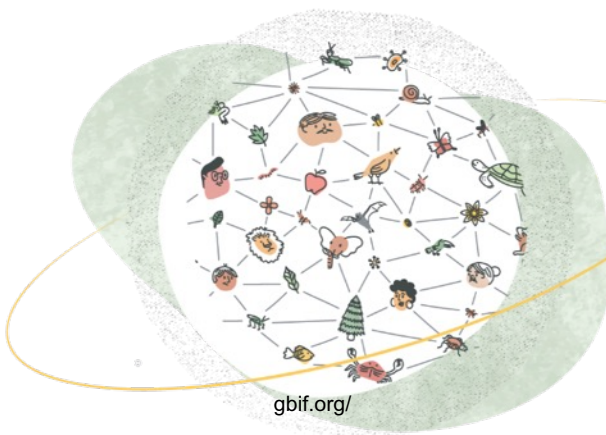


# GBIF Data Use for Policies: Bringing GBIF/BIFA Experience on the IPBES Assessment on Sustainable Use of Wild Species (2018 – 2022)



**Shiva Devkota, PhD**

**Global Institute for Interdisciplinary Studies (GIIS), Kathmandu, Nepal**

**Selected Fellow: IPBES –Sustainable Use Assessment**

**Grantee: GBIF-BIFA5\_023 (2020)**

**[shiva.devkota@gmail.com](mailto:shiva.devkota@gmail.com)**

# Activities Related to the Digitization of Herbarium Specimens in Nepal



Government of Nepal  
Ministry of Forests and Environment  
**Department of Plant Resources**  
**National Herbarium and Plant Laboratories (KATH)**



Digitized over 135,000 herbarium specimens (Phanerogams and Cryptogams only)

Online species: 113,262 specimens  
at [plantdatabase.kath.gov.np](http://plantdatabase.kath.gov.np).



## A collaborative project (BIFA5\_023)

Ten scientists from Four institutes (Nepal Government, University, Museum, NGO) collaborated for this project



The screenshot shows a project page with a green navigation bar at the top. The bar contains a logo on the left, followed by links for 'Get data', 'How-to', 'Tools', 'Community', and 'About'. On the right side of the bar are icons for a heart, a language selector (set to 'A'), a search icon, a message icon, and a search box containing the text 'fungi'. Below the navigation bar, the text 'PROJECT | CLOSED' is centered. The main title 'Digitization of mycological collections in Nepal' is prominently displayed. Underneath the title, the dates '1 July 2020 - 31 July 2021' and the amount '€ 14,750' are shown. A secondary navigation bar below the title includes links for 'ABOUT', 'NEWS & EVENTS', and 'DATASETS'. On the far right of this bar is a dark button labeled '9 CITATIONS'. The bottom portion of the screenshot shows a close-up photograph of bright yellow, cup-shaped fungi growing on a dark, textured surface.



# Collaborators

1. National Herbarium (KATH)
2. Tribhuvan University (TUCH)
3. Natural History Museum, (NHM) TU



## Strength:

KATH: Plants (0.2 ml specimens)

TUCH: Plants (0.1 ml specimens)

NHM: Butterflies, Beetles, Mushrooms, Birds and flagship mammals.



### Mushrooms Flora of Nepal at National Herbarium and Plant Laboratories (KATH)

Occurrence dataset

This occurrence database contains records of the lichens based on the herbarium specimens deposited at the National Herbarium and Plant Laboratories (KATH), Godawari, Lalitpur, Nepal. Established in 1



Published by Department of Plant Resources, MoFE, Government of Nepal

1,620 occurrences 6 citations

### Mushrooms Flora of Nepal at Natural History Museum

Occurrence dataset

This occurrence database contains records of the mushrooms based on the herbarium specimens deposited at the Natural History Museum (NHM), Tribhuvan University Nepal. Situated on the lap of a world heri



Published by Natural History Museum, Tribhuvan University

1,644 occurrences 9 citations

### Lichens Flora of Nepal at National Herbarium and Plant Laboratories (KATH)

Occurrence dataset

This occurrence database contains records of the lichens based on the herbarium specimens deposited at the National Herbarium and Plant Laboratories (KATH), Godawari, Lalitpur, Nepal. Established in 1



