



Case Studies of GBIF Data for SDGs and Open Science from Survey and Publication in Asia

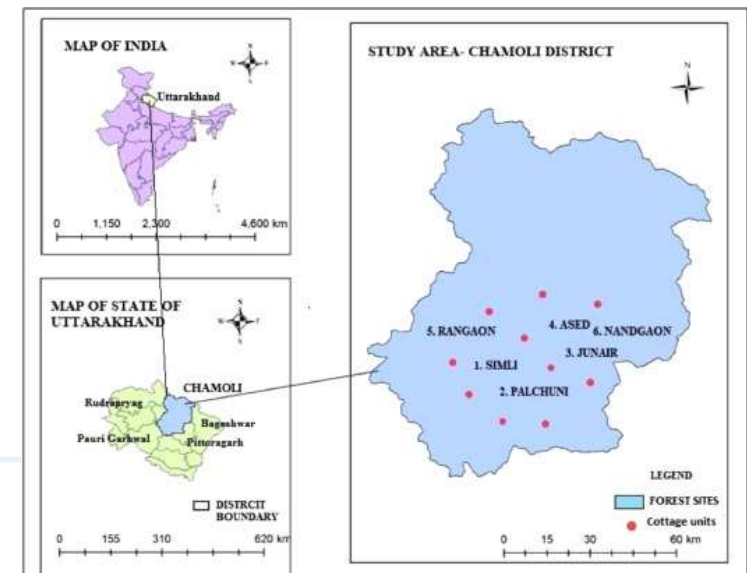


Value chain analysis of *Rhododendron arboreum* squash 'buransh' as a non-timber forest product (NTFP) in Western Himalayas: Case study of Chamoli district, Uttarakhand in India(2022)

1 NO POVERTY



- **Application:** *Rhododendron squash* provides high ecological and medicinal value as its extraction for commercial utilization provides many livelihood opportunities to the local communities of the Western Himalayas. The study explores the value-chain from the harvest of the *R. arboreum* for the *Rhododendron* squash preparation and its various components, stages, methods and, the opportunities and challenges involved with the case study of Chamoli District in the state of Uttarakhand.
- **GBIF Data:** *Rhododendron arboreum* Sm. in GBIF Backbone Taxonomy.
- **Country:** India
- **Open Science:** Open data
- **DOI:**10.1016/j.tfp.2022.100200

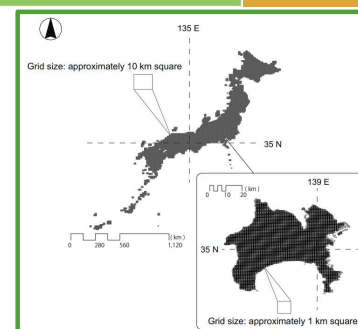


Trade-off relationship between modern agriculture and biodiversity: Heavy consolidation work has a long-term negative impact on plant species diversity (2016)

2 ZERO HUNGER



- Application:** This study examined the hypothesis that land consolidation decreases plant species diversity over the long term. To test this hypothesis, they examined the relationships between consolidated areas and the occurrence of threatened plant species across Japan and at the prefecture scale. Twenty-three threatened plant species were selected. Results suggest that threatened plant species require unconsolidated agricultural areas.
- GBIF Data:** Specimen records as distribution data for previously common but currently threatened species in Kanagawa Prefecture, Japan.
- Country:** Japan
- Open Science:** Open data
- DOI:** 10.1016/j.landusepol.2016.02.001



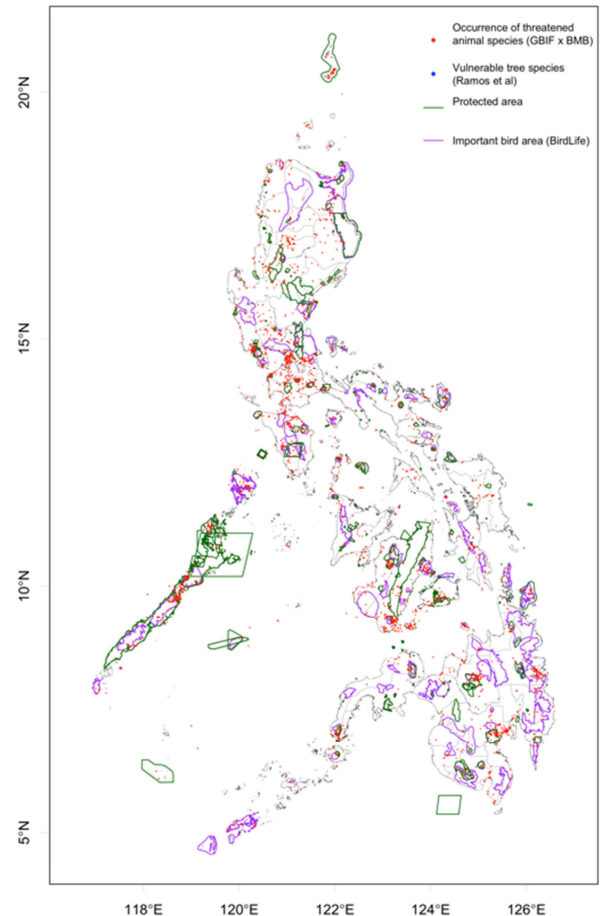
Family	Name
Azollaceae	<i>Azolla japonica</i>
Hydrocharitaceae	<i>Blyxa echinosperma</i>
Alismataceae	<i>Caldesia parnassifolia</i>
Compositae	<i>Gnaphalium hypoleucum</i>
Isoetaceae	<i>Isoetes japonica</i>
Compositae	<i>Ixeris chinensis</i> subsp. <i>strigosa</i>
Labiatae	<i>Leonurus macranthus</i>
Marsileaceae	<i>Marsilea quadrifolia</i>
Pontederiaceae	<i>Monochoria korsakowii</i>
Labiatae	<i>Mosla japonica</i>
Najadaceae	<i>Najas gracillima</i>
Menyanthaceae	<i>Nymphoides peltata</i>
Saxifragaceae	<i>Penthorum chinense</i>
Polygonaceae	<i>Persicaria foliosa</i> var. <i>paludicola</i>
Polygonaceae	<i>Persicaria taquetii</i>
Potamogetonaceae	<i>Potamogeton berchtoldii</i>
Salviniaceae	<i>Salvinia natans</i>
Compositae	<i>Saussurea pulchella</i>
Sparganiaceae	<i>Sparganium fallax</i>
Sparganiaceae	<i>Sparganium stenophyllum</i>
Trapaceae	<i>Trapa incisa</i>
Lentibulariaceae	<i>Utricularia uliginosa</i>
Asclepiadaceae	<i>Vincetoxicum pycnostelma</i>

