SUSTAINABLE DEVELOPMENT GOALS

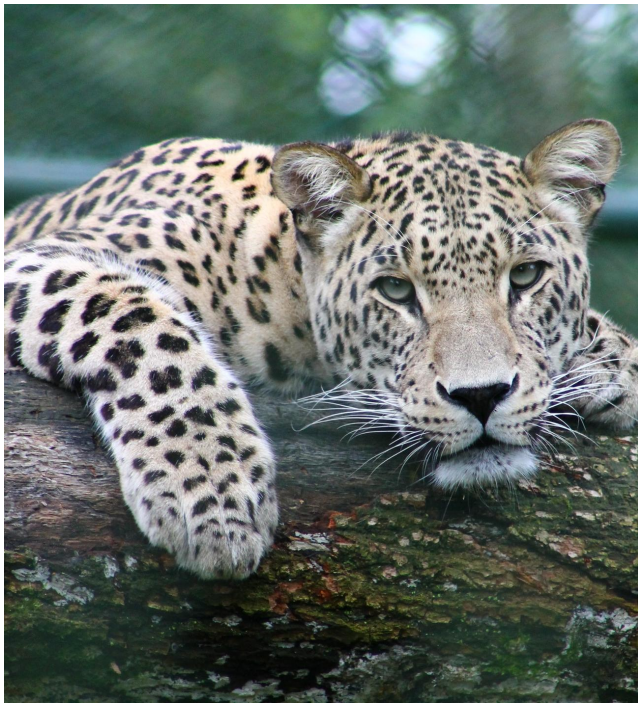
CITIZEN SCIENCE GUIDE FOR UNITED NATIONS SDG INDICATORS

15.life on land
Indicator 15.5.1

INTRODUCTION

Biodiversity is extremely important to maintain the ecological system. Most importantly, many species of plants and animals are dependent on each other. Therefore if one of them gets extinct, the others will start getting endangered too. Moreover, it is important for humans too because our survival depends on plants and animals. for instance, humans need food to survive which we get from plants. If the earth does not give us a favorable environment then we cannot grow any crops. As a result it will no longer be possible for us to sustain on this planet. **SDG15** focuses specifically on managing forest sustainability, restoring degraded lands and successfully combating desertification, reducing degraded natural habitats and ending biodiversity loss. Goal 15 seeks to protect , restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, and halt and reverse land degradation and halt biodiversity loss. preserving diverse forms of life on land requires targeted efforts to protect, restore and promote the conservation and sustainable use of terrestrial and other ecosystems.

TARGET 15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.



EXPLANATION: This target aims to promote countries to take preventive measures and actions to protect the natural environment in order to stop the loss of biodiversity. One of the primary aims of the target is to protect the extermination of rare and threatened species on earth. This target through indicator 15.5.1 builds a bridge between the International Union for Conservation of Nature (IUCN). In an effort to avoid reinventing the wheel, SDG 15.5.1 has directly adopted and integrated the Red List Index in the process.

Insight *: World's fastest land animal Cheetahs. There are only 7100 cheetahs left in the wild globally. They are termed as highly vulnerable according to the IUCN Red List Index.*

INDICATOR 15.5.1: Red List Index. Custodian organization: International Union for Conservation of Nature (IUCN), Bird Life International (BLI).

It implies that indicator 15.5.1 is a way to reiterate the significance of Red List Index in halting and protecting the global biodiversity loss. Therefore, it is imperative to gain in depth understanding of Red List Index in order to contribute to the indicator 15.5.1 and the respective target.

WHAT IS A RED LIST INDEX?

The Red List Index measures change in aggregate extinction risk across groups of species. The RED List Index values ranges from 1 to 0, in which value of 1 indicates no threat to any species are categorized as 'LEAST CONCERN' and value of 0 are categorized as 'EXTINCT'. This value has deteriorated from 0.82 in 1993 to 0.73 globally in 2019. Thus the Red List Index allows comparisons between sets of species of both their overall level of extinction risk (i.e., how threatened they are on average),and in the rate at which this risk changes over time.

RATIONALE

Globally human activities are pushing thousands of species towards extinction. As a result, the world is today facing an extinction crisis. The world's species are impacted by a number of threatening processes, including habitat destruction and degradation,over exploitation, invasive alien species, human disturbance, pollution and climate change. This indicator can be used to assess overall changes in the extinction risk of groups of species as a result of these threats and the extent to which threats are being mitigated.

FUNCTION

The Red List Index (RLI), based on the IUCN Red List of Threatened Species, is an indicator of the changing state of global biodiversity. It defines the conservation status of major species groups, and measures trends in extinction risk over time.

COMPUTATION METHOD

The Red List Index value is calculated by multiplying the number of species in each red list category by the category weight (0 for Least Concern, 1 for Near Threatened, 2 for Vulnerable, 3 for Endangered, 4 for Critically Endangered, 5 for Extinct, Data Deficient species are excluded) these products are summed divided by the maximum possible product (number of species multiplied by maximum weight of 5) and subtracted from one. This produces an index value value that ranges from 0 to 1.

