant specimens. Working on biodiversity data requires lots of patience and time, and this is very difficult to manage especially when one also has other major professional responsibilities. However, supportive team and enthusiastic research assistants can make the work on biodiversity data a fun. Several lessons have been learnt and

strength and weakness of the present project implementation have been identified. Considering them in project planning and execution may substantially increase the success of similar projects in future.

Sustainability plans

Please provide a description of how the partners involved will build on the results of this project in their future work. This could include future collaborative activities, such as plans to complete any unfinished project activities and how the future impact of the project could be monitored and/or measured.

The Central Department of Botany, Tribhuvan University (CDB TU) and the Department of Plant Resources (DPR) have agreed to continue collaboration in digitization and publication of herbarium database. The DPR has prioritized the digitization of herbarium specimens under the 'Prime Minister Program' and targeted to digitize 30,000 specimens in 2019. Online publication of herbarium images and associated data have been also planned by the DPR. Similarly, the CDB TU is also exploring for additional funding to continue herbarium digitization process. The CDB is also planning to publish survey data of the invasive alien plants in GBIF.

BIFA project team members from CDB TU and DPR are working closely to complete the remaining tasks of the project. BIFA project coordinator has been supervising DPR officials in the preparation of the Catalogue of Herbarium Specimens of the Endemic Plants of Nepal, and also provided support in cleaning, validating, formatting, and publishing occurrence data in GBIF. This will enable DPR team to handle occurrence data and publish in GBIF independently.

Recommendations and lessons learned

This section should describe your experiences that could help in designing and implementing biodiversity mobilization projects more effectively, including the best practices to adopt and the pitfalls to avoid.

Inclusion of information technology expert or bioinformatics specialist in project team is very important, particularly when rest of the team members are less proficient in digital data handling. Capturing biodiversity data, managing and formatting data, and publication in GBIF took longer time than we initially anticipated. It is particularly true when one is working on biodiversity data for the first time.

Specific lessons that we learned are:

- It is necessary to make plant collectors, particularly the graduate students and early carrier researchers, aware of the value of recording vital information at the time of plant collection. Due to lack of incomplete information related to collection locality, date, etc. we could not include some of the historic collections.
- Protection of herbarium specimen is as important as collection; OLD IS GOLD perfectly applies here.
- Collection of specimens is just the first step; there are several steps to be crossed to make the data visible and usable to the rest of the world.
- Small effort to publish data in GBIF will increase the use value of our collection and let rest of the world know the huge effort we made for collection and maintenance of plant specimens

Annex – Sources of verification

Sources of verification are for example links to relevant digital documents, news/newsletters, brochures, copies of agreements with data holding institutions, workshop related documents, pictures, etc.

Appendix 1. List of alien species naturalized in Nepal

SN	Name
1	*Acacia farnesiana*
2	*Acacia nilotica*
3	*Acanthospermum hispidum*
4	*Adenostemma brasilianum*
5	*Agave cantula*
6	*Ageratina adenophora*
7	*Ageratum conyzoides*
8	*Ageratum houstonianum*
9	*Alternanthera paronychioides*
10	*Alternanthera philoxeroides*
11	*Alternanthera sessilis*
12	*Amaranthus hybridus*
13	*Amaranthus spinosus*
14	*Amaranthus viridis*
15	*Anagallis arvensis*
16	*Aniseia martinicensis*
17	*Argemone Mexicana*
18	*Argemone ochroleuca*
19	*Axonopus compressus*
20	*Bidens biternata*
21	*Bidens pilosa*
22	*Biophytum sensitivum*
23	*Blainvillea acmella*
24	*Brachiaria mutica*
25	*Bromus catharticus*
26	*Brugmansia suaveolens*
27	*Caesalpinia bonduc*
28	*Capsella bursa-pastoris*
29	*Cardamine flexuosa*
30	*Cardiospermum halicacabum*
31	*Ceratophyllum demersum*
32	*Cestrum diurnum*
33	*Chamaecrista pumila*
34	*Chenopodium album*
35	*Chromolaena odorata*
36	*Cirsium arvense*
37	*Cissampelos pareira*
38	*Cleome gynandra*
39	*Cleome rutidosperma*
40	*Cleoserrata speciosa*
41	*Clitoria ternatea*
42	*Coccinia grandis*
43	*Convolvulus arvensis*
44	*Corchorus aestuans*
45	*Cosmos sulphureus*
46	*Crassocephalum crepidioides*
47	*Crotalaria pallida*
48	*Croton bonplandianus*
49	*Cryptomeria japonica*
50	*Cuphea procumbens*
51	*Cyanus segetum*
52	*Dactyloctenium aegyptium*
53	*Datura inoxia*
54	*Datura metel*
55	*Datura stramonium*
56	*Digera muricata*
57	*Drymaria cordata*
58	*Drymaria villosa*
59	*Duranta erecta*
60	*Dysphania ambrosioides*
61	*Echinochloa pyramidalis*
62	*Eclipta prostrata*
63	*Eichhornia crassipes*
64	*Eleocharis acutangula*
65	*Erigeron annuus*
66	*Erigeron canadensis*
67	*Erigeron floribundus*
68	*Erigeron karvinskianus*
69	*Erigeron bonariensis*
70	*Eucalyptus camaldulensis*
71	*Eupatorium cannabinum*
72	*Eupatorium capillifolium*
73	*Euphorbia heterophylla*
74	*Euphorbia hirta*
75	*Euphorbia hypericifolia*
76	*Euphorbia prostrata*
77	*Evolvulus nummularius*
78	*Galinsoga parviflora*
79	*Galinsoga quadriradiata*
80	*Galium aparine*
81	*Gnaphalium pensylvanicum*