Assessing the Impacts of Agriculture and Its Trade on Philippine Biodiversity (2020)

2 ZERO HUNGER



- **Application:** Philippine policies and data are investigated to better characterize the nexus between agriculture, biodiversity, and trade. An analysis of key national policies highlights that more stringent definitions and protections for biodiversity are needed to recognize the increasing roles that agricultural production, and importantly, its global trade, have on threatened Philippine species.
- **GBIF Data:** Species records from the Philippines were selected to obtain a species occurrence list for land fauna (mammals, birds, reptiles, and amphibians).
- **Country:** Philippines
- **Open Science:** Open data
- **DOI:** 10.3390/land9110403



Medicinal plants from the Himalayan region for potential novel antimicrobial and anti-inflammatory skin treatments (2022)

3 GOOD HEALTH AND WELL-BEING



- **Application:** The overarching aim of this project was selection of potential species for use in a future treatment by combining with plant resources with aspects of antimicrobial photodynamic therapy (aPDT). Specifically, we focussed on species used locally in the Himalayan region for the treatment of skin disorders and then assessed the existing pharmacological evidence for key species based on the published evidence available.

- **GBIF Data:** GBIF was used to estimate the altitude range of species occurrences, with two datasets – The Himalayan Uplands Plant database and Database of Vascular Plants of Himalaya.

- **Country:** Himalayan region (Bhutan, China, India, Nepal and Pakistan)

- **Open Science:** Open data, publication

- **DOI:** 10.1093/jpp/rgab039

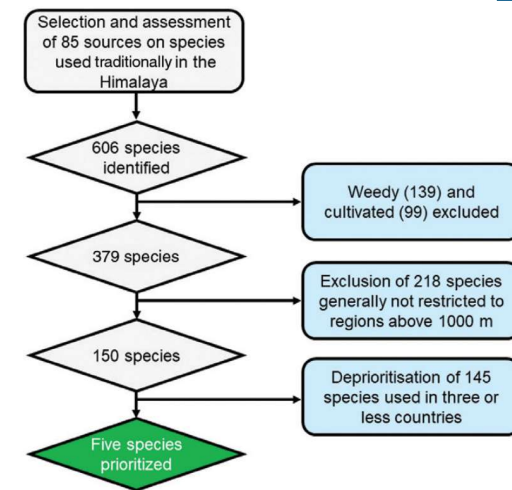


Figure 1 Flow diagram of species prioritization based on the combination of local/traditional uses for skin infections/inflammation and the use in high-altitude regions.

Integrating snake distribution, abundance and expert-derived behavioural traits predicts snakebite risk (2021)

3 GOOD HEALTH AND WELL-BEING



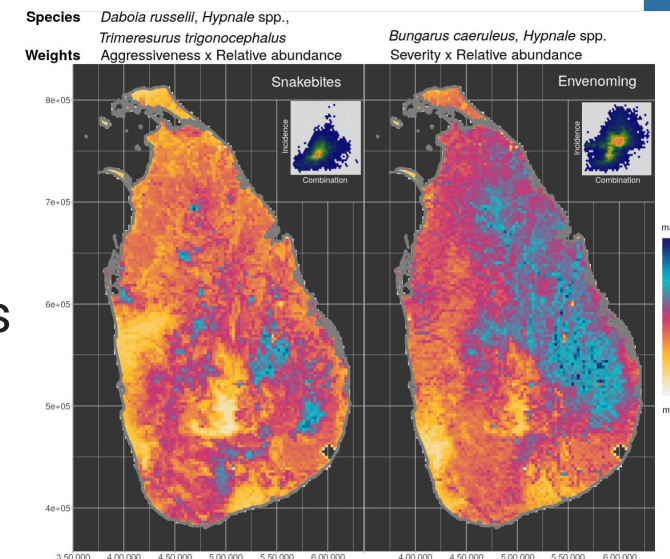
- **Application:** This study combined the spatial patterns of snakes with indices of species' relative abundance, aggressiveness and envenoming severity obtained from an expert opinion survey, to test whether these fundamental ecological traits could explain spatial patterns of snakebite and envenoming incidence. Results show that snakebite risk is explained by abundance, aggressiveness and envenoming severity of the snake species most frequently involved in envenoming cases.