Mathematically this calculation is expressed as:

$$RLIt = 1 - [(Ss\ Wc(t,s) / (WEX * N)]$$

Where Wc (t,s) is the weight for category (c) at time (t) for species (s) (the weight for 'Critically Endangered' = 4, 'Endangered' = 3, 'Vulnerable' = 2, 'Near Threatened' = 1, 'Least Concern' = 0. 'Critically Endangered' species tagged as 'Possibly Extinct' or 'Possibly Extinct in the Wild' are assigned a weight of 5); WEX = 5, the weight assigned to 'Extinct' or 'Extinct in the Wild' species; and N is the total number of assessed species, excluding those assessed as Data Deficient in the current time period, and those considered to be 'Extinct' in the year the set of species was first assessed.

INTERPRETATION

The Red List Index provides an indicator of trends in species extinction risk, as measured using the IUCN Red List Categories and Criteria, and is compiled from data on changes overtime in the Red List Category for each species, excluding any changes driven by improved knowledge or revised taxonomy.

- An upward Red List Index trend would indicate that the SDG target 15.5 of reducing the degradation of natural habitats and threatened species is on track.

- A Red List Index value of 1 would indicate that biodiversity loss has been halted.

LIMITATIONS

- The main limitations of the Red List Index is related to the fact that the Red List Categories are relatively broad measures of status, and thus the Red List Index for any individual taxonomic group can practically be updated at intervals of at least four years. As the overall index is aggregated across multiple taxonomic groups, it can be updated typically annually.In addition, the Red List Index does not capture particularly well the deteriorating status of common species that remain abundant and widespread but are declining slowly.

- Another major limitation is the inconsistency between species assessments.These can be minimized by the requirement to provide supporting documentation detailing the best available data, with justifications, sources, and estimates of uncertainty and data quality, which are checked and standardized by IUCN through Red List Authorities, a Red List Technical Working Group and an independent Standards and Petitions Sub-committee.

WHAT CAN CITIZEN SCIENCE COMMUNITY DO?

In order effectively contribute towards monitoring this indicator, it is imperative to understand the foundations and methodologies followed by the ICUN. Here we will cover the basics of assessment and categorization of species.

- **Assessment in this context:** Assessment in itself is an estimate of extinction risk, highlighting those species that are most likely to become extinct in the near future given current knowledge of population trends, recent, current or projected threads acting on the species. Basically, RLI considers all the described taxa for assessment except humans and microorganisms i.e almost all the species in the world for which have enough biological and ecological information. It also considers unsubscribed species under a few conditions.

    - If scientist description is underway
    - Proof of clear benefit of conserving the species is furnished.

- **Population of interest** : Only the population in the natural range and areas outside the natural range created for conservation purposes of the population are considered for assessment. Captive populations or populations introduced outside their natural range could be mentioned in the supporting documents but should not be added in assessment of extinction risk.

- **Types of data used :** Information on a species or taxa is usually extracted from published literature, articles, grey literature (unpublished literature) and the Scientist's personal experience and observation.

    - Assessment and classification according to the IUCN Red List Categories and Criteria guidelines

    - The 1994 IUCN Categories and Criteria were developed to improve objectivity and transparency in assessing the conservation status of species, and therefore to improve consistency and understanding among users.

- **Red List Index compilation and management**: Red List Categories and Criteria. The IUCN Red List of Threatened Species is essentially a checklist of taxa that have undergone an extinction risk assessment using the IUCN A red list index showing the percentage of species threatened in the selected taxa. ecology, etc. Species survival commission (SSC) and Red list partners along with IUCN manages the red list index.

WHO CAN CONTRIBUTE TO THIS ASSESSMENT?

The majority of assessments appearing on The IUCN Red List are carried out by members of the IUCN Species Survival Commission (SSC), appointed Red List Authorities (RLAs), Red List Partners, or specialists working on IUCN-led assessment projects. However, assessments can really be carried out by anyone who has sufficient knowledge of a species and submitted to IUCN for consideration.

- As an individual, one can contribute towards this indicator as an independent assessor, contributor and reviewer depending on your passion and expert level which is evaluated by the committee at the IUCN.
- Independent assessor/Reviewer - experts who compile the data according to the IUCN guideline to carry assessments.
- Contributors - Any one who is interested in helping the assessors in gathering, analyzing data in parts.For example, carrying out literature review on a specific species to obtain data helping the assessment.

NOTE : Any interested individuals can get trained and become a certified independent assessor through their online Red List Training program - https://www.iucnredlist.org/resources/online

CONCEPTS AND DEFINITIONS

1. What is biodiversity?

The term BIODIVERSITY refers to the variety of life on Earth at all its levels, from genes to ecosystems, can encompass the evolutionary, ecological, and cultural processes that sustain life.

2. What is the International Union for Conservation of Nature (IUCN)?

IUCN is a democratic Union established in 1948 in France that brings together the world's most influential organisations and top experts in a combined effort to conserve nature and accelerate the transition to sustainable development. https://www.iucn.org/

3. What is a taxa?

Taxa is a plural form of taxon. A particular level of hierarchy in the classification of living beings is called a taxon. A taxon is a group of one or more populations of an organism or organisms seen by taxonomists to form a unit.For example, the basic level of classification is species, followed by genus, family, order, class, phylum or division, in ascending order. The highest level of classification is known as a kingdom. So each of these categories can be called a taxon.

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