



Food and Agriculture
Organization of the
United Nations

18th Working Session of the Intergovernmental Technical Panel on Soils (ITPS)

21-23 March 2023
Fao Headquarters
Rome, Italy

Updates from NETSOB and GLOSOB

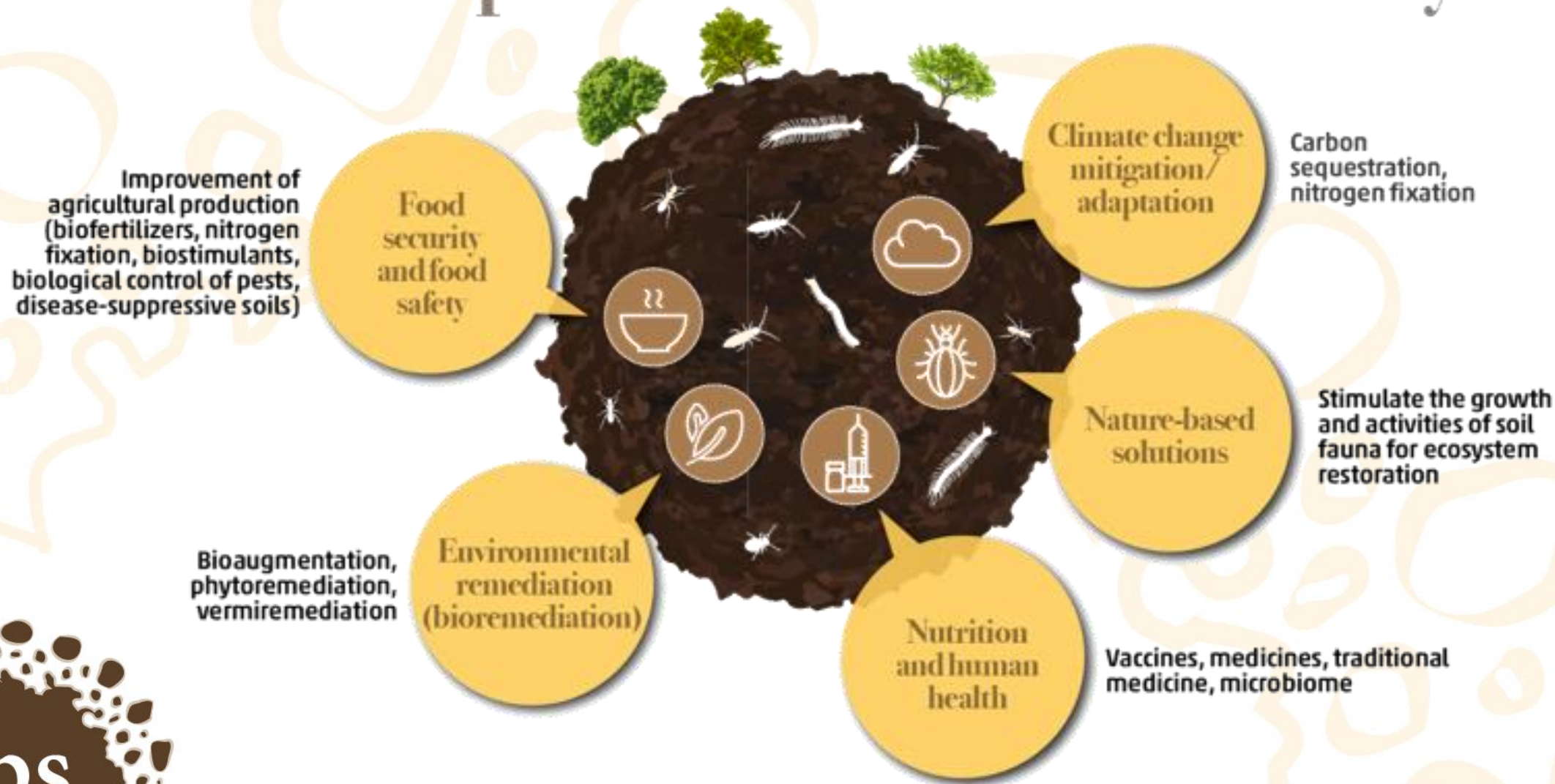