- **GBIF Data:** Occurrence records of seven medically relevant, truly venomous, snake species in the Viperidae and Elapidae families in Sri Lanka.

- **Country:** Sri Lanka

- **Open Science:** Open data

- **DOI:** 10.1111/1365-2664.14081



Species' combination that maximised association with snakebite (left) and envenoming (right) incidence data. Insets in the top-right corners show scatterplots of analysed data.

Contributions to the biodiversity of Vietnam – Results of VIETBIO inventory work and field training in Cuc Phuong National Park (2022)



Application: VIETBIO [Innovative approaches to biodiversity discovery and characterisation in Vietnam] is a bilateral German-Vietnamese research and capacity building project focusing on the development and transfer of new methods and technology towards an integrated biodiversity discovery and monitoring system for Vietnam. Dedicated field training and testing of innovative methodologies were undertaken in Cuc Phuong National Park as part and with support of the project, which led to the new biodiversity data and records made available in this article collection.

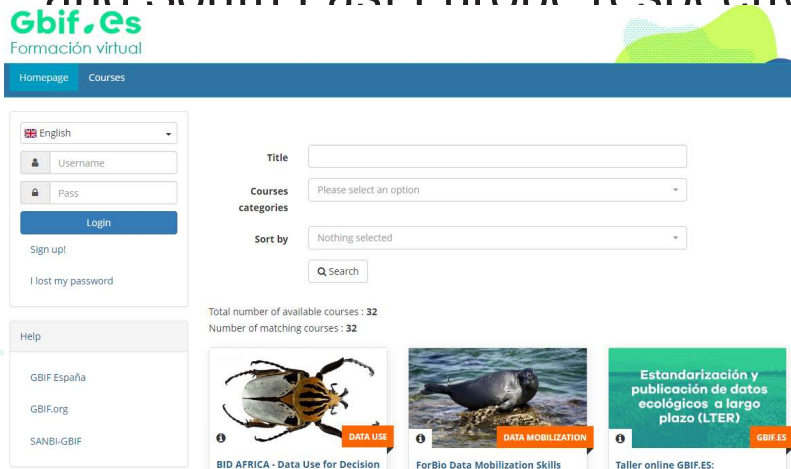


- **GBIF Data:** Occurrence data for Cuc Phuong National Park and the surrounding area.
- **Country:** Vietnam
- **Open Science:** Open data
- **DOI:** [10.3897/BDJ.10.e77025](https://doi.org/10.3897/BDJ.10.e77025)

E-learning in GBIF Capacity Activities (2019)



Application: GBIF.es offers the platform to other organizations in the community so the entire GBIF network can benefit from this service, taking advantage of the already invested resources. Additionally, Biodiversity Information for Development (BID) and Biodiversity Information for Asia (BIFA) programmes has implemented the Biodiversity Data Mobilization course for use in other programmes such as Biodiversity Data Management Skills for Students (BioDATA) and Biodiversity Information Management and Reporting (BIMR), reaching communities in Eurasia and South-East Europe respectively.



- **GBIF Data:** courses and training materials
- **Country:** Asian countries
- **Open Science:** Open educational resources
- **DOI:**10.3897/biss.3.37070

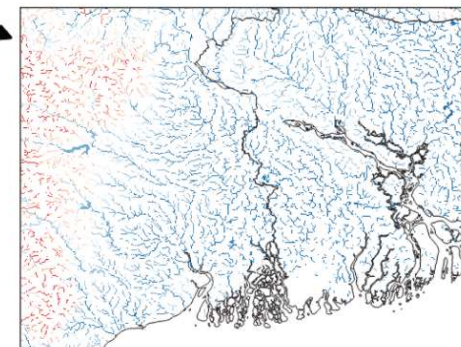
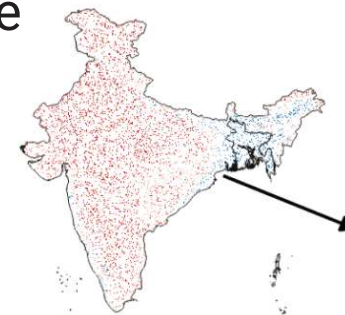
Indicator environmental variables in regulating the distribution patterns of small freshwater fish *Amblypharyngodon mola* in India and Bangladesh(2021)



Legend

Suitability Map

- Not Suitable
- Low Suitable
- Moderate
- Highly Suitable
- Excellent



Species Potential Distribution in Current Climatic Condition

50 0 50 100 150 200 km

mola in India and Bangladesh.

Application: The freshwater ecosystem is today one of the most threatened ecosystems and fishes are especially vulnerable for climate change. *Amblypharyngodon mola* is an economically and ecologically important indigenous freshwater fish species of the tropical and subtropical floodplain rivers and wetland habitats of India and Bangladesh. Modelling and mapping the distribution of *A. mola* was done for identifying the key environmental variables and predicting the potential distribution area of the species in current climatic condition.

GBIF Data: Occurrence data of *Amblypharyngodon*

Country: Bangladesh, India.