82	*Gomphrena celosioides*
83	*Grevillea robusta*
84	*Hypoestes phyllostachya*
85	*Hyptis suaveolens*
86	*Ipomoea alba*
87	*Ipomoea carnea subsp. fistulosa*
88	*Ipomoea hederifolia*
89	*Ipomoea muricata*
90	*Ipomoea nil*
91	*Ipomoea purpurea*
92	*Ipomoea quamoclit*
93	*Jatropha curcas*
94	*Jatropha gossypifolia*
95	*Lantana camara*
96	*Lathyrus aphaca*
97	*Lathyrus odoratus*
98	*Leersia hexandra*
99	*Leonotis nepetifolia*
100	*Leucaena leucocephala*
101	*Lolium temulentum*
102	*Ludwigia hyssopifolia*
103	*Ludwigia octovalvis*
104	*Martynia annua*
105	*Mecardonia procumbens*
106	*Medicago sativa*
107	*Mikania micrantha*
108	*Mimosa pudica*
109	*Mirabilis jalapa*
110	*Myriophyllum aquaticum*
111	*Nasturtium officinale*
112	*Nicandra physalodes*
113	*Nicotiana plumbaginifolia*
114	*Oenothera glazioviana*
115	*Oenothera rosea*
116	*Opuntia monacantha*
117	*Opuntia stricta*
118	*Oxalis corniculata*
119	*Oxalis debilis*
120	*Oxalis latifolia*
121	*Parthenium hysterophorus*
122	*Paspalum conjugatum*
123	*Paspalum distichum*
124	*Passiflora caerulea*
125	*Passiflora edulis*
126	*Passiflora foetida*

127	*Pennisetum polystachion*
128	*Peperomia pellucida*
129	*Phalaris minor*
130	*Phyllanthus amarus*
131	*Physalis angulata*
132	*Physalis peruviana*
133	*Phytolacca americana*
134	*Phytolacca dioica*
135	*Pinus patula*
136	*Pistia stratiotes*
137	*Pithecellobium dulce*
138	*Populus tremula*
139	*Portulaca oleracea*
140	*Psidium guajava*
141	*Ricinus communis*
142	*Ruellia tuberosa*
143	*Sambucus nigra*
144	*Schoenoplectiella supina*
145	*Scoparia dulcis*
146	*Senna occidentalis*
147	*Senna septemtrionalis*
148	*Senna tora*
149	*Sesbania grandiflora*
150	*Sida acuta*
151	*Sida cordifolia*
152	*Sida rhombifolia*
153	*Solanum aculeatissimum*
154	*Solanum erianthum*
155	*Solanum glaucophyllum*
156	*Solanum jasminoides*
157	*Solanum mauritianum*
158	*Solanum myriacanthum*
159	*Solanum pseudocapsicum*
160	*Solanum sisymbriifolium*
161	*Solanum torvum*
162	*Solanum viarum*
163	*Solanum wendlandii*
164	*Soliva anthemifolia*
165	*Sonchus asper*
166	*Sorghum halepense*
167	*Spergula arvensis*
168	*Spermacoce alata*
169	*Sphenoclea zeylanica*
170	*Stellaria media*
171	*Synedrella nodiflora*
172	*Taraxacum campylodes*

173	*Tarenaya spinosa*
174	*Tithonia diversifolia*
175	*Tribulus terrestris*
176	*Tridax procumbens*

177	*Trifolium repens*
178	*Xanthium strumarium*
179	*Zephyranthes carinata*

Appendix 2. Checklist of the endemic plants of Nepal.

S.N	Family	scientific Name
1	Acanthaceae	Justicia tukuchensis V.A.W. Graham, J.Jap. Bot. 56:117 (1981).
2	Acanthaceae	Strobilanthes bheriensis (P.R. Shakya) J.R.I. wood, Edinb.j. Bot. 51 (4): 218(1994)
3	Acanthaceae	Strobilanthes nutans (Nees)T. Anders., j.Linn. Soc. Bot. 9 : 475 (1867)
4	Acanthaceae	Strobilanthes saccata J.R.I Wood, Edinb. J. Bot. 51: 256 (1994)
5	Acanthaceae	Thunbergia nepalensis BH. Adhikari & J.R.I. Wood, Kew Bull. 68(4):652 (2013).
6	Amaranthaceae	Chenopodium harae Sukhor., Phytotaxa 226(3): 290 (2015). 'harai'
7	Amaryllidaceae	Allium hypsistum Stearn, Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 188 (1960).
8	Apiaceae	Acronema bryophilum Farille & Lachard, Acta Bot. galli. 149(4): 373 (2002).
9	Apiaceae	Acronema cryptosciadeum Farille & Lachard, Acta Bot. galli. 149(4): 375 (2002).
10	Apiaceae	Acronema dyssimetriradiata Farille, Cauwet-Marc & S.B. Malla, Candollea 40 (2): 557 (1985).
11	Apiaceae	Acronema johrianum Babu, Brittonia 25:159 (9173).
12	Apiaceae	Acronema mukherjeeanum Farille & Lachard, Acta Bot. Galli. 149 (4): 373 (2002).
13	Apiaceae	Acronema phaeosciadeum Farille & Lachard, Acta Bot. Galli. 149 (4): 374 (2002).
14	Apiaceae	Acronema pneumatophobium Farille & Lachard, Acta Bot. Galli. 149 (4): 374 (2002).
15	Apiaceae	Acronema refugicolum Farille & Lachard, Acta Bot. Galli. 149 (4): 376 (2002).
16	Apiaceae	Conioselinum nepalense Pimenov &Kljuykov, Willdenowia 33:361 (2003).
17	Apiaceae	Cortia staintoniana Farille, Cauwet-Marc & S.B. Malla, Candollea 40 : 545 (1985).
18	Apiaceae	Cortiella lamondiana Fullarton & M.F. Watson, Edinb.J.Bot. 53 (1): 130 (1996).
19	Apiaceae	Dolpojestella shrestaeanum (Farille & Malla) Farille & Lachard, Acta Bot. galli. 149(4): 370 (2002).
20	Apiaceae	Keraymonia nipaulensis Farille, Cawet- Marc & S.B. Malla, Candollea 40 (2): 528 (1985).
21	Apiaceae	Keraymonia triradiata Farille, Cawet- Marc & S.B. Malla, Candollea 40 (2): 531 (1985).
22	Apiaceae	Lalldhwojia pastinacifolia Pimenov & Kljuykov, Willdenowia 32: 92 (2002).
23	Apiaceae	Lalldhwojia staintonii Farille, Rev. Gen. Bot. 91 (1076-78): 28 (1984).
24	Apiaceae	Oreocome depauperata Pimenov & Kljuykov, Willdnowia 31 : 120 (2001).
25	Apiaceae	Oreocome involucellata Pimenov & Kljuykov, Willdnowia 31 : 118 (2001).
26	Apiaceae	Pimpinella acronemastrum Farille & Lachard, Acta Bot. Galli. 149 (4): 379 (2002).
27	Apiaceae	Pimpinella inudata (Farille & S. B. Malla) P.K. Mukh. & Constance, Edin. J. Bot. 48: 44 (1991).
28	Apiaceae	Pimpinella kawalekhensis Farille & Lachard, Acta Bot. Galli. 149 (4): 378 (2002).
29	Apiaceae	Rohmooa kirmzii Farille & Lachard, Acta Bot. Galli. 149 (4): 377 (2002).
30	Apiaceae	Sinocarum normanianum (Cauwet- Marc & Farille) Farille, Candollea 40:561 (1985).
31	Apiaceae	Sinocarum staintonianum P.K. Mukherjee ex Farille & Lachard, Acta Bot. Galli. 149 (4): 378 (2002).
32	Apiaceae	Synclinostyles denisjordanii Farille & Lachard, Acta Bot. Galli. 149 (4): 376 (2002).
33	Apiaceae	Synclinostyles exadversum Farille & Lachard, Acta Bot. Galli. 149 (4): 377 (2002).
34	Apiaceae	Tetrataenium lallii (C. Norman) Cauwet, J. Carbonnier & M. Farille, Candollea 37(2): 558 (1982).
35	Apiaceae	Vicatia nepalensis Pimenov, P.K. Mukh. & Kljuykov, Feddes Repert. 102: 377 (1991).
36	Apocynaceae	Brachystelma nepalense (A. R. Sm.) Meve, Kew Bull. 52 (4): 1012 (1997).
37	Apocynaceae	Ceropegia meleagris H. Huber, Mem. Soc. Brot. 12: 48 (1957).