Jacob Parnell & Rosa Cuevas

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INTERGOVERNMENTAL
TECHNICAL PANEL ON SOILS



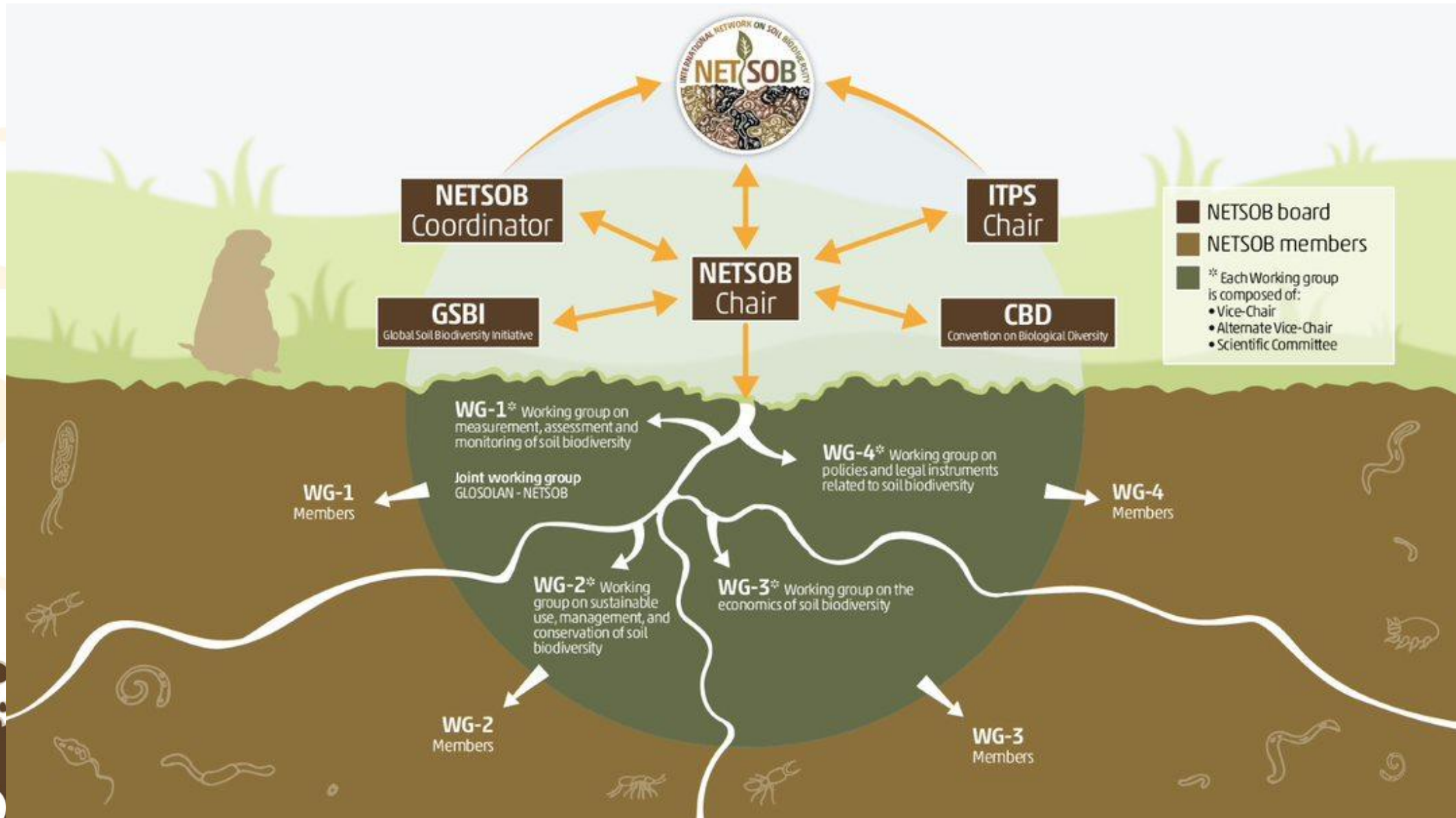
What are the potentialities of soil biodiversity?