Published by Department of Plant Resources, MoFE, Government of Nepal

1,207 occurrences 4 citations



### Lichens Flora of Nepal at Central Department of Botany, Tribhuvan University, Nepal

Occurrence dataset

This occurrence database contains records of the lichens based on the herbarium specimens deposited at the Tribhuvan University Central Herbarium (TUCH) managed by the Central Department of Botany, Tr



Published by Central Department of Botany, Tribhuvan University

1,123 occurrences 4 citations

### Mushrooms Flora of Nepal at Central Department of Botany, Tribhuvan University, Nepal

Occurrence dataset

This occurrence database contains records of the mushrooms based on the herbarium specimens deposited at the Tribhuvan University Central Herbarium (TUCH) managed by the Central Department of Botany,



Published by Central Department of Botany, Tribhuvan University

707 occurrences 8 citations

### Lichens Flora of Nepal at Natural History Museum, Tribhuvan University, Nepal

Occurrence dataset

This occurrence database contains records of the lichens based on the herbarium specimens deposited at the Natural History Museum (NHM), Tribhuvan University Nepal. Situated on the lap of a world heri



Published by Natural History Museum, Tribhuvan University

132 occurrences 4 citations

**Lichens:** 2,462 specimens  
**Mushrooms:** 3,971 specimens  
Occurrence records  
Published on the GBIF platform



# Species Occurrence Data of Nepal in GBIF ( 09.Nov. 2022)

SEARCH OCCURRENCES | 879,478 RESULTS

TABLE GALLERY MAP TAXONOMY METRICS ↓ DOWNLOAD

TAXONOMIC DISTRIBUTION OF OCCURRENCES

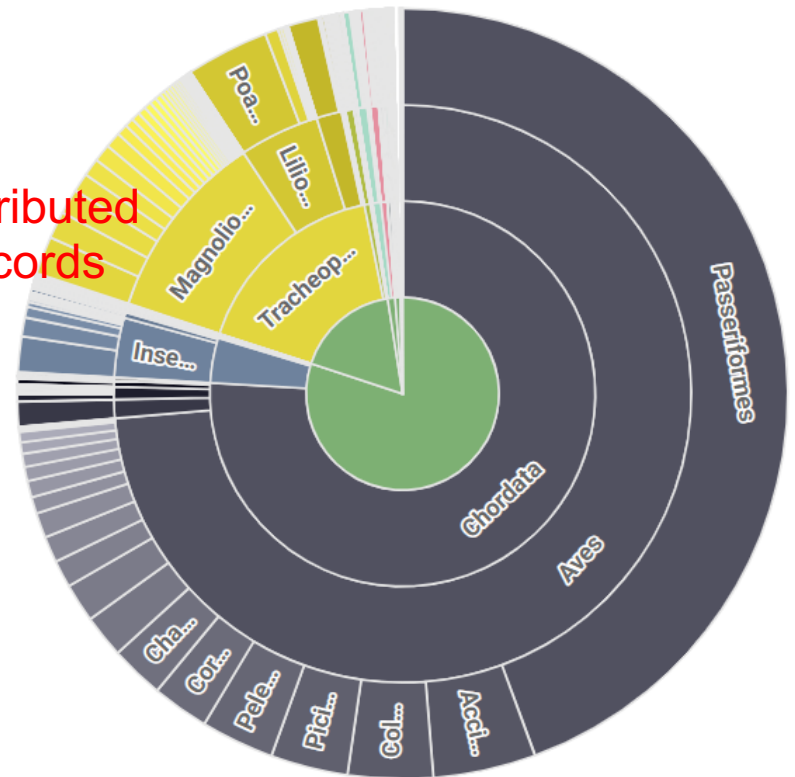
TAXONOMIC DISTRIBUTION OF OCCURRENCES



Explore Major groups

Animalia	704,225
Plantae	153,444
Fungi	10,967
Bacteria	7,408
incertae sedis	2,371
Viruses	642
Protozoa	218
Chromista	108
Archaea	95