38	Apocynaceae	Ceropegia poluniniana Bruyns, Kew Bull. 44: 723 (1989).
39	Asparagaceae	Asparagus penicillatus H. Hara, J. Jap. Bot. 49: 134 (1974).
40	Asteraceae	Artemisia mustangensis Yonek. In Ohba et al.,Fl. Mustang, Nepal: 339 (2008)
41	Asteraceae	Artemisia nepalica Yonek. In Ohba et al.,Fl. Mustang, Nepal: 346 (2008)
42	Asteraceae	Cicerbita nepalensis Kitam., Acta Phytotax. Geobot. 30: 127 (1979).
43	Asteraceae	Cirsium flavisquamatum Kitam., Acta Phytotax. Geobot. 26: 16 (1974).
44	Asteraceae	Cirsium phulchokiense Kitam., Acta Phytotax. Geobot. 26: 16 (1974).
45	Asteraceae	Crepis himalaica Kitam., Acta Phytotax. Geobot. 15: 106 (1954).
46	Asteraceae	Leontopodium makianum., Acta Phytotax. Geobot. 15: 78 (1953).
47	Asteraceae	Leontopodium montisganeshii S. Akiyama, Bull. Natn. Sci. Mus., Tokyo, Ser. B. 25(1): 1 (1999)
48	Asteraceae	Saussurea bhutkesh K. Fujikawa & H. Ohba, Edinb. J. Bot. 59: 283 (2002).
49	Asteraceae	Saussurea chrysotricha Ludlow, Bull. Brit. Mus. (Nat. His.), Bot. 2: 70 (1956).
50	Asteraceae	Saussurea dhwojii Kitam., Acta Phytotax. Geobot. 30: 128 (1979)
51	Asteraceae	Saussurea kanaii K. Fujikawa & H.Ohba, Edinb. J. Bot. 59 (2): 286 (2002).
52	Asteraceae	Saussurea linearifolia Ludlow, Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 72 (1956).
53	Asteraceae	Saussurea platyphyllaria Ludlow, Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 73 (1956).
54	Asteraceae	Saussurea ramchaudharyi S.K. Ghimire and H.K. Rana
55	Asteraceae	Saussurea rolwallingensis K. Fujikawa & H. Ohba, J. Jap. Bot. 82(6): 328 (2007).
56	Asteraceae	Senecio brunneo -villosus Kitam., Acta Phytotax. Geobot. 30: 129 (1979).
57	Asteraceae	Senecio topkegolensis Kitam., Acta Phytotax. Geobot. 32: 140 (1981).
58	Asteraceae	Synotis managensis S. Joshi, Kanti Shrestha & D. Bajracharya, Pleione 7(2): 542 (2013).
59	Asteraceae	Synotis panduriformis C. Jeffrey & Y. L. Chen, Kew Bull. 39: 287 (1984).
60	Asteraceae	Taraxacum amabile van Soest, Wentia 10: 8 (1963).
61	Asteraceae	Taraxacum nepalensis van Soest, Bull. Brit. Mus. (nat. Hist.) Bot. 2: 271 (1961).
62	Asteraceae	Taraxacum staintonii van Soest, Wentia 10: 54, t.25 (1963)
63	Balsaminaceae	Impatiens arunensis Grey-Wilson, Kew Bull. 44: 65 (1989).
64	Balsaminaceae	Impatiens bajurensis S. Akiyama & H. Ohba, J. Jap. Bot. 68: 157 (1993).
65	Balsaminaceae	Impatiens gorepaniensis Grey-Wilson, Kew Bull. 44:715 (1989).
66	Balsaminaceae	Impatiens harae H. ohba & S. Akiyama, J. Jap. Bot. 62 (12): 368 (1987).
67	Balsaminaceae	Impatiens kathmanduensis Grey-Wilson, Kew Bull. 44 (1): 119 (1989).
68	Balsaminaceae	Impatiens kharensis S. Akiyama, H. Ohba & Wakabaya. in Ohba & Malla, Himal. PL. 2: 75 (1991).
69	Balsaminaceae	Impatiens mallae S. Akhiyama & H. Ohba, J. Jap. Bot. 67: 187 (1992)
70	Balsaminaceae	Impatiens recticalcarata S. Akiyama, Bull. Natl. Mus. Nat. Sci., Tokyo, B. 35(2): 51 (2009).
71	Balsaminaceae	Impatiens scullyi Hook. F., Rec. Bot. Surv. Ind. 4: 15 & 21 (1905).
72	Balsaminaceae	Impatiens williamsii H. Hara, J. Jap. Bot. 47: 142 (1972)
73	Begoniaceae	Begonia flagellaris H. Hara, J. Jap. Bot. 48: 358 (1973)
74	Begoniaceae	Begonia leptoptera H. Hara, J. Jap. Bot. 48: 98 (1973)
75	Begoniaceae	Begonia minicarpa H. Hara, J. Jap. Bot. 47: 112, f.2 (1972)
76	Begoniaceae	Begonia nuwakotensis S. Rajbhandary, Gard. Bull. Sing. 62(1): 144 (2010)
77	Begoniaceae	Begonia panchtharensis S. Rajbhandary, Gard. Bull. Sing. 62(1): 147 (2010)
78	Begoniaceae	Begonia taligera S. Rajbhandary, Gard. Bull. Sing. 62(1): 150 (2010)
79	Begoniaceae	Begonia tribensis C. R. rao, J. Bombay Nat. hist. Soc. 65: 724 (1969).
80	Berberidaceae	Berberis mucrifolia Ahrendt, J. Roy. Hort. Soc. Lond. 81: 135 (1956).
81	Berberidaceae	Berberis pendryi Bh. Adhikari, Edinb. J. Bot. 69: 477 (2012).
82	Boraginaceae	Arnebia nepalensis (Kitam). H. Hara et al., Enum. Fl. Pl. Nepal 3: 99 (1982).
83	Boraginaceae	Microula mustangensis Yonek. In Ohba et al., Fl. Mustang, Nepal: 244 (2008).