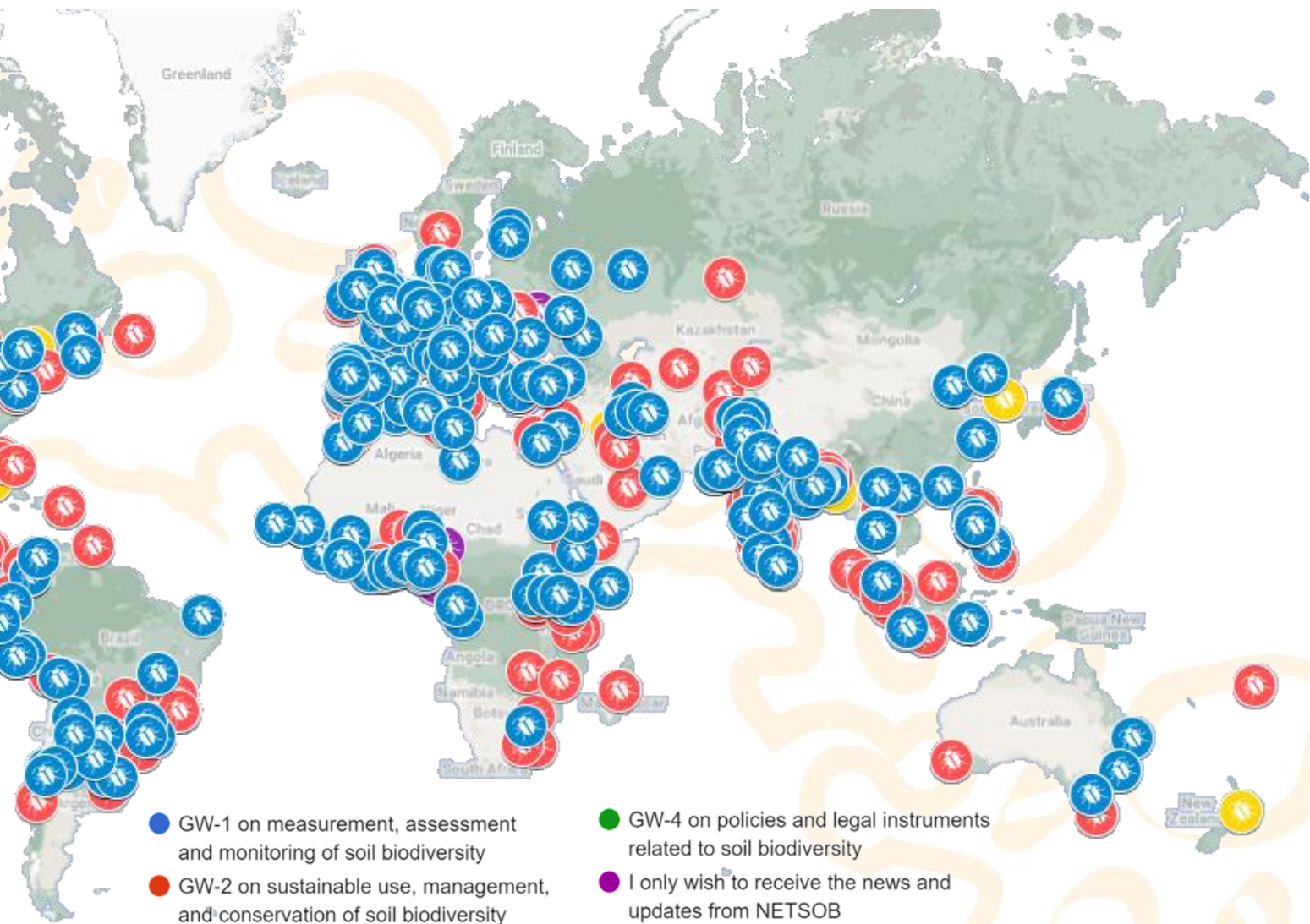
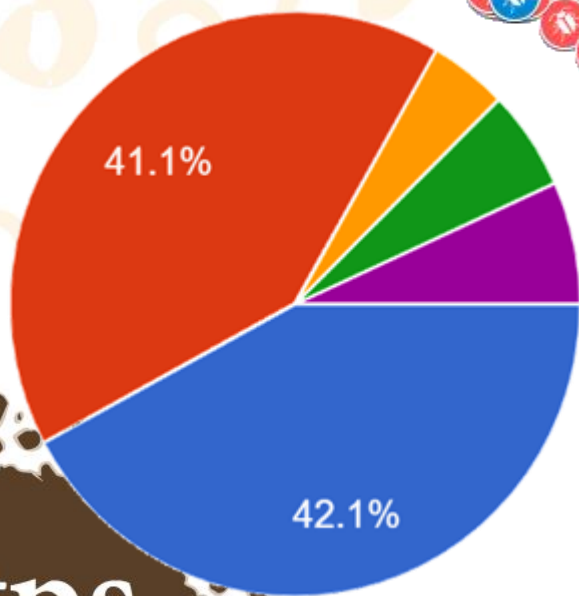
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- GW-1 on measurement, assessment and monitoring of soil biodiversity
- GW-2 on sustainable use, management, and conservation of soil biodiversity
- GW-3 on the economics of soil biodiversity
- GW-4 on policies and legal instruments related to soil biodiversity
- I only wish to receive the news and updates from NETSOB