BIFA5\_023 has contributed 6,433 occurrence records alone



# National Herbarium and Plant Laboratories (KATH) Herbarium Plant Database

<http://plantdatabase.kath.gov.np/plants/search>



**National Herbarium and Plant Laboratories (KATH)**  
Herbarium Plant Database

Home Search Plant Database

Search Herbarium Plant Database

Family \_\_\_\_\_

Genus \_\_\_\_\_

Species \_\_\_\_\_

Collector \_\_\_\_\_


Collection number \_\_\_\_\_

Barcode \_\_\_\_\_

Country \_\_\_\_\_

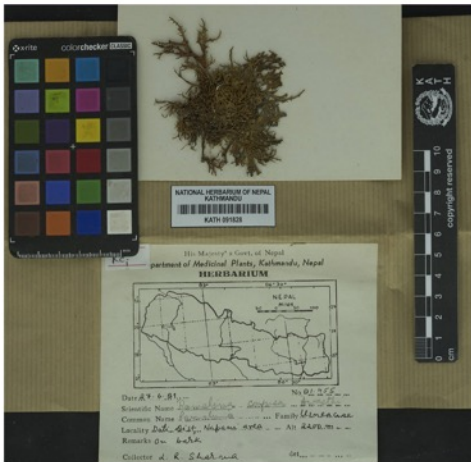
Search Plant Database

Copyright © 2019 - Plant Database System | Herbarium & Plant Laboratories (KATH)



**National Herbarium and Plant Laboratories (KATH)**  
Herbarium Plant Database

Home Search Plant Database



**Ramalina Confusa Awasthi**

Collection Information

Barcode:	KATH00820	Collection Number:	0455
Collectors Name:	Sharma, L. S.	Country:	Nepal
ISO Standard:	IP	Locality:	Dub District, Nageri area
Altitude Qualifier:	On bank	Altitude:	2000 m
Notes:	On bank	First Collection Date:	08-08-27
Second Collection Date:	0000-00-00	Collection Other Text:	

Plant Name Information

Label Name:	Ramalina Confusa Awasthi	Family Name:	Ramalinaceae
Local Name:		Genus:	Ramalina
Genus Qualifier:		Species:	confusa
Species Qualifier:		Author:	Awasthi
Infra Specific Rank:		Infra Specific Epithet:	
Infra Specific Author:		Type Status:	
First Identification Date:	0000-00-00	Identifier:	
Second Identification Date:	0000-00-00	Identification Other Text:	

# Contributions beyond Datasets Publications

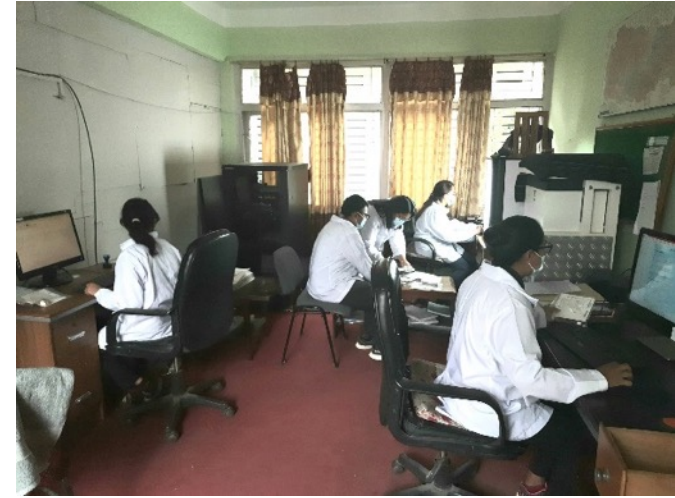
Two institutes registered as data publishers

Capacity building: Infrastructure & human resources

**What we found? and how our data is supporting for the research planning in Nepal?**

1. How well surveyed is Nepal's mycodiversity ?
2. Which areas are under-surveyed?
3. Are these records available for conservation assessment, policy lobbying and for the further expeditions planning?