84	Boraginaceae	Onosma bheriense H. Hara, J. Jap. Bot. 51: 10 (1976)
85	Boraginaceae	Onosma verruculosum I. M. Johnst., J. Arb. Arb. 32: 356 (1951)
86	Boraginaceae	Onosma wallichianum (A. DC.) Benth. Ex C. B. Clarke in Hooker, Fl. Brit. Ind. 4: 179 (1883).
87	Brassicaceae	Aphragmus hinkuensis (Kats. Arai, H. Ohba & Al-Shehbaz) Al-Shehbaz & S.i. Warwick, Can. J. Bot. 84: 279 (2006)
88	Brassicaceae	Aphragmus nepalensis (H. Hara) Al-Shehbaz, Harvard Pap. Bot. 5(1): 112 (2000)
89	Brassicaceae	Draba macbeathiana Al-Shehbaz, Novon 12(3): 315 (2002).
90	Brassicaceae	Draba poluniniana Al-Shehbaz, Harvard Pap. Bot. 8(2): 17 (2004).
91	Brassicaceae	Draba staintonii Jafri ex H.Hara in Hara & Williams, Enum. Fl. Pl. Nepal 2: 42 (1979).
92	Brassicaceae	Lepidostemon williamsii (H. Hara) Al- Shehbaz, Edinb. J. Bot. 59 (3): 446 (2000).
93	Brassicaceae	Noccaea nepalensis Al- Shehbaz, Adansonia, Ser. 3, 24 (1): 89 (2002).
94	Brassicaceae	Solms-laubachia haranensis (Al-Shehbaz) J.P. Yue, Al-Shehbaz & H. Sun, Ann. Missouri Bot. Gard. 95: 534 (2008).
95	Brassicaceae	Solms-laubachia nepalensis (H.Hara) J.P. Yue, Al-Shehbaz & H. Sun, Ann. Missouri Bot. Gard. 95: 535(2008).
96	Campanulaceae	Codonopsis bragaensis Grey-Wilson, Plantsman 12 (2): 99 (1990)
97	Campanulaceae	Codonopsis reflexa D.Y. Hong, Plant Divers. Resours. 36 (3): 289, fig.3 (2014).
98	Campanulaceae	Cyananthus hayanus Marq., New fl. & Silv. 8: 207 (1936).
99	Campanulaceae	Cyananthus himalaicus K. K. Shrestha, Brittonia 44: 253(1992).
100	Caryophyllaceae	Arenaria mukerjeeana (Majumdar) H. Hara, J. Jap. Bot. 51: 7 (1976).
101	Caryophyllaceae	Arenaria paramelanandra H. Hara, J. Jap. Bot. 52 (7): 193 (1977).
102	Caryophyllaceae	Silene davidlongii Rajbh. & Mitsuo Suzuki, J. jap. Bot. 82 (5): 276 (2007).
103	Caryophyllaceae	Silene fissicalyx Bocquet & Chater in Hara & Williams, Enum. Fl. Pl. Nepal 2: 55 (1979).
104	Caryophyllaceae	Silene greywilsonii Rajbh, & Mitsuo Suzuki, J. Bot. 82 (5): 278 (2007).
105	Caryophyllaceae	Silene helleboriflora Exell & Bocquet, Candollea 17: 37 (1959).
106	Caryophyllaceae	Silene hideakiohbae Rajbh. & Mitsuo Suzuki, J. Jap. Bot. 82(5): 275 (2007).
107	Caryophyllaceae	Silene stellariifolia Bocquet & Chater in Hara & Williams, Enum. Fl. Pl. Nepal 2: 56 (1979).
108	Caryophyllaceae	Silene vautierae Bocquet, Candollea 22: 17 (1967).
109	Crassulaceae	Rhodiola nepalica (H. Ohba) H. Ohba, J. Jap. Bot. 51: 386 (1976).
110	Crassulaceae	Rosularia marnieri (R-Hamet ex H. Ohba) H. Ohba, J. Jap. Bot. 52:7 (1977).
111	Crassulaceae	Sedum pseudo-multicaule H. Ohba, J. Jap. Bot. 53: 328 (1978).
112	Cucurbitaceae	Gomphogyne nepalensis W. J. de Wilde 7 duyfjes, For Bull. (Bot.) 35: 60 (2007).
113	Cyperaceae	Carex esbirajbhandarii (Rajbh. & H. Ohba) O. yano, J. Linn. Soc. 179: 21 (2015).
114	Cyperaceae	Carex gandakiensis Katsuyama in Ohba *et al.,*Fl. Mustang, Nepal: 444 (2008).
115	Cyperaceae	Carex himalaica T. Koyama, Bot. Mag. (Tokyo) 86: 278 (1973).
116	Cyperaceae	Carex mallae (Rajbh. & H. Ohba) O. Yano, j. Linn. Soc. 179: 23 (2015).
117	Cyperaceae	Carex rhombifructa Ohwi, J. Jap. Bot. 44: 60 (1966)
118	Cyperaceae	Carex rufulistolon T. Koyama, Acta Phytotax. Geobot. 15 (4): 111 (1954).
119	Elaeagnaceae	Elaeagnus tricholepsis Momiy., J. Jap. Bot. 48: 262 (1973).
120	Ericaceae	Rhododendron cowanianum Davidian, Notes Roy. Bot. Gard. Edinb. 21: 99 (1952).
121	Ericaceae	Rhododendron lowndesii Davidian, Notes Roy. Bot. Gard. Edinb. 21: 99 (1952).
122	Eriocaulaceae	Eriocaulon exsertum Satake in Hara, FL. E. Himal. 2: 156 (1971).
123	Eriocaulaceae	Eriocaulon kathmanduense Satake in Hara, FL. E. Himal. 2: 157, f. 10 (1971).
124	Eriocaulaceae	Eriocaulon obclavatum Satake in Hara, FL. E. Himal. 2: 158 (1971)
125	Eriocaulaceae	Eriocaulon trisectoides Satake in Hara, Fl. E. Himal. 2: 159 (1971).
126	Euphorbiaceae	Croton nepalensis T. Kuros., Edinb. J. Bot. 61 (1): 34 (2004).
127	Euphorbiaceae	Mallotus bicarpellatus T. Kuros., Edinb. J. Bot. 61 (1): 31 (2004).