WG-1 MEASUREMENTS

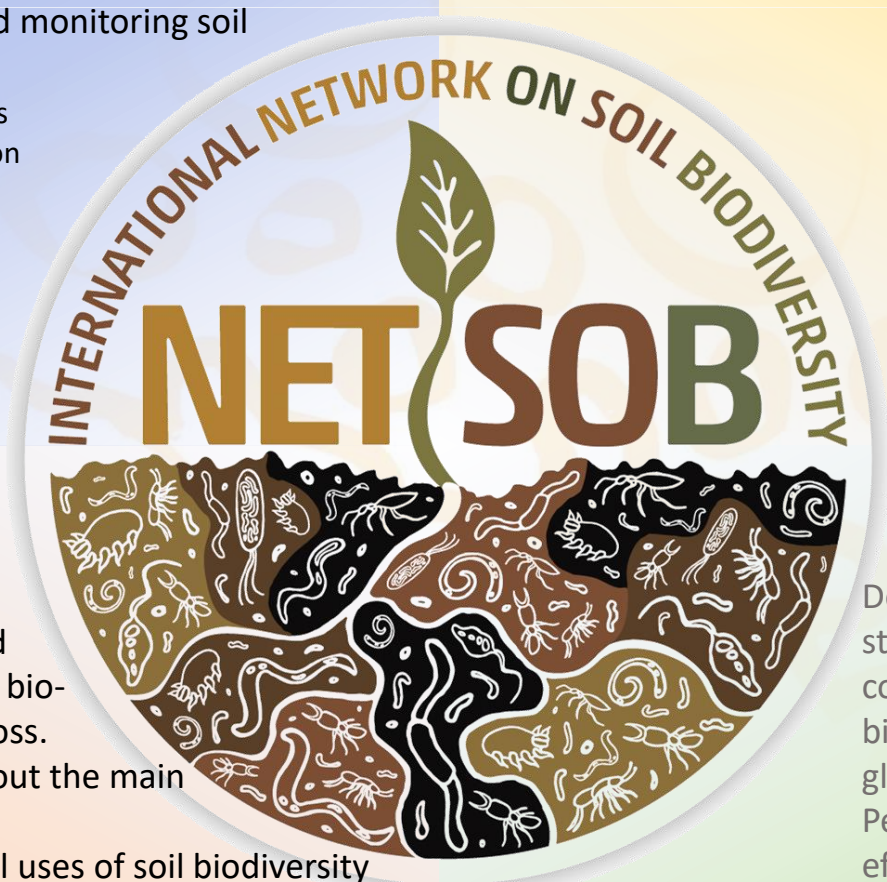
Identify indicators of soil biodiversity that are related to key ecosystem functions and services, priorities, tiers for GLOSOB. Guidelines for measuring, assessing and monitoring soil biodiversity.

- SOPs (microbes): Microbial Enzyme Activities (B-Glucosidase, Arylsulfatase), N Mineralization by incubation method.
- SOPs (microfauna): Nematodes trophic groups by wet extraction.
- SOPs (mesofauna): QBSar
- SOPs (macrofauna): ISO-TSBF

[Case Studies Submission Portal](#)
[Submission Portal for Main Topics](#)

WG-2 PRACTICES

Development of a field manual on good management practices to conserve soil biodiversity and prevent soil biodiversity loss. Development of a *technical booklet* about the main soil-borne diseases. Development of a database of potential uses of soil biodiversity for bioremediation and restoration of degraded soils. Prepare training material (including videos) and organize webinars on the analysis of soil biological parameters



Development of the methodology for the economic valuation of soil biodiversity.