Department of Plant Resources (DPR), Ministry of Forests and Environment (MOFE),  
- well aware about further exploration sites especially for lichens and mushrooms  
( We believe – this is a great success)





# Knowledge sharing # BIFA5\_023

## Mycological Digitization



### Wild Mushrooms in Nepal : Plate to Poison



Shiva Devkota, PhD  
Global Institute for Interdisciplinary Studies (GIIS), Kathmandu, Nepal  
[shiva.devkota@gmail.com](mailto:shiva.devkota@gmail.com)

GIIS Webinar Series No 13 : 24 Aug 2020



### Digitization of the Lichen Herbarium Collection: Lessons Learned and Methodological Insights from Nepal



Shiva Devkota, PhD  
Global Institute for Interdisciplinary Studies (GIIS)  
Kathmandu, Nepal  
[shiva.devkota@gmail.com](mailto:shiva.devkota@gmail.com)



### From Ignored to Wanted : Wild Mushrooms - Resource Status, Conservation and Utilization in Nepal



Shiva Devkota, PhD  
Global Institute for Interdisciplinary Studies (GIIS), Kathmandu, Nepal  
[shiva.devkota@gmail.com](mailto:shiva.devkota@gmail.com)

Talk Program: Dept of Botany, Mechi Multiple Campus : 28 August 2022

# In shadow of giant mountains, they explore vital world of mushrooms

Travel barriers have thwarted scientific study in the Everest region, which makes mycologist Shiva Devkota's work all the more important.

By Sarah Watson

September 18, 2022 at 7:19 a.m. EDT



## MOST REA



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## THE KATHMANDU POST

Sunday, July 10, 2022

Without Fear or Favour

WHAT'S NEWS: West Seti project Dengue outbreak 'Madheshi Manthan' Barriers for foreign contractors Deaths of

### MONEY

## Everest region is calm during monsoon. But mushrooms can be a new draw for trekkers

Tourism in Khumbu shuts down after the mountaineering season ends, but mycotourism may change that, experts say.



### MOST RE

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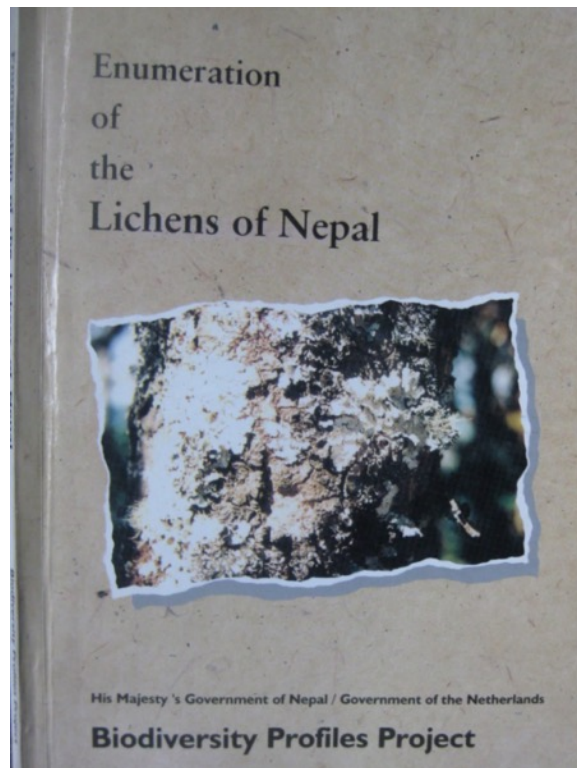
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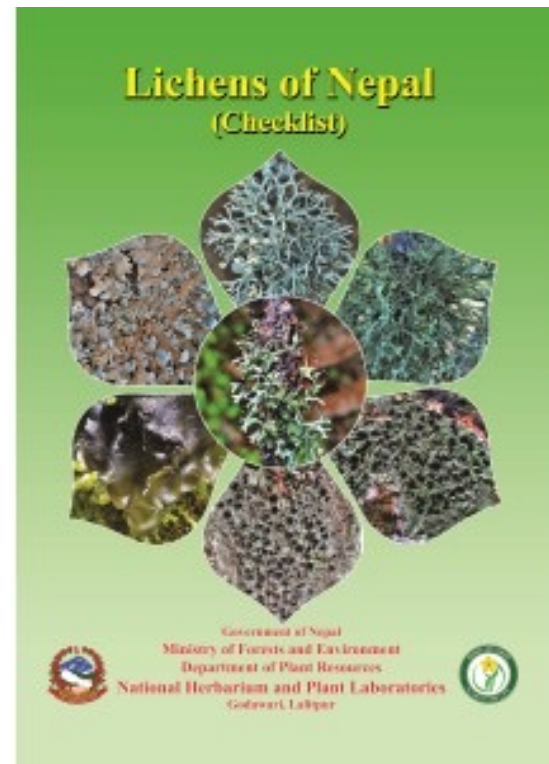
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**New updated checklist (Book) on Lichens of Nepal  
Published by Ministry of Forests and Environment, Nepal Government**