128	Fabaceae	Astragalus barclayanus Podlech, Novon 14: 217 (2004).
129	Fabaceae	Astragalus chateri Vassilez., Nov. Syst. Pl. Vasc. 16: 140 (1979).
130	Fabaceae	Astragalus jumlaensis Podlech, Feddes Repert. 117 (3-4): 227 (2006).
131	Fabaceae	Astragalus lobbichleri Podlech, Feddes Repert. 120 (1&2): 50 (2009).
132	Fabaceae	Astragalus nakaoi Kitam. In Kihara, Peoples Nep. Him. : 422 (1957).
133	Fabaceae	Astragalus nepalensis Podlech, Sendtnera 6: 137 (1999).
134	Fabaceae	Astragalus notabilis Podlech, Feddes Repert. 117(3-4): 230 (2006).
135	Fabaceae	Astragalus poluninii Podlech, Sendtnera 7: 178 (2001).
136	Fabaceae	Astragalus pseudorigidulus Podlech, Feddes Reprert. 120(1&2): 55 (2009).
137	Fabaceae	Colutea multiflora Shap. ex Ali, Bot. Not. 112, 4: 491 (1959)
138	Fabaceae	Crotalaria kanaii H. Ohashi, J. Jap. Bot. 51: 301 (1976).
139	Fabaceae	hedysarum manaslense (Kitam.) H. Ohashi, J. jap. Bot. 50 (10): 23 1975).
140	Fabaceae	Millettia nepalensis R. N. Parker, Kew Bull. 1931: 42 (1931).
141	Fabaceae	Oxytropis arenae-ripariae Vass., Nov. Syst. Pl Vasc. 14: 170 (1977).
142	Fabaceae	Oxytropis fasciculiflorum Vass., Nov. Syst. Pl. Vasc. 14: 176 (1977).
143	Fabaceae	Oxytropis graminetorum Vass., Nov. Syst. Pl. Vasc. 14: 174 (1977).
144	Fabaceae	Oxytropis morenarum Vass., Nov. Syst. Pl. Vasc. 14: 172 (1977).
145	Fabaceae	Oxytropis nepalensis Vass., Nov. Syst. Pl. Vasc. 14: 175 (1977).
146	Fabaceae	Oxytropis torrentium Vass., Nov. Syst. Pl. Vasc. 14: 174 (1977).
147	Fabaceae	Oxytropis williamsii Vass., Nov. Syst. Pl. Vasc. 14: 168 (1977).
148	Fabaceae	Rhynchosia nepalensis H. Ohashi & Tateishi, Bot. Mag. (Tokyo) 90: 228 (1977).
149	Gentianaceae	Gentiana chateri T. N. Ho, Bull. Nat. Hist. Mus. Lond. (Bot.) 23: 55 (1993).
150	Gentianaceae	Gentiana pentasticta C. Marq., J. Roy. Hort. Soc., London 57: 211 (1932)
151	Gentianaceae	Gentiana radicans H. Sm., Notes Roy. Bot. Gard. Edinb. 2: 250 (1965)
152	Gentianaceae	Gentiana sagarmathae Miyam. & H. Ohba, J. Jap. Bot. 71: 45 (1996)
153	Gentianaceae	Gentiana tetramerus Miyam. In Ohba et al., Fl. Mustang, Nepal: 221 (2008).
154	Gentianaceae	Gentianella glanduligera Airy Shaw in Hooker, Ic. Pl. 35: t. 3431 (1943).
155	Gentianaceae	Gentianella lowndesii H. Sm., J. Jap. Bot. 56: 276 (1981).
156	Gentianaceae	Swertia acaulis H. Sm., Bull. Brit. Mus. (Nat. Hist.), Bot. 4: 242 (1970).
157	Gentianaceae	Swertia barunensis P. Chassot, Bot. J. Linn. Soc. 141: 389 (2003).
158	Gentianaceae	Swertia nepalensis J. Shah, Pak. J. For. 38 (2): 79 (1988).
159	Hypericaceae	Hypericum cordifolium Choisy
160	Iridaceae	Iris staintonii H. Hara
161	Juncaceae	Juncus mustangensis Miyamoto &H.Ohba
162	Lamiaceae	Clinopodium nepalense (Kitam. &Murata) Braeuchler &Heubl
163	Lamiaceae	Discretitheca nepalensis (Moldenke) P. D. Cantino
164	Lamiaceae	Eriophyton nepalense (Hedge) Ryding, O.
165	Lamiaceae	Eriophyton staintonii (Hedge) Ryding, O.
166	Lamiaceae	Isodon dhankutanus Murata
167	Lamiaceae	Isodon namikawanus Murata
168	Lamiaceae	Isodon phulchokiensis H. W. Li
169	Lamiaceae	Microtoena nepalensis Stearn
170	Lamiaceae	Nepeta staintonii Hedge
171	Lamiaceae	Salvia transhimalaica Yonek.
172	Lauraceae	Machilus pubescens Blume
173	Lythraceae	Rotala rubra (Buch.-Ham. ex D. Don) H. Hara