Development of policy briefs on the state of knowledge, protection, conservation, and sustainable use of soil biodiversity at national, regional, and global levels. Performance of an assessment of effective policies and legal instruments to control soil biodiversity loss.

WG-3 ECONOMICS

WG-4 POLICIES

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NETSOB WG-2 Proposed Timeline

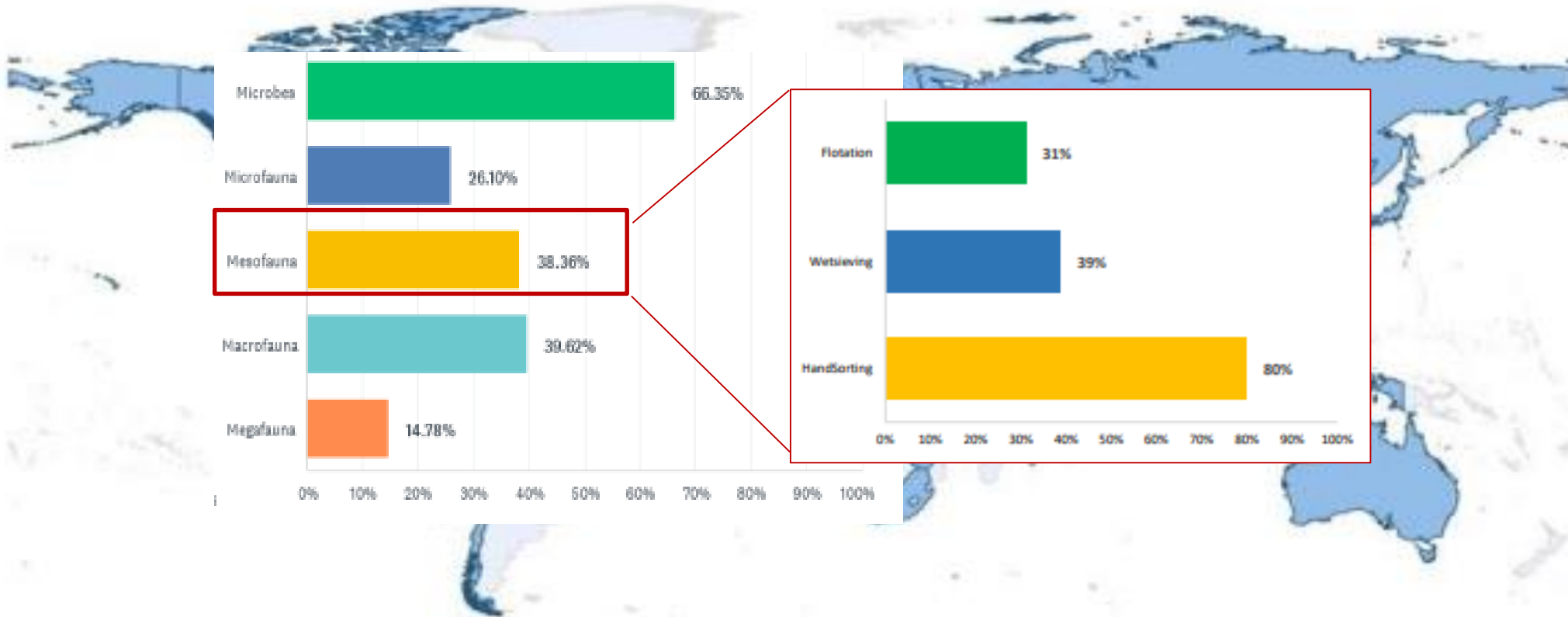
Activity	Due dates	Responsible persons
Author submission deadline.	May 15, 2023	Leading and contributing authors
The first round of review: selected contributions returned to authors for revision.	June 30, 2023	GSP Secretariat, WG-2 Scientific Committee, WG-2 Vice-chair
Submission of revised contributions from authors.	July 30, 2023	Leading and contributing authors
The second round of review: final decisions on contributions for acceptance.	September 30, 2023	GSP Secretariat, WG-2 Scientific Committee, WG-2 Vice-chair
Style and scientific edition, elaboration of figures/tables and final layout.	November 31, 2023	GSP Secretariat



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Status of soil biodiversity information



Countries highlighted in blue have some form of soil biodiversity monitoring program. They don't always measure the same taxonomic groups. Even when they do, different methods are often used in different monitoring programs.