Year 1997  
(79 Genera, 495 Species)



Year 2022  
237 Genera, 1129 Species

**Global Sharing and Data Use ????**

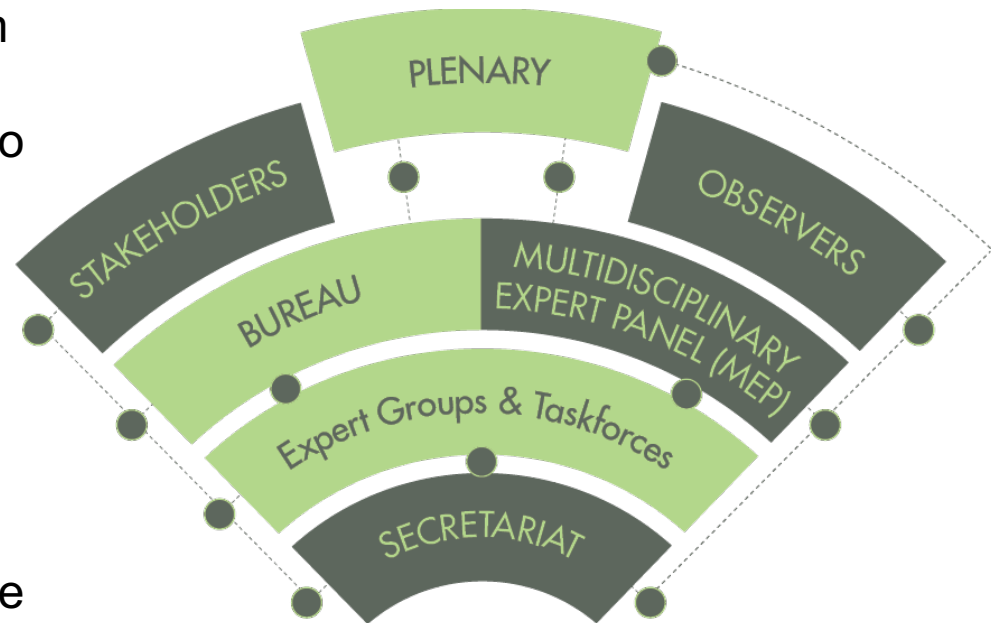
**IPBES ???**

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an “**independent intergovernmental body** that is open to all member countries of the United Nations.”

Established in Panama City, on 21 April 2012 by 94 Governments

United Nations Environment Programme (UNEP) provides secretariat services to IPBES

IPBES currently has close to 140 member States.



# The Sustainable Use Assessment

- Prepared in 4 years (2018-2022)
- More than 1000 pages, 6 chapters and a glossary, drawing on more than 6,200 sources.
- Many cases studies on sustainable use of wild species all over the world.
- 3 co-chairs and 85 authors (natural and social scientists) from 37 different countries, 200 contributing authors.
- Approved by IPBES member states in July 2022



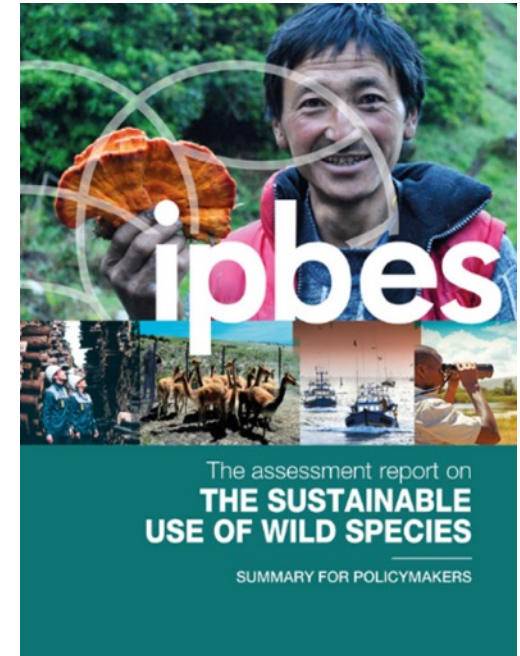
## Major Objectives of the Assessment

- Analyse status and trends in the sustainable use of wild species and drivers/causes of change
- Consider approaches that enhance the sustainable use of wild species
- Identify challenges and opportunities
- Strengthen practices, measures, capacities and tools