174	Oleaceae	Jasminum amabile H. Hara
175	Ongraceae	Epilobium brevisquamatum Raven
176	Ongraceae	Epilobium staintonii Raven
177	Orchidaceae	Bulbophyllum nepalense Raskoti & Ale
178	Orchidaceae	Bulbophyllum raskotii J. J. Verm.,Schuit. & Vogel
179	Orchidaceae	Eria annapurnensis L.R.Shakya & M.R.Shrestha
180	Orchidaceae	Eria baniaii Bajracharya, Shakya & Chhetri
181	Orchidaceae	Eria nepalensis D.M.Bajracharya & K.K. Shrestha
182	Orchidaceae	Eria pokharensis D.M.Bajracharya, A. Subedi & K.K. Shrestha
183	Orchidaceae	Gastrochilus nepalensis B. B. Raskoti
184	Orchidaceae	Herminium fimbriatum (Raskoti) X.H.Jin, Schuit, Raskoti &L.Q. Huang
185	Orchidaceae	Herminium hongdeyuanii B. B. Raskoti
186	Orchidaceae	Liparis langtangensis B.B. Raskoti & Ale
187	Orchidaceae	Malaxis dolpensis M.R. Shrestha ,L.R. Shakya & S.K.Ghimire
188	Orchidaceae	Malaxis tamurensis Tuyama
189	Orchidaceae	Neottia chandrae B.B.Raskoti,J.J.Wood&R.Ale
190	Orchidaceae	Neottia nepalensis (N.P.Balakr.) Szlach.
191	Orchidaceae	Odontochilus nandae Raskoti & H.Kurzweil
192	Orchidaceae	Oreorchis porphyranthes Tuyama
193	Orchidaceae	Pleione coronaria P.J.Ceibb & C.Z.Tang
194	Orobanchaceae	Euphrasia nepalensis Pugsley
195	Orobanchaceae	Pedicularis annapurnensis T. Yamaz.
196	Orobanchaceae	Pedicularis anserantha T. Yamaz.,
197	Orobanchaceae	Pedicularis breviscaposa T. Yamaz.
198	Orobanchaceae	Pedicularis chamissonoides T. Yamaz.
199	Orobanchaceae	Pedicularis cornigera T. Yamaz.
200	Orobanchaceae	Pedicularis muguensis T. Yamaz.
201	Orobanchaceae	Pedicularis odontoloma T. Yamaz.
202	Orobanchaceae	Pedicularis oxyrhyncha T. Yamaz
203	Orobanchaceae	Pedicularis pseudoregeliana Tsoong
204	Orobanchaceae	Pedicularis tamurensis T. Yamaz.
205	Orobanchaceae	Pedicularis terrenoflora T. Yamaz.
206	Orobanchaceae	Pedicularis yalungensis T. Yamaz.
207	Orobanchaceae	Pedicularis yamazakiana R. R. Mill
208	Papaveraceae	Corydalis calycina Liden
209	Papaveraceae	Corydalis clavibracteata Ludlow
210	Papaveraceae	Corydalis megacalyx Ludlow
211	Papaveraceae	Corydalis simplex Liden
212	Papaveraceae	Corydalis spicata Liden
213	Papaveraceae	Corydalis stipulata Liden
214	Papaveraceae	Corydalis terracina Liden
215	Papaveraceae	Corydalis uncinata Liden
216	Papaveraceae	Corydalis uncinatella Liden
217	Papaveraceae	Meconopsis autumnalis P. A. Egan
218	Papaveraceae	Meconopsis chankeliensis Grey-Wilson
219	Papaveraceae	Meconopsis ganeshensis Grey-Wilson

220	Papaveraceae	Meconopsis gracilipes G. Tayl.
221	Papaveraceae	Meconopsis lamjungensis T. Yoshida, H. Sun & Grey-Wilson
222	Papaveraceae	Meconopsis manasluensis P. A. Egan
223	Papaveraceae	Meconopsis napaulensis DC.
224	Papaveraceae	Meconopsis regia G. Tayl.
225	Papaveraceae	Meconopsis simikotensis Grey-Wilson
226	Papaveraceae	Meconopsis staintonii Grey-Wilson
227	Papaveraceae	Meconopsis taylorii L.H.J. Williams
228	Plantaginaceae	Lagotis nepalensis T. Yamaz.
229	Plantaginaceae	Veronica emodi T. Yamaz.
230	Poaceae	Borinda emeryi Stapleton
231	Poaceae	Elymus nepalensis (Melderis) Melderis
232	Poaceae	Eulaliopsis sykesii Bor
233	Poaceae	Festuca eriobasis H. Scholz
234	Poaceae	Festuca nepalica E.B. Alexeev
235	Poaceae	Festuca poluninii E.B. Alexeev
236	Poaceae	Himalayacalamus asper Stapleton
237	Poaceae	Himalayacalamus cupreus Stapleton
238	Poaceae	Himalayacalamus fimbriatus Stapleton
239	Poaceae	Himalayacalamus planatus Stapleton
240	Poaceae	Himalayacalamus porcatus Stapleton
241	Poaceae	Poa hideaki-ohbae Rajbh.
242	Poaceae	Poa muktinathensis Rajbh.
243	Poaceae	Saccharum williamsii (Bor) Bor
244	Poaceae	Stipelula staintonii (Bor) Roeser & Hamasha
245	Poaceae	Thamnocalamus chigar (Stapleton) Stapleton
246	Polygonaceae	Bistorta confusa (Meisn.) Greene
247	Polygonaceae	Bistorta diopetesH. Ohba & S. Akiyama
248	Polygonaceae	Bistorta milletioides H. Ohba & S. Akiyama
249	Polygonaceae	Fagopyrum megacarpum H. Hara
250	Polygonaceae	Fallopia filipes (H. Hara) Holub
251	Primulaceae	Primula didyma W. W. Sm.
252	Primulaceae	Primula poluninii Fletcher
253	Primulaceae	Primula ramzanae Fletcher
254	Primulaceae	Primula sharmae Fletcher
255	Primulaceae	Primula wigramiana W. W. Sm.
256	Ranunculaceae	Aconitum amplexicaule Lauener
257	Ranunculaceae	Aconitum angulatum Tamura
258	Ranunculaceae	Aconitum bhedingense Lauener
259	Ranunculaceae	Aconitum dhwojii Lauener
260	Ranunculaceae	Aconitum poluninii Lauener
261	Ranunculaceae	Aconitum staintonii Lauener
262	Ranunculaceae	Aconitum tabatae Tamura
263	Ranunculaceae	Aconitum williamsii Lauener
264	Ranunculaceae	Anemone fuscopurpurea H. Hara
265	Ranunculaceae	Clematis bracteolata Tamura