DOI:10.1016/j.ecolind.2020.106906

Open Science: Open data

Renewable energy Nexus: Interlinkages with biodiversity and social issues in Japan(2022)

7 AFFORDABLE AND CLEAN ENERGY



- **Application:** The use of renewable energy necessitates the thorough study of interlinkages with social issues such as the Sustainable Development Goals (SDGs). The goal of this research is to 1) create a high-resolution geographically explicit renewable energy potential map, 2) evaluate the SDGs nexus using the potential map, 3) discuss the improvement of renewable energy dataset, and 4) discuss nexus issues for implementing renewable energy systems in Japan.
- **GBIF Data:** The spatial distribution of observation data from 49 bird species(excluding DD with insufficient information).
- **Country:** Japan
- **Open Science:** Open data
- **DOI:**10.1016/j.nexus.2022.100069

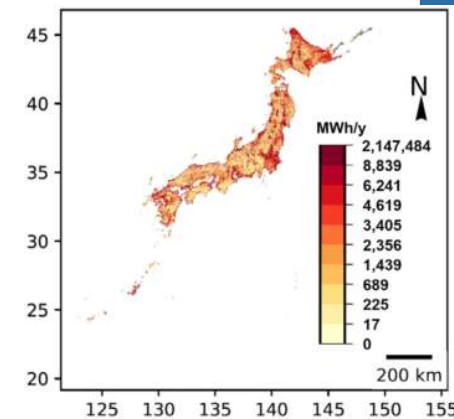


Fig. 1. Renewable energy potential map at a resolution of 500 m.

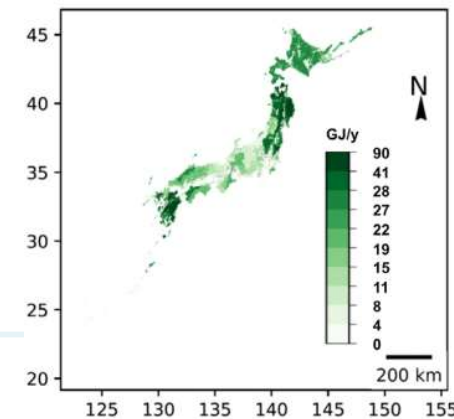
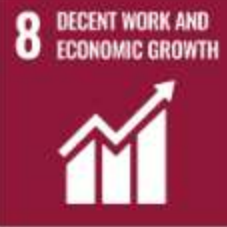


Fig. 2. Biomass potential map.

Primary productivity connects hilsa fishery in the Bay of Bengal (2020)



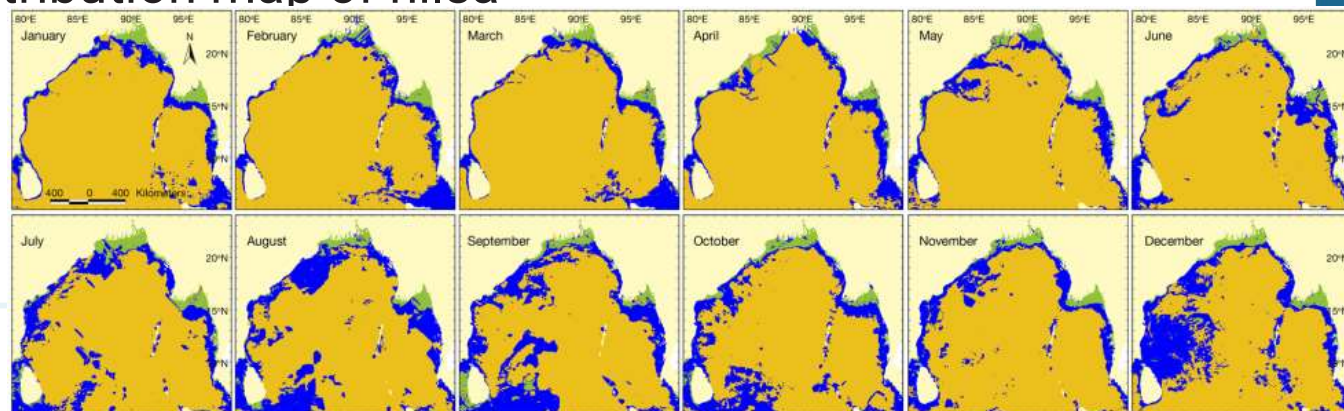
- **Application:** *Tropical hilsa shad* (*Tenualosa ilisha*) contributes significantly to the society and economy of Bangladesh, India and Myanmar, but little is known about their habitats across the life cycle and their relationship with environmental drivers. this study describes spatial and temporal variability of productivity in the Bay of Bengal (BoB) relating to hilsa fishery. Moreover, monthly abundance of phytoplankton, hilsa catch and long-term catch dynamics were analyzed to determine the associations between variables.

- **GBIF Data:** Geographical distribution map of hilsa

- **Country:** Bangladesh, India, Myanmar.

- **Open Science:** Open data

- **DOI:** [10.1038/s41598-020-62616-5](https://doi.org/10.1038/s41598-020-62616-5)



Gap analysis of Indonesian priority medicinal plant species as part of their conservation planning(2021)

10 REDUCED INEQUALITIES



- **Application:** Indonesia is a country rich in medicinal plant biodiversity. The conservation and sustainable use of such species in Indonesia are critical because of incipient population growth, changing land usage, forest clearance, and climate change. Ecogeographic data were collated from online database, herbarium specimens and living collections and then subjected to in situ and ex situ gap analysis. Other recommendations for active in situ and ex situ conservation are provided in this article which will help to ensure conservation of medicinal plants in Indonesia.