SOURCE: Brown et al., in prep. Global Survey on Soil Biodiversity

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Recommendation for a Global Effort



CBD



Convention on
Biological Diversity

Distr.
GENERAL

CBD/COP/15/2
15 October 2022*

ORIGINAL: ENGLISH

Soil BON

GLOBAL SOIL
PARTNERSHIP



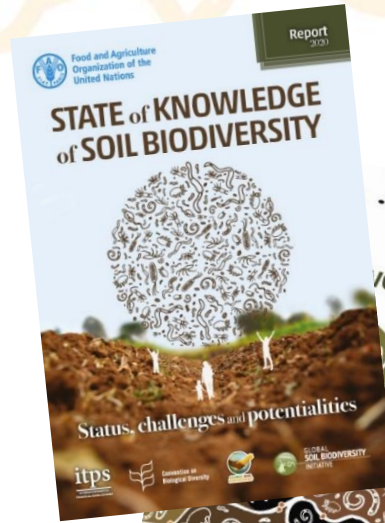
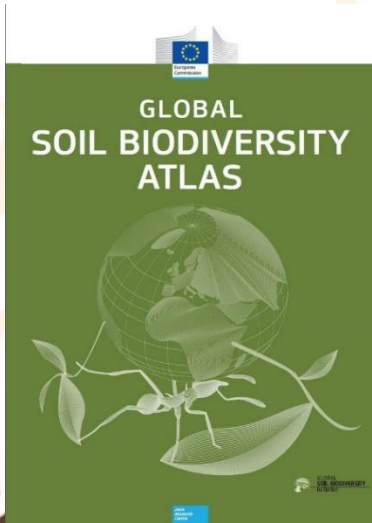
CONFERENCE OF THE PARTIES TO THE
CONVENTION ON BIOLOGICAL DIVERSITY
Fifteenth meeting - Part II
Montreal, Canada, 7-19 December 2022

DRAFT DECISIONS FOR THE FIFTEENTH MEETING OF THE CONFERENCE OF THE
PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY



Convention on
Biological Diversity

BIODIVERSITY CONVENTION | CARTAGENA PROTI



5 DECEMBER 2020

World Soil Day

Keep soil alive,
protect soil biodiversity



Preparations for the Post-2020 Biodiversity Framework

During the fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity will adopt a post-2020 global biodiversity framework as a stepping stone towards the 2050 Vision of

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Convention on
Biological Diversity

Plan of Action 2020-2030 International Initiative for the Conservation and Sustainable Use of Soil Biodiversity

2020 UN BIODIVERSITY CONFERENCE
COP 15 - CP/MOP10 - NP/MOP4
Ecological Civilization-Building a Shared Future for All Life on Earth
KUNMING, CHINA

Invites FAO and GSP to facilitate
its implementation



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GLOBAL SOIL
PARTNERSHIP

INTERNATIONAL NETWORK ON SOIL BIODIVERSITY
NET SOB



Support countries
in producing soil
biodiversity
information



GLOSOB
GLOBAL SOIL BIODIVERSITY OBSERVATORY

Facilitate
GLOSOB

GLOSOLAN
GLOBAL SOIL LABORATORY NETWORK

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Composed of
many partners

earth
microbiome project

Soil BON

GLOBAL SOIL BIODIVERSITY INITIATIVE

EU SOIL OBSERVATORY

RED LIST

GBIF
Global Biodiversity Information Facility

The Global Fungal Red List Initiative

Global Initiative of Crop Microbiome and Sustainable Agriculture



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How?