266	Ranunculaceae	Clematis phlebantha L. H. J. Williams
267	Ranunculaceae	Delphinium himalayai Munz
268	Ranunculaceae	Delphinium unifolium Tamura
269	Ranunculaceae	Delphinium williamsii Munz
270	Ranunculaceae	Oxygraphis nepalensis Tamura
271	Ranunculaceae	Ranunculus himalaicus Tamura
272	Ranunculaceae	Ranunculus makaluensis Kadota
273	Rosaceae	Potentilla makaluensis H. Ikeda & H. Ohba
274	Rosaceae	Potentilla turfosoides H. Ikeda & H. Ohba
275	Rosaceae	Prunus himalaica Kitam.
276	Rosaceae	Prunus jajarkotensis H. Hara
277	Rosaceae	Prunus taplejungnica H. Ohba & S. Akiyama
278	Rosaceae	Prunus topkegolensis H. Ohba & S. Akiyama
279	Rosaceae	Sibbaldia emodi H. Ikeda & H. Ohba
280	Rosaceae	Sorbus sharmae M. F. Watson, V. Manandhar & Rushforth
281	Rubiaceae	Galium nepalense Schoenb.-Tem. & Ehrendorfer
282	Rubiaceae	Galium saipalense Schoenb.-Tem. & Ehrendorfer
283	Rubiaceae	Ophiorrhiza nepalensis Deb & Mondal
284	Salicaceae	Salix nepalensis Yonek.
285	Salicaceae	Salix plectilis Kimura
286	Salicaceae	Salix staintoniana Skvortsov
287	Saxifragaceae	Saxifraga alpigena H. Sm.
288	Saxifragaceae	Saxifraga amabilis H. Ohba & Wakabaya.
289	Saxifragaceae	Saxifraga cinerea H. Sm.
290	Saxifragaceae	Saxifraga excellens H. Sm.
291	Saxifragaceae	Saxifraga ganeshii H. Ohba & S. Akiyama
292	Saxifragaceae	Saxifraga harae H. Ohba & Wakabaya.
293	Saxifragaceae	Saxifraga hypostoma H. Sm.
294	Saxifragaceae	Saxifraga jaljalensis H. Ohba & S. Akiyama
295	Saxifragaceae	Saxifraga lowndesii H. Sm.
296	Saxifragaceae	Saxifraga mallae H. Ohba & Wakabaya.
297	Saxifragaceae	Saxifraga micans H. Sm.
298	Saxifragaceae	Saxifraga mira H. Sm., Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 114 (1958).
299	Saxifragaceae	Saxifraga namdoensis H. Sm., Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 237 (1960).
300	Saxifragaceae	Saxifraga neopropagulifera H. Hara, J. Jap. Bot. 51 (1): 7 (1976).
301	Saxifragaceae	Saxifraga poluninana H. Sm.,Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 114 (1958).
302	Saxifragaceae	Saxifraga rhodopetala H. Sm.Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 124 (1958).
303	Saxifragaceae	Saxifraga rolwalingensis H. Ohba, J. Jap. Bot. 59: 360 (1984).
304	Saxifragaceae	Saxifraga roylei H. Sm., Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 95 (1958).
305	Saxifragaceae	Saxifraga staintonii H. Sm. Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 118 (1958).
306	Saxifragaceae	Saxifraga williamsii H. Sm., Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 100 (1958).
307	Saxifragaceae	Saxifraga zimmermannii Baehni Baehni, Candollea 16: 226 (1958).
308	Scrophulariaceae	Scrophularia bheriensis T. Yamaz., J. Jap. Bot. 46: 247 (1971).
309	Scrophulariaceae	Scrophularia laportiifolia T. Yamaz., J. Jap. Bot. 46: 248, f. 4, 2-3, t. 12, 6 (1971).
310	Urticaceae	Pilea kanaii H. Hara, J. Jap. Bot. 49: 193 (1974).
311	Zingiberaceae	Roscoea ganeshensis Cowley & W.J.Baker, Curtis's Bot. Mag. 13: 10 (1996).

312	Zingiberaceae	Roscoea nepalensis Cowley, Kew Bull. 34: 811 (1980).
313	Zingiberaceae	Roscoea tumjensis Cowley, Kew Bull. 36: 755 (1982).

Appendix 3a. Publication of news related to the project and inception workshop in a newsletter of the Department of Plant Resources (November 2018)

जैविक विविधता तथा साइटिस शाखा

Mobilizing occurrence data of alien and endemic plant species of Nepal

वनस्पतिशास्त्र केन्द्रीय विभाग, त्रिभुवन विश्वविद्यालय र वनस्पति विभागको सहकार्य एवं Royal Botanic Garden Edinburgh, UK (RBGE), को सहभागितामा Tribhuvan University Central Herbarium (TUCH) र National Herbarium and Plant Laboratories (KATH) मा संग्रहित नेपालका बाह्य मिचाहा (Invasive alien) तथा रैथाने वनस्पति (endemic plant) का मृत वनस्पति नमूना (herbarium) हरूको डिजिटाइजेसन (digitization) गरी database तयार गर्ने कार्यका लागि Global Biodiversity Information Facility (GBIF) को Biodiversity Information Fund for Asia (BIFA) कार्यक्रम अन्तर्गत मार्फत यूरो

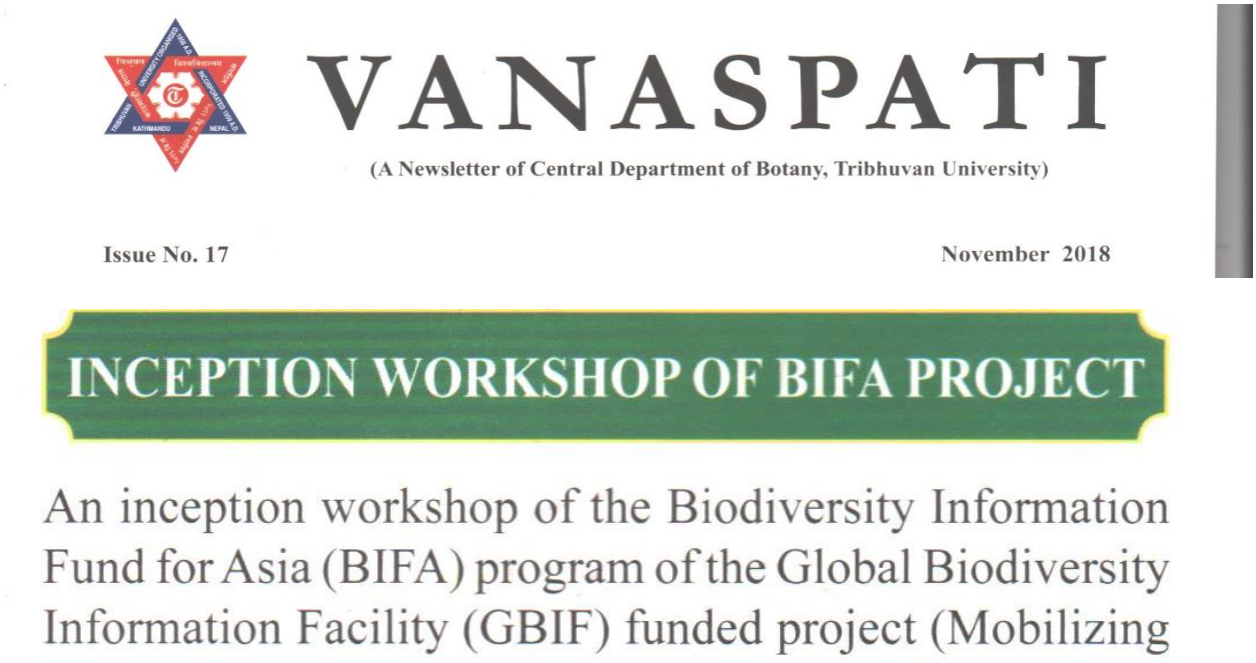
१४,००८ बराबरको प्राप्त आर्थिक सहयोग CDB, TU मार्फत सञ्चालन हुनेछ। यो परियोजना May 2018 देखि March 2019 सम्म सञ्चालन हुनेछ र परियोजना सञ्चालनका लागि निम्न बमोजिमको विज्ञ टोली रहेको छः

क्र.सं.	नाम, थर	पद, संस्था	कैफियत
1.	Prof. Mohan Siwakoti	Head of CDB,T.U.	Principal investigator
2.	Mr. Sanjeev Kumar Rai	Director General, DPR	Co-Principal investigator
3.	Dr. Bharat Babu Shrestha	Associate Professor, CDB, TU	Project Coordinator
4.	Dr. Suresh Kumar Ghimire	Associate Professor, CDB, TU	Plant taxonomist
5.	Ms. Kalpana Sharma (Dhakal)	Scientific Officer, DPR	Expert
6.	Mr. Tirtha Raj Pandey	Research Officer, KATH	Expert
7.	Dr. Mark Watson	RBGE	Expert
8.	Dr. Bhaskar Adhikari	RBGE	Expert
9.	Mr. Yagya Raj Paneru and	-	Research Assistant
10.	Mr. Ganesh Dutt Joshi	-	Research Assistant

यस परियोजनाको अवधारणागत गोष्ठी (Inception workshop) प्रा.डा. मोहन सिवाकोटीको अध्यक्षतामा 6th July 2018 मा थापाथलीस्थित वनस्पति विभागमा सञ्चालन भएको थियो। उक्त Workshop मा वन तथा वातावरण मन्त्रालय, कृषि तथा पशु पंक्षी विकास मन्त्रालय, वन तथा वातावरण मन्त्रालय अन्तर्गतका विभागहरू, त्रिभुवन विश्वविद्यालय

अन्तर्गतका वनस्पतिशास्त्र, प्राणीशास्त्र, वातावरण केन्द्रीय विभाग, प्राकृतिक विज्ञान संग्रहालय, नेपाल विज्ञान तथा प्रविधि प्रतिष्ठान (NAST), IUCN Nepal, ICIMOD, Biodiversity International, Forest Action का गरी जम्मा ५३ जनाको उपस्थिति रहेको र विज्ञहरूका चार वटा कार्यपत्र प्रस्तुतिकरण भएको थियो।

Appendix 3b. Publication of news related to the project and inception workshop in a newsletter of the Central Department of Botany, Tribhuvan University (November 2018)



VANASPATI

(A Newsletter of Central Department of Botany, Tribhuvan University)

Issue No. 17 November 2018

INCEPTION WORKSHOP OF BIFA PROJECT

An inception workshop of the Biodiversity Information Fund for Asia (BIFA) program of the Global Biodiversity Information Facility (GBIF) funded project (Mobilizing

occurrence data of alien and endemic plant species of Nepal) project was organized on July 6, 2018 at the Department of Plant Resources, Thapathali, Kathmandu. The project is being implemented jointly by the Central Department of Botany (TU) and the Department of Plant Resources (Ministry of Forest and Environment) in collaboration with the Royal Botanic Garden Edinburgh, UK.

The inaugural session was chaired by Prof. Mohan Siwakoti and the technical session by Prof. Mohan Prasad Panthi. There were four technical papers presented during the workshop by Dr. Bharat Babu Shrestha (CDB, TU), Mr. Tirtha Raj Pandey (KATH, Godawari), Dr. Suresh Kumar Ghimire (CDB, TU) and Dr. Nakul Chettri (ICIMOD). Prof. Ram N Jha (Assistant Dean, IOST, TU), Dr. Deepak Kharal (Director General, Department of Forest Research and Survey), Mr. Sanjeev K Rai (Director General, Department of Plant Resources), and other participants expressed their opinion during the workshop.

The workshop was participated by 53 participants from Ministry of Forest and Environment, Ministry of Agriculture, Department of Forest Research and Survey, Department of National Park and Wildlife Reserve, Department of Forests, Central Departments of Tribhuvan University Botany, Zoology, Environment, Natural History Museum of Tribhuvan University, Nepal Academy of Science and Technology, National Gene Bank, IUCN Nepal, ICIMOD, Biodiversity International, Forest Action, etc.

AWARENESS PROGRAM

Mikania removal program

About 25 students of M.Sc. botany participated Mikania removal program organized on Biodiversity day (Dec. 29, 2017) at Baireni, Dhading. The main objective of the program was to make communities aware of the future consequences of the spread of noxious invasive weed like *Mikania micrantha* (mile-a-minute). Dr. B. B. Shrestha led the students and they interacted with official of the forest range post, local people and secondary level students.

DEPARTMENTAL COMMITTEES

To fulfil the need of the department and improve its quality following committees were formed:

INTERNAL QUALITY ASSURANCE COMMITTEE

Prof. Dr. Mohan Siwakoti
Prof. Dr. Mohan Panthi
Prof. Dr. Sangeeta Rajbhandary
Prof. Dr. Ram Kailash Prasad Yadav
Prof. Dr. Bijaya Pant
Dr. Suresh Kumar Ghimire

Signed on behalf of the project partners	Date
	15 August 2019
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(Prof. Mohan Siwakoti)	