- **GBIF Data:** Data for priority medicinal plant species of Indonesia

- **Country:** Indonesia

- **Open Science:** Open data

- **DOI:**10.1016/j.gecco.2021.e01459



Bioclimatic Suitability of Actual and Potential Cultivation Areas for *Jacaranda mimosifolia* in Chinese Cities(2021)

11 SUSTAINABLE CITIES AND COMMUNITIES



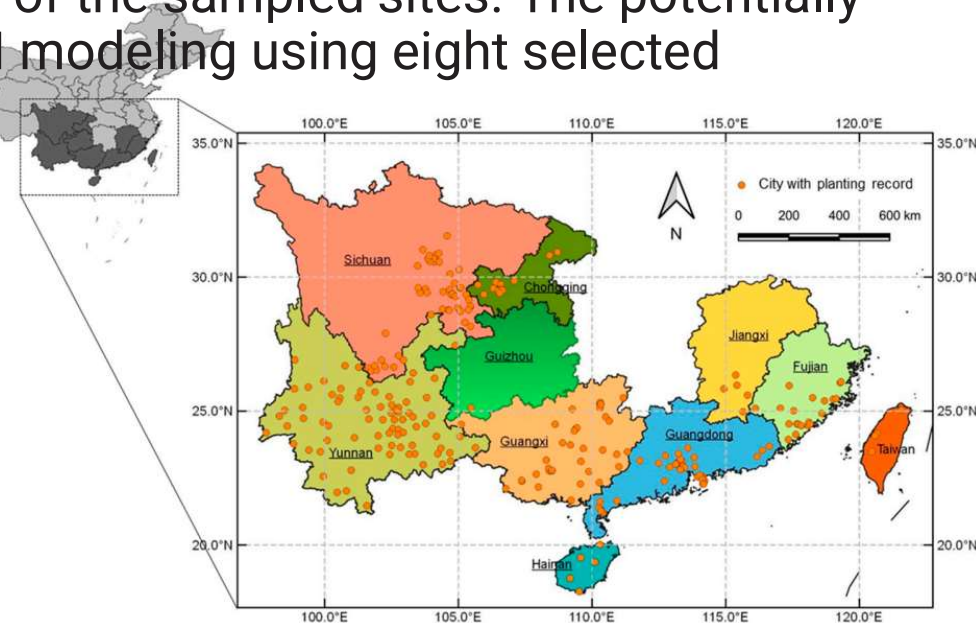
- **Application:** *Jacaranda mimosifolia* is regarded as a prized ornamental tree in the urban and has been widely cultivated in recent years in many Chinese cities. In this paper, data on the geographical coordinates of 257 planting cities were collected, and the limiting factors for cultivation were investigated using principal component analysis (PCA) of 19 bioclimatic parameters of the sampled sites. The potentially suitable habitats were predicted by BIOCLIM modeling using eight selected ecological-important climatic parameters.

- **GBIF Data:** The geographical distribution records of *J. mimosifolia*.

- **Country:** China

- **Open Science:** Open data

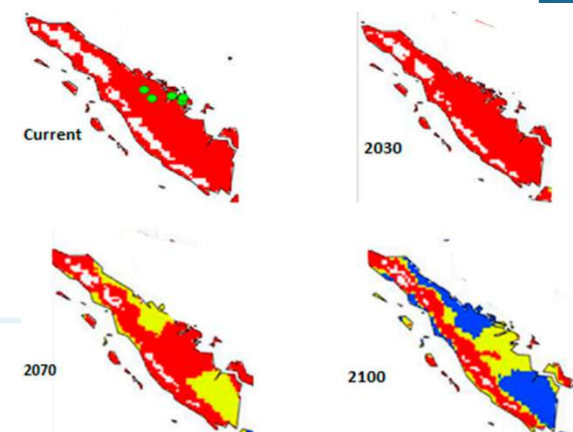
- **DOI:**10.3390/f12070951



Ganoderma boninense Disease of Oil Palm to Significantly Reduce Production After 2050 in Sumatra if Projected Climate Change Occurs(2019)



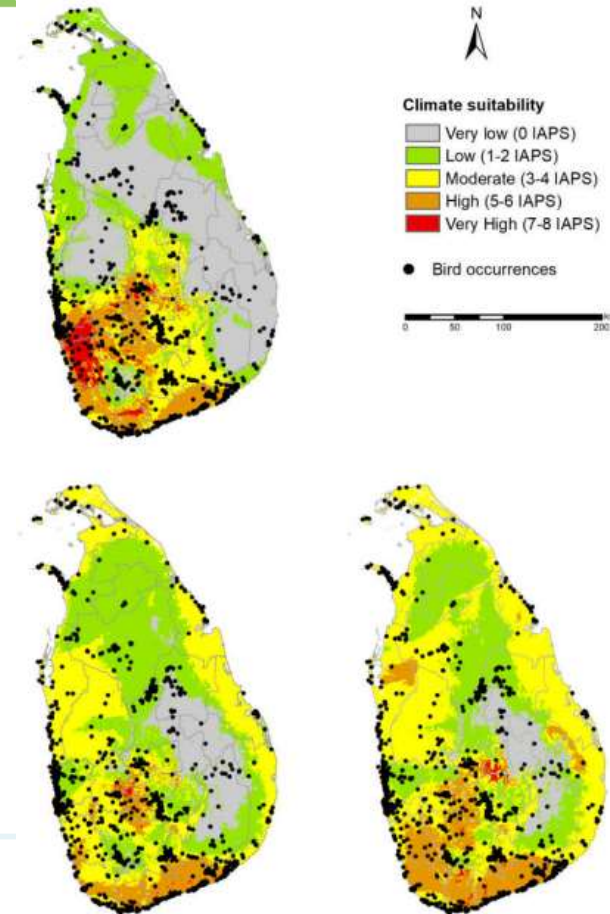
- **Application:** The more unsuitable climate will lead to concomitant increases in basal stem rot (BSR) of Palm oil, which is of major concern to sustainability in SE Asia. A novel approach is described herein, whereby (a) a determination of suitable climate for growing oil palm in Sumatra and (b) deductions to determine future BSR levels on the island were undertaken. The unsuitability of the climate for oil palm is predicted to increase dramatically after 2050 when BSR is predicted to increase to very high levels on most parts of the island. This is likely to make palm oil production unsustainable at some stage between 2050 and 2100.
- **GBIF Data:** The oil palm (*Elaeis guineensis* Jacq.) distribution
- **Country:** Indonesia
- **Open Science:** Open data
- **DOI:** [10.3390/microorganisms7010024](https://doi.org/10.3390/microorganisms7010024)



