Benefits of Essential Biodiversity Variables (EBVs)
for the CBD Post-2020 Global Biodiversity Framework

The Challenge: There is currently great heterogeneity in the development and the use of indicators by Parties to the Convention on Biological Diversity (CBD), with most indicators derived from nationally sourced data and therefore often lacking global applicability[1][2]. This variety of indicators and evidence underpinning them strongly limits potential synergies between national and global target tracking and constrains the ability to quantify and compare national progress towards meeting global goals. Further, many of the current Aichi Biodiversity Targets are not well measured by indicators at national or global scales[3], lacking spatially explicit information, such as maps. To ensure that the new post-2020 Global Biodiversity Framework is adequately supported, reviewed and monitored, new approaches are needed that facilitate the powerful synergies possible between national and global target tracking[4].

Meeting the Challenge: GEO BON operates as a global network, aiming to improve the acquisition, coordination and delivery of enhanced biodiversity data for timely and effective conservation policy-making. Essential Biodiversity Variables (EBVs) provide a standard yet flexible framework that allows for the production of scalable indicators that can facilitate a more coherent means for tracking progress from national to global scales[5].

Institutional connectivity of GEO BON in biodiversity governance and data providers

1. **GEO BON** aims to connect biodiversity observation networks and monitoring organizations – both field scientists and remote sensors – to intergovernmental nature-focused policy processes, such as the CBD and IPBES.
2. The **EBV framework** brings datasets into an open hierarchical methodology that facilitates calculation of indicators to track progress against biodiversity targets and support decision-making at multiple scales, from a network of underlying biodiversity and environmental datasets that follow globally adopted standards.
3. The **EBV indicators** are a part of and can contribute to existing policy support initiatives and tools such as the Biodiversity Indicators Partnership (BIP) and ones in development such as the Target Tracker.

[1] Han, X., Gill, M., Hamilton, H., Vergara, S., and Young, B. (2019). Progress on National Biodiversity Indicator Reporting and Prospects for Filling Indicator Gaps in Southeast Asia. Environmental and Sustainability Indicators. In Press.
[2] Bhatt. R., Gill, M., Hamilton, H., Han, X., Linden, H., and Young, B. (2019). Uneven Use of Biodiversity Indicators in Fifth National Reports to the Convention on Biological Diversity. Environmental Conservation, 1-7. Doi: 10.1017/S0376892919000365
[3] CBD Secretariat. USE OF INDICATORS FOR TRACKING PROGRESS. Post 2020 Thematic Consultation on Transparent Implementation, Monitoring, Reporting and Review. 20-22 February 2020, Rome.
[4] CBD Secretariat. NATIONAL REPORTING. Post 2020 Thematic Consultation on Transparent Implementation, Monitoring, Reporting and Review. 20-22 February 2020, Rome.
[5] Pereira, H. M. et al. (2013). Essential Biodiversity Variables. Science 339, 277–278.

Four major benefits of GEO BON's EBV-based approach to developing and applying biodiversity change indicators

GEO BON's EBV-based indicators enable:

Example based on CSIRO & PREDICTS
Global Biodiversity Change Indicators
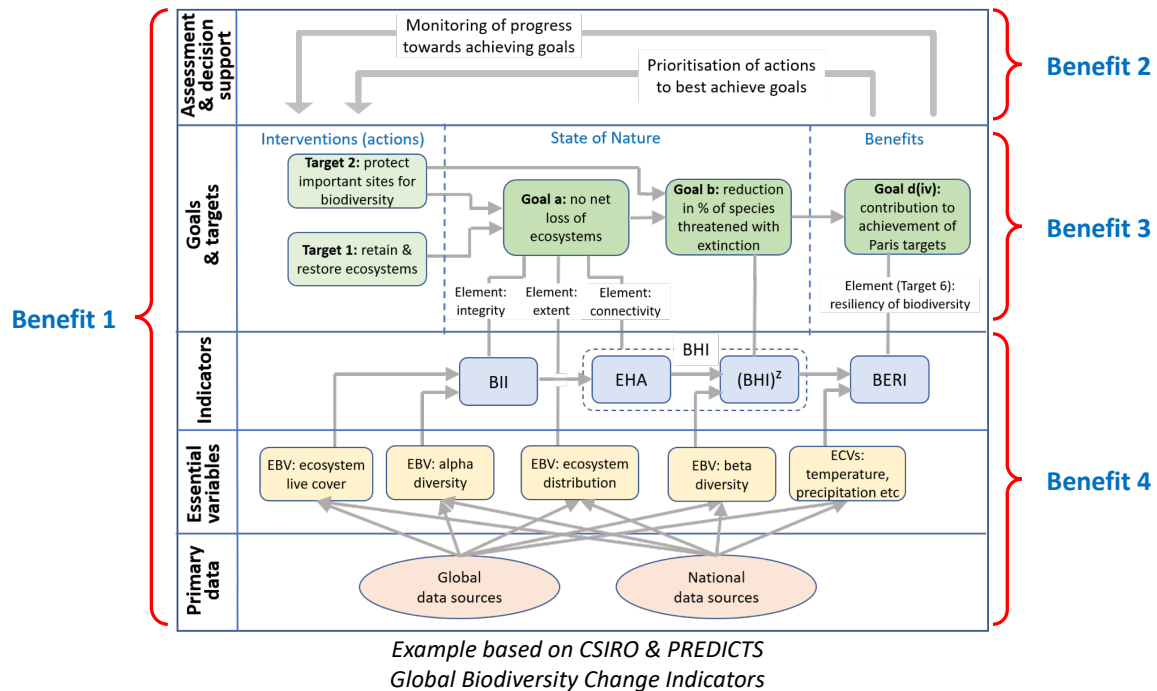
***Indicators**: BII – Biodiversity Intactness Index, EHA – Effective Habitat Area
BHI - Biodiversity Habitat Index, BERI – Bioclimatic Ecosystem Resilience Index