Country-driven
(decentralized)

Establishment
of National Soil
Information and
Monitoring Systems
(including soil
biodiversity)

Identify and monitor
soil biodiversity
hotspots (in
managed lands and
natural ecosystems)

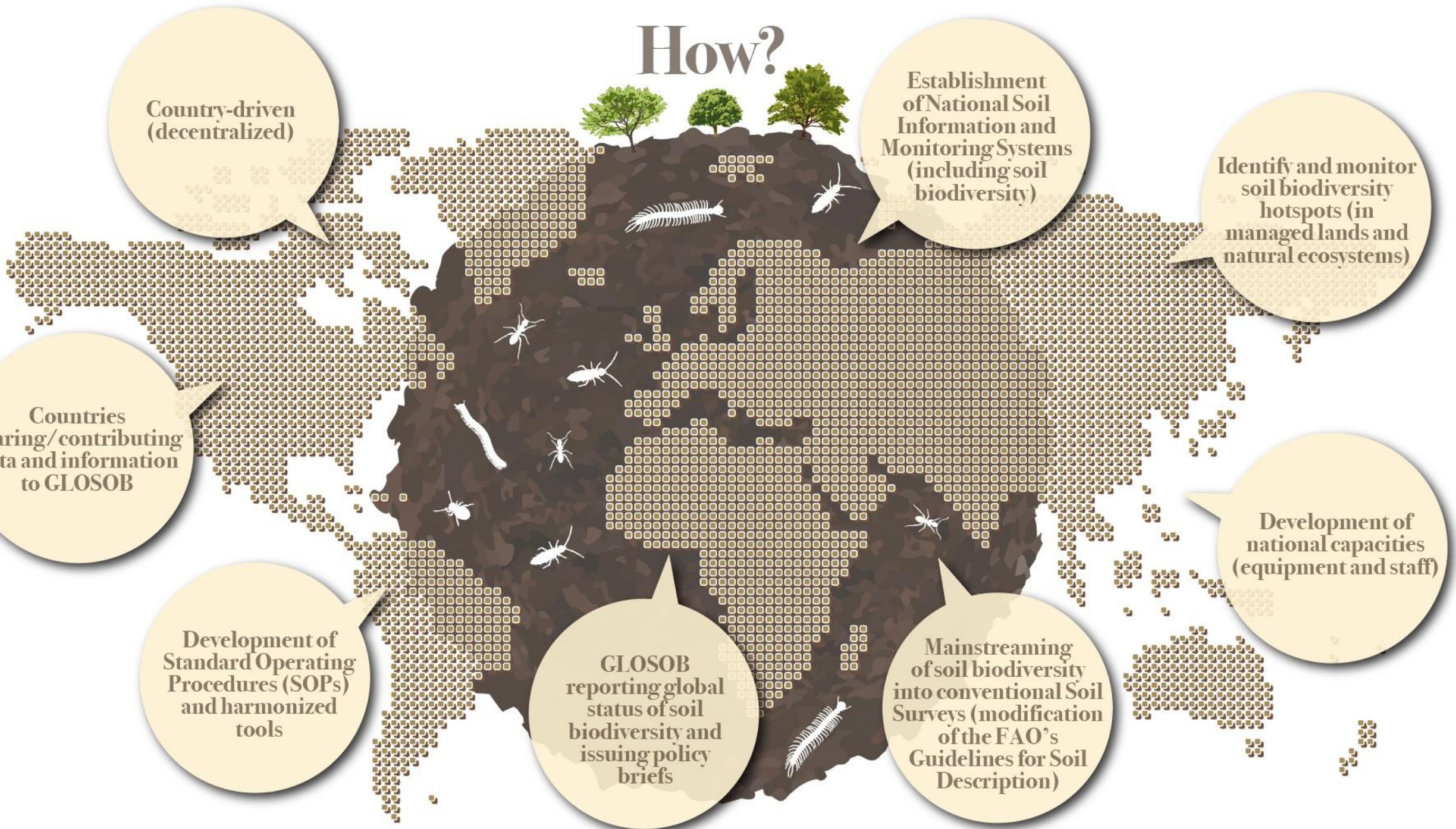
Countries
sharing/contributing
data and information
to GLOSOB

Development of
Standard Operating
Procedures (SOPs)
and harmonized
tools

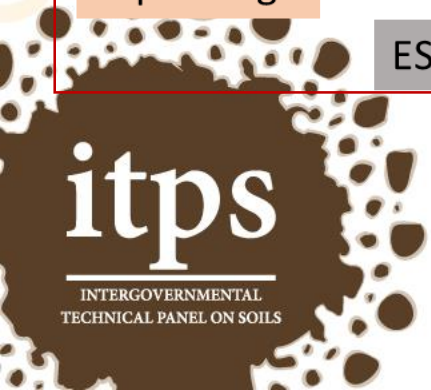