Potential Risks of Plant Invasions in Protected Areas of Sri Lanka under Climate Change with Special Reference to Threatened Vertebrates(2020)



- **Application:** The aim was to gain a general understanding of the potential risks of multiple plant invasions in PAs located in the tropical island of Sri Lanka under projected climate change. We conducted a further analysis of a multi-species climate suitability assessment, based on a previous study using MaxEnt modeling approach, and tested how species invasion may change in protected areas under climate change.
- **GBIF Data:** Occurrence of endangered amphibians, reptiles, mammals and birds in Sri Lanka
- **Country:** Sri Lanka
- **Open Science:** Open data, publication
- **DOI:**10.3390/cli8040051



Climate change and the increase of human population will threaten conservation of Asian cobras (2021)

13 CLIMATE ACTION



- **Application:** This study mapped the potential climatic niches of ten Asian cobra species for both the present and the future, with the aim to quantify changes in climate and human population densities relative to their current and future ranges. They found a higher degree of fragmentation of future cobra distributions; within the next 50 years, Asian cobras will lose an average of around 60% of their current suitable climatic range.
- **GBIF Data:** Literature and preserved specimen based occurrence records were collected from the GBIF database.
- **Country:** Asia
- **Open Science:** Open data, [publication](#)
- **DOI:** [10.1038/s41598-021-97553-4](https://doi.org/10.1038/s41598-021-97553-4)

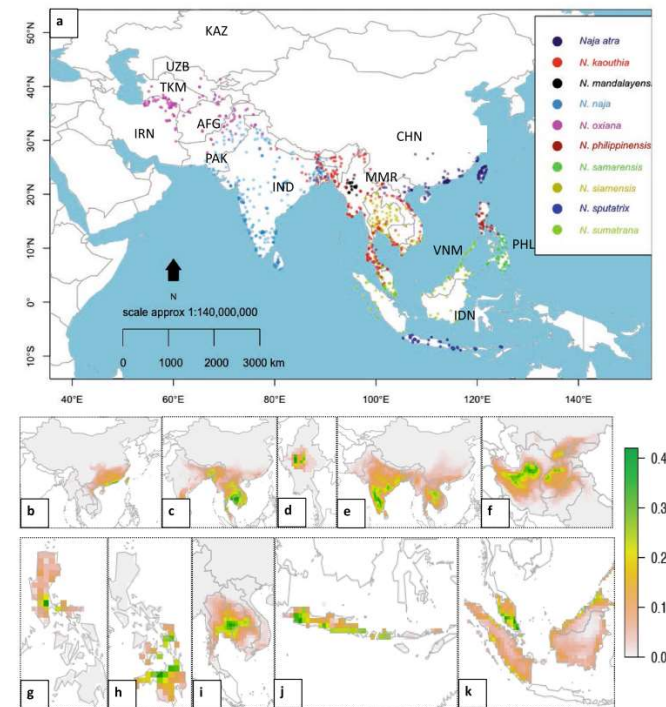


Figure 1. (a) The occurrence points of ten Asian cobras that are used in training the climate prediction model. The current potential climatic niche of ten Asiatic cobras that were produced by consensus of CCSM, CNRM, MIROC, and MIR global climate models (b) *Naja atra*, (c) *N. kaouthia*, (d) *N. mandalayensis*, (e) *N. naja*, (f) *N. oxiana*, (g) *N. philippinensis*, (h) *N. samarensis*, (i) *N. siamensis*, (j) *N. sputatrix*, and (k) *N. sumatrana*. The maps were generated from spatial polygon data frame of `wrld_simpl` function of `maptools` R-package.

Rapid marine biodiversity assessment records 16 new marine fish species for Seychelles, West Indian Ocean (2018)