Figure 1. Four benefits of EBV-based indicators for policy support with data workflow

Benefit 1. Data and indicators for CBD national and global strategic planning and reporting

EBVs can be the back-bone for integrating CBD national planning and reporting mechanisms with global targets[6]. EBVs can be easily aligned with stated goals and targets in the National Biodiversity Strategies and Action Plans (NBSAPs) to help track them. National Reports (NRs) could report the changing state and trend of different EBVs in the NBSAPs. National datasets for EBVs reporting could be used to model global EBVs and EBV-derived global indicators for tracking global targets.
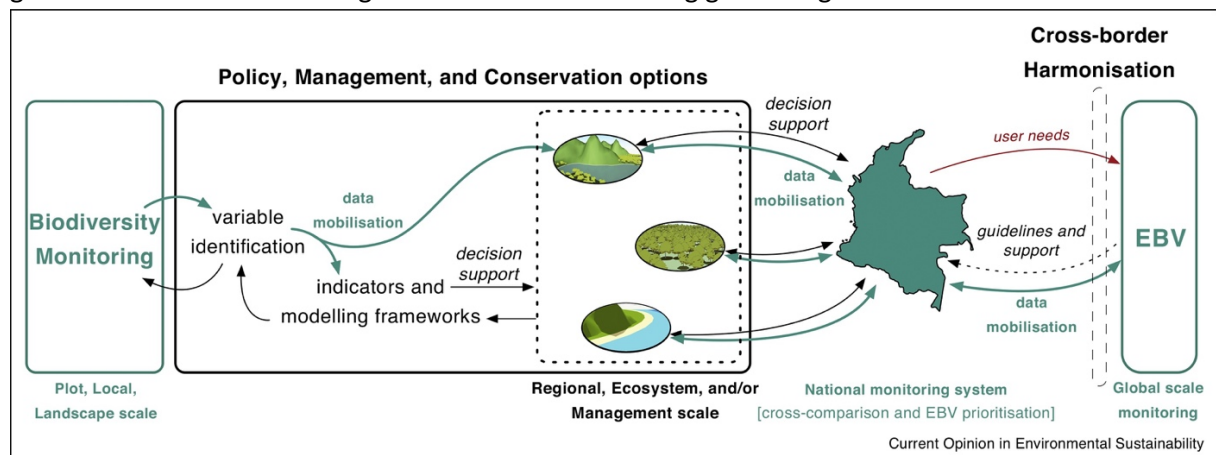

Figure 2. A cross-scale approach for global biodiversity monitoring with EBVs (Source: Navarro et al. 2017)

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[6] Navarro, L. M. et al. (2017). Monitoring biodiversity change through effective global coordination. Current opinion in environmental sustainability, 29, 158-169.

Benefit 2. Spatial comprehensiveness for actionable guidance on prioritization and monitoring

EBVs can be spatially complete, thus allowing for the generation of indicators with global coverage for a more accurate and comparable accounting of biodiversity and ecosystem changes at any given location. Integrating remotely-sensed and field-based data, modelling-based EBVs allow spatially-explicit prioritisation of potential actions to best achieve goals, to be coupled with spatially-explicit monitoring of actual progress in achieving goals resulting from implemented actions.

Benefit 3. Complementary datasets for monitoring multiple targets and goals

EBVs represent diverse levels and facets of organisms from genes to ecosystems and they can be used to derive indicators that inform different goals and targets in a unified (interconnected) framework. The employment of common underpinning EBV-compatible datasets across multiple indicators also allows interactions and dependencies between targets and goals.

Benefit 4. Scalability of indicators for use from global to sub-national levels

EBVs are spatially explicit and, by definition, scalable from sub-national to national to regional and global scales, thereby allowing for consistent target tracking at all scales. In situ (field-based) data at more local scales can also be used to progressively validate and calibrate predictions derived from global-scale modelling.

List of CBD endorsed indicators developed via GEOBON based on the EBV concept

1. Bioclimatic Ecosystem Resilience Index (Goal 4, Target 6)
2. Biodiversity Habitat Index (Goal 1, Target 1)
3. Biodiversity Intactness Index (Goals 1 & 2)
4. Protected Area Connectedness Index (Goal 1, Target 2)
5. Protected Area Representativeness Index (Goal 1, Target 2)
6. Species Habitat Index (Goal 1 & 2, Target 1)
7. Species Protection Index (Goal 2, Target 2)
8. Species Status Information Index (Target 18)