Recognizing the “inseparable unity of nature and humanity”

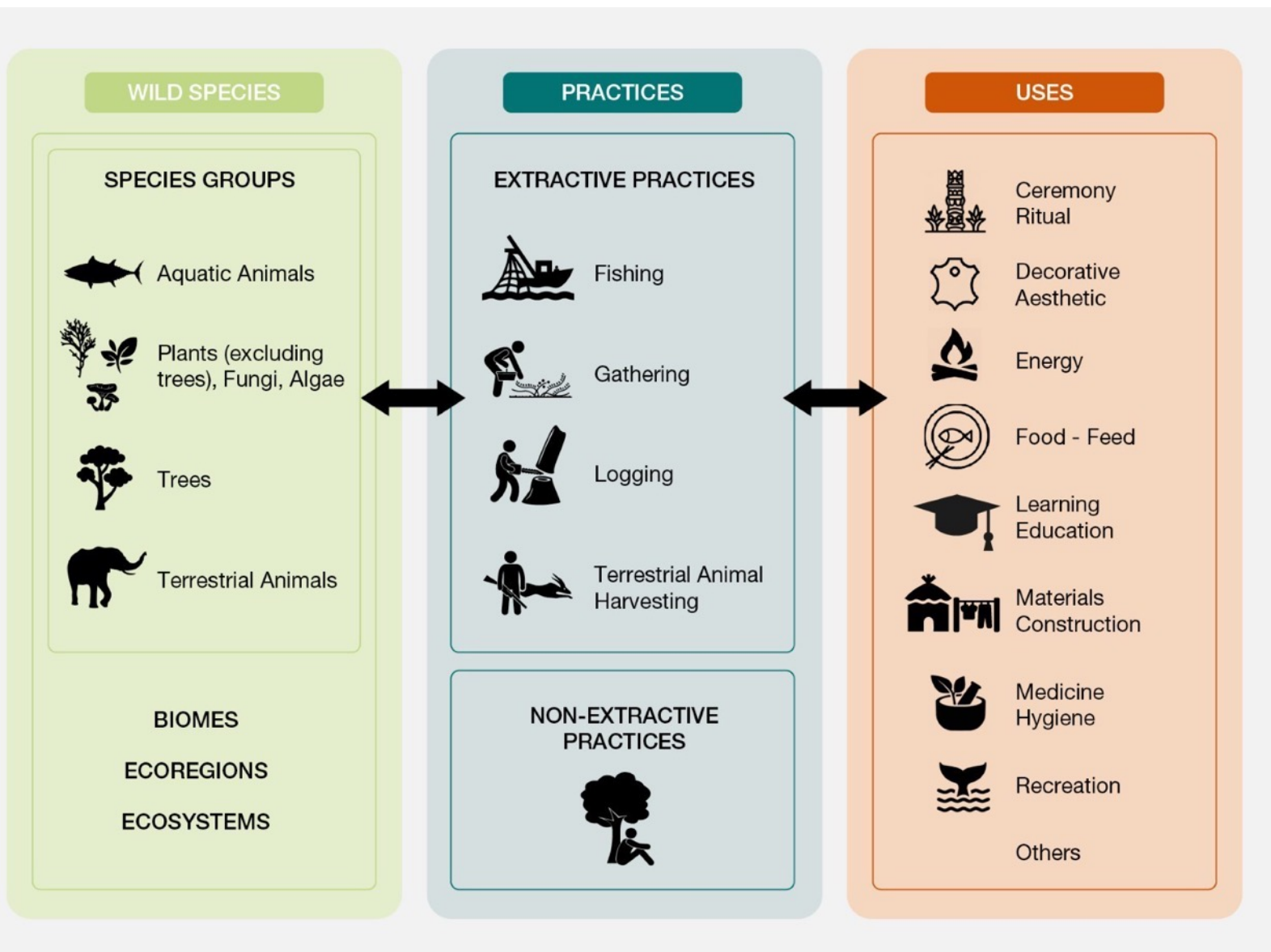
# The Assessment in a Nutshell

- Chapter 1 # Setting the scene
- Chapter 2 # Conceptualizing the sustainable use
- Chapter 3 # Status of and trends in the use
- Chapter 4 # The drivers of the sustainable use
- Chapter 5 # Future scenarios of sustainable use
- Chapter 6 # Policy options & responses



Includes diverse knowledge source: Peer-reviewed and grey literature, Indigenous local knowledge and **Databases (including GBIF)**.

# Diverse uses of Wild Species and Associated Practices



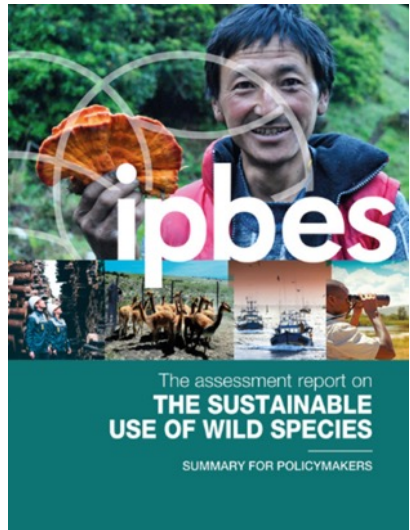


# Key findings, evidence and the policy options

- 50,000 Wild Species Meet Needs of Billions Worldwide
- Experts Offer Options to Ensure Sustainable Use
- 1 in 5 People Rely on Wild Species for Income & Food
- >10,000 Wild Species Harvested for Human Food
- 2.4 Billion People (1 in 3 people globally) Depend on Fuel Wood for Cooking.



# Fungi from Nepal on the cover page #SusUse 2022



*Laetiporus sulphureus* (Bull.) Murrill

Chicken of the woods mushroom

Photo by Shiva Devkota / Kangchenjunga (2800m), Eastern Part of Nepal



## GBIF mediated data has supported to describe Chapter 3 # Status and trends in the use

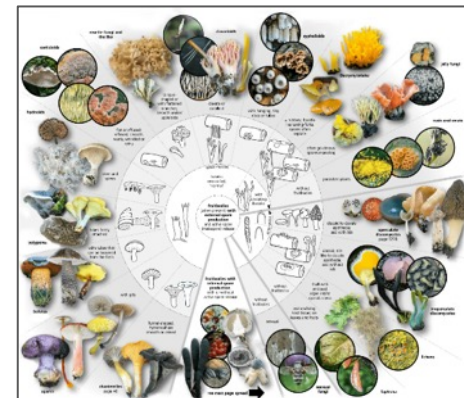
harvesting for scientific use. The Global Biodiversity Information Facility (GBIF) provides access to more than 1.4 billion records (including observations, preserved samples, fossils and living specimens) of all types of life on Earth in nearly 53,000 datasets supported by 1,600 institutions. The data of observation-based occurrences is surpassing the harvest of specimen-based occurrences in the Global Biodiversity Information Facility (Troudet, Vignes-Lebbe, Grandcolas, & Legendre, 2018). However, African countries, Central, South and Southeast Asian countries and East European countries have been poorly represented in harvest of vascular plants species aggregated in the Global Biodiversity Information Facility and data in the World Checklist of Vascular Plants are also poor (Antonelli et al., 2020; Paton et al., 2020).

In addition of the datasets available for the different practices there are also worldwide repositories such as the Global Biodiversity Information Facility (GBIF) that gather data for different taxa. The Global Biodiversity Information Facility platform (<https://www.gbif.org/>), which currently houses 1,4 billion records (accessed 15th June 2020), documents the occurrence of a species at a given time and place, however data on wild species use is not reported systematically.

The results of this review show that while there is a vast legacy of available data on

# Fungi and Sustainable Use Assessment

- Plants, fungi, algae and animals have been treated equally in every procedure of this assessment and highlighted broadly in the SPM (Summary for the Policymakers)
- Special sub-group was formed to work mainly on fungi # Chapter 3.
- Literature searches were conducted via a variety of search engines and databases to obtain status and trends of wild useful fungi.
- Among wild-harvested fungi, most commonly consumed and traded species are reported.



## Chapter 3 # Status of and trends in the use

- Information about the **uses** of wild plants, algae and fungi {3.2}
- Information about **trade** in wild plants, algae and fungi {3.3.2, 3.5}
- Studies of the **effects of harvest techniques** on wild plants, algae and fungi {3.3.2}
- Information about **urban gathering**, especially for Asia and the Pacific regions {3.3.2}
- Information on **formal and informal governance systems** {4.5}
- Impacts of use of wild plants, algae and fungi on **human health and food security** {3.3.1, 3.3.2, 3.3.5}
- **Projections and scenarios on gathering** of wild plants, algae and fungi {5.4.3}
- Projections and scenarios **of impacts of climate change on distributions** of wild plants, algae and fungi in use and the traditional territories of indigenous peoples and local communities that rely on them {5.4.3, 5.5}

## Knowledge gaps classified in 5 different categories

1. Data and information availability and access
2. Assessment methods, models and scenarios
3. Indigenous and local knowledge
4. Multiple uses and interactions of uses with other pressures
5. Practices

## Challenges in identifying knowledge gaps

1. Lack of consistency among worldwide databases, differing accounting methodologies
2. Challenge in accessing information in languages other than English and non-academic sources such as grey literature, government reports, and conference proceedings.

## Searching for the more practicality of the datasets..

The results of this review show that while there is a vast legacy of available data on species taxonomy and ecology for different taxa, **most datasets do not distinguish wild from domesticated species**, making this assessment very challenging.

Although there is available data on taxonomy and ecology for different taxa, particularly in germplasms/herbariums across the world, **lists of wild species available for some taxa are very incomplete.**

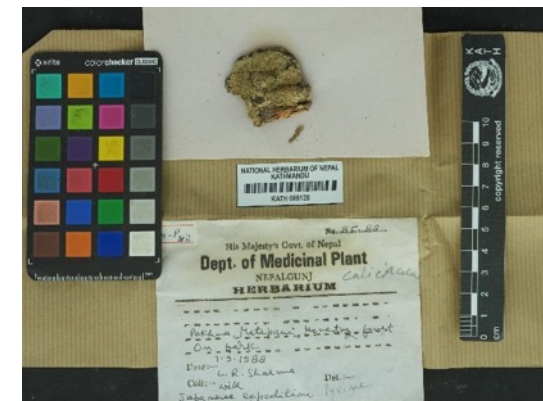
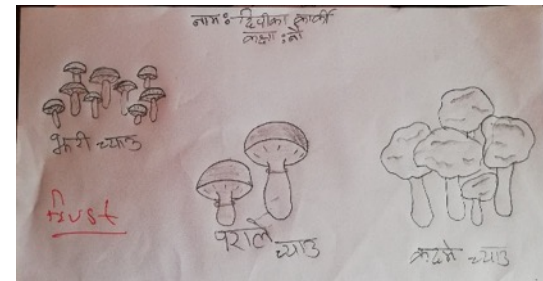
Even for the taxa where there are lists of wild species available, the focus is on biological conservation or economic value related to trade and markets **rather than specifically on use as defined here.**



The contribution of the data mobilized or learning from our BIFA project could be a **guiding example** to drive data-based insights and to encourage for the further collaboration and communication.

For the next, it is time to plan for the **“Citizen Science Approach”** and **“Society-IPLCs led Conservation Approach”** to enrich the GBIF platform with ground-level data (mainly with fungi).

People in vulnerable situations are often most reliant on wild species and are most likely to benefit from more sustainable forms of use of wild species to secure their livelihoods. **So, together with the higher plants, documentation and publications of such overlooked taxa like Wild Mushrooms and Lichens should be in priority.**





# Acknowledgements

- Team Members (BIFA5\_023)
- Collaborating Institutes
- IPBES Team
- Funding Agencies
- HKHBIF / ICIMOD  
(Dr. Bandana Shakya and Ms. Lily Shrestha)



## GBIF...

For this opportunity to present our work and my experience

...and thank you all for your gracious presence.

Further correspondences are always welcome  
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00977 9841-317-188  
(Nepal Mobile)