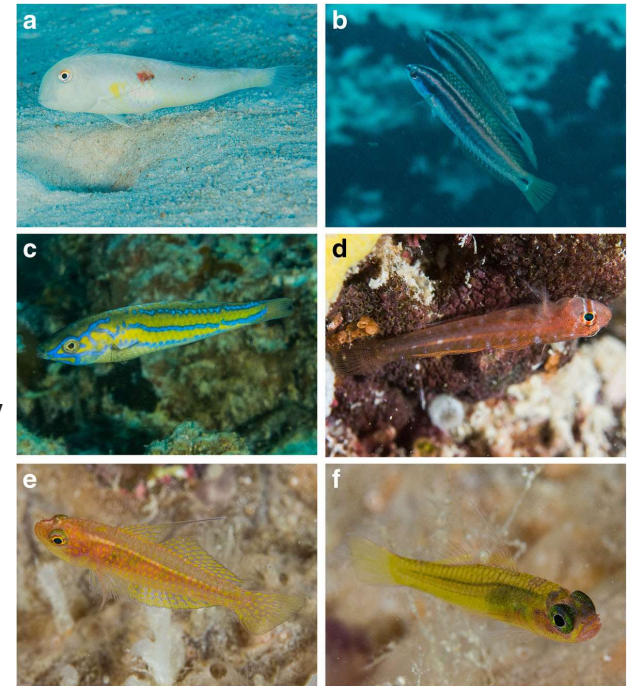
- **Application:** A rapid marine fish biodiversity assessment and subsequent surveys were conducted at D'Arros Island and St. Joseph Atoll, Amirantes, Republic of Seychelles. Dive surveys recorded the first national occurrence of 16 reef associated fish species. Ten species had regionally cosmopolitan distributions in the West Indian Ocean and their occurrence in Seychelles was expected and confirmed. The occurrence of an additional six species represented range extensions of between approximately 2000 and 4300 km further than previously reported.

- **GBIF Data:** Distributions of fish species

- **Country:** D'Arros Island and St. Joseph Atoll, Amirantes, Republic of Seychelles (West Indian Ocean)

- **Open Science:** Open data

- **DOI:** [10.1186/s41200-018-0141-6](https://doi.org/10.1186/s41200-018-0141-6)

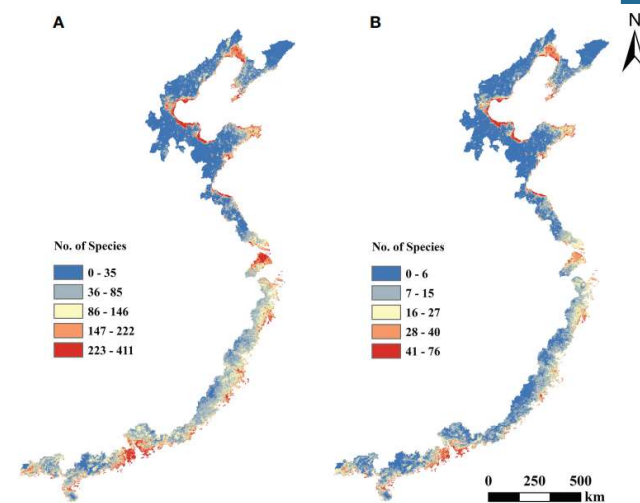


Marine fish species recorded for the first time in Seychelles waters that represent new range extensions in the Indian Ocean.

Analysis on the hotspot characteristics of bird diversity distribution along the continental coastline of China (2022)



- **Application:** In order to clarify the spatial distribution of bird biodiversity in coastal areas, based on the MaxEnt model and GIS spatial analysis, the distribution data of 488 species of birds and 15 environmental variables were used to simulate the suitable distribution areas of birds, and to analyze the spatial distribution and hotspots of bird biodiversity in coastal areas.
- **GBIF Data:** Birds recorded in the study area since 2000.
- **Country:** The continental coastline of China
- **Open Science:** Open data
- **DOI:** 10.3389/fmars.2022.1007442



Biodiversity distribution pattern of All birds in coastal areas (A) and national key protected birds (B).

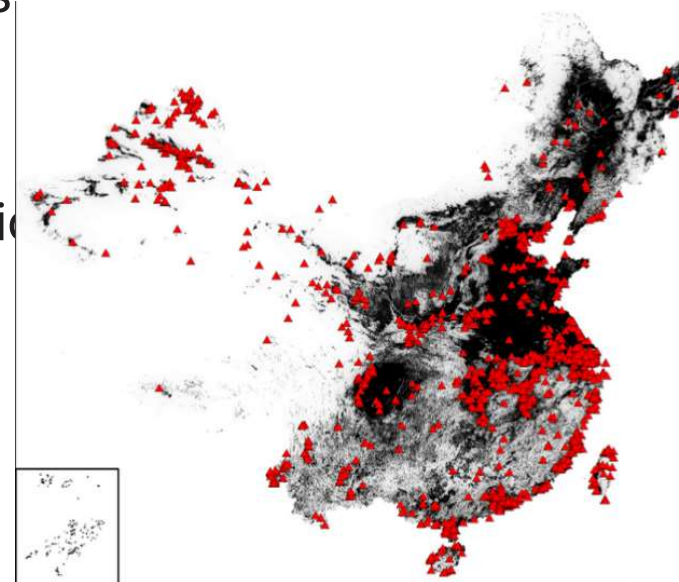
Using citizen science data to inform the relative sensitivity of waterbirds to natural versus human-dominated landscapes in China (2022)

15 LIFE ON LAND



- **Application:** This paper apply a bootstrapping procedure to citizen science data to reduce sampling biases and report the relative sensitivity of waterbird species to natural versus human-dominated landscapes. Analyses are performed on 30,491 data records for 69 waterbird species referred to five functional groups observed in China between 2000 and 2018. It demonstrate the potential for citizen science data to assist in conservation planning in the context of landscape changes.
- **GBIF Data:** occurrence data of waterbird
- **Country:** China
- **Open Science:** Open data, **citizen science**
- **DOI:** [10.1002/ece3.6449](https://doi.org/10.1002/ece3.6449)

Occurrences of *Ardea alba*

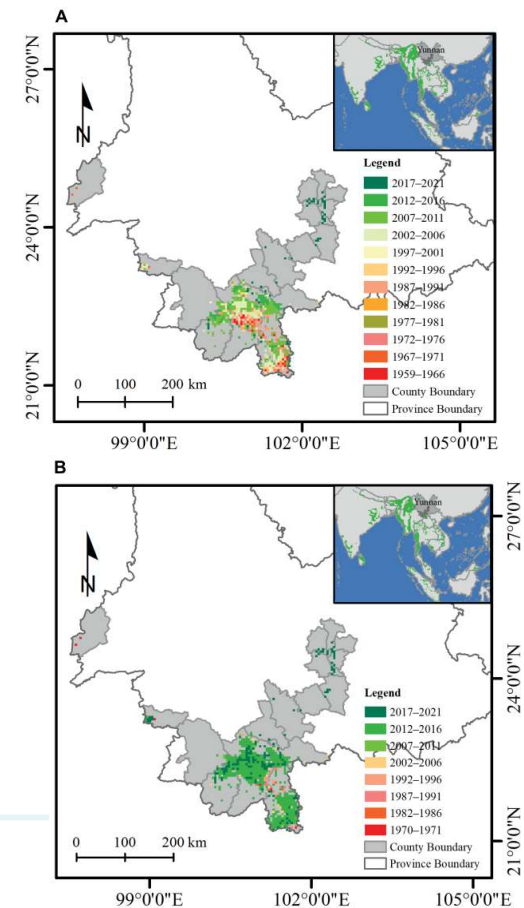


The recent Asian elephant range expansion in Yunnan, China, is associated with climate change and enforced protection efforts in human-dominated landscapes (2022)

15 LIFE ON LAND



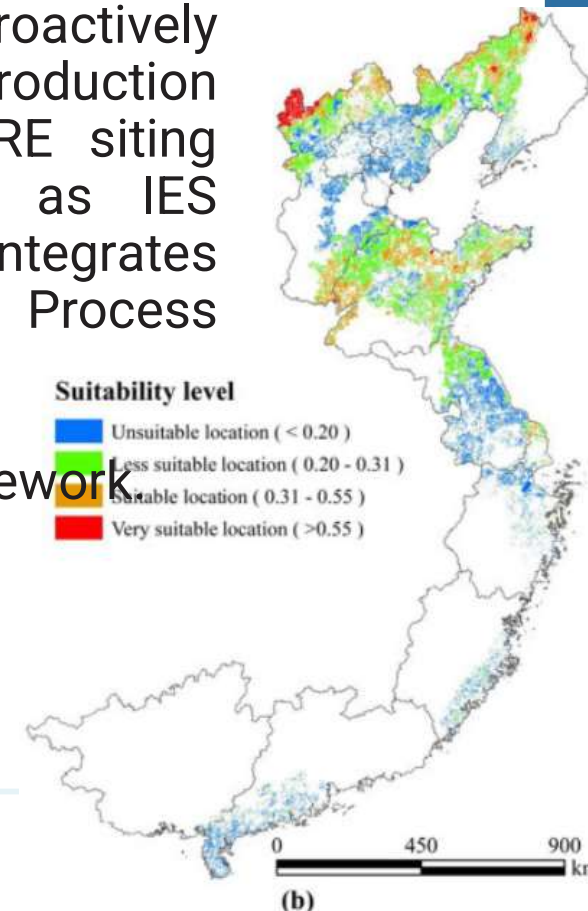
- **Application:** This study quantified the relationship between climate change and human impacts on the recent range expansion of Asian elephants in southwest China. It was found that the first observation probability of this species in a new place during 1959–2021 had a significant and positive association with change in air temperature and human density. Climate change and enforced protection efforts in human-dominated landscapes in the last few decades are significant drivers of the recent range expansion of Asian elephants in Yunnan, China.
- **GBIF Data:** Occurrence records of Asian elephants
- **Country:** China
- **Open Science:** Open data
- **DOI:** [10.3389/fevo.2022.889077](https://doi.org/10.3389/fevo.2022.889077)



A practical wind farm siting framework integrating ecosystem services – A case study of coastal China(2021)



- **Application:** A sustainable RE deployment scheme should proactively identify and manage the potential trade-offs between RE production and ES provisioning. This study proposed a practical RE siting framework that integrates ES considerations (named as IES framework), and formulated a novel method that integrates Geographic Information Systems, fuzzy Analytic Hierarchy Process and Weighted Slacks-based Measure to implement this framework. Then, the suitability of wind farm sites in coastal China was evaluated and mapped using the IES framework.
- **GBIF Data:** Bird observations occurrences
- **Country:** China
- **Open Science:** Open data
- **DOI:** 10.1016/j.eiar.2021.106636



Virtual Herbarium ALTB: collection of vascular plants of the Altai Mountain Country(2021)



- **Application:** The Virtual Herbarium ALTB (Russian interface - altb.asu.ru) is the largest digital collection of plants from the transboundary territory of the Altai Mountain Country and the main source of primary material for the "Flora Altaica" project. The main purpose of this article is to attract the attention of the scientific community to the botanical research of transboundary territory of the Altai Mountain Country (Russia, Kazakhstan, China and Mongolia) and to the future development of digital plants collections in partnership with GBIF.



- **GBIF Data:** 1,176 medicinal plants and 296 food plants.
- **Country:** China, Kazakhstan, Mongolia, Russia.
- **Open Science:** Open data
- **DOI:**10.3897/bdj.9.e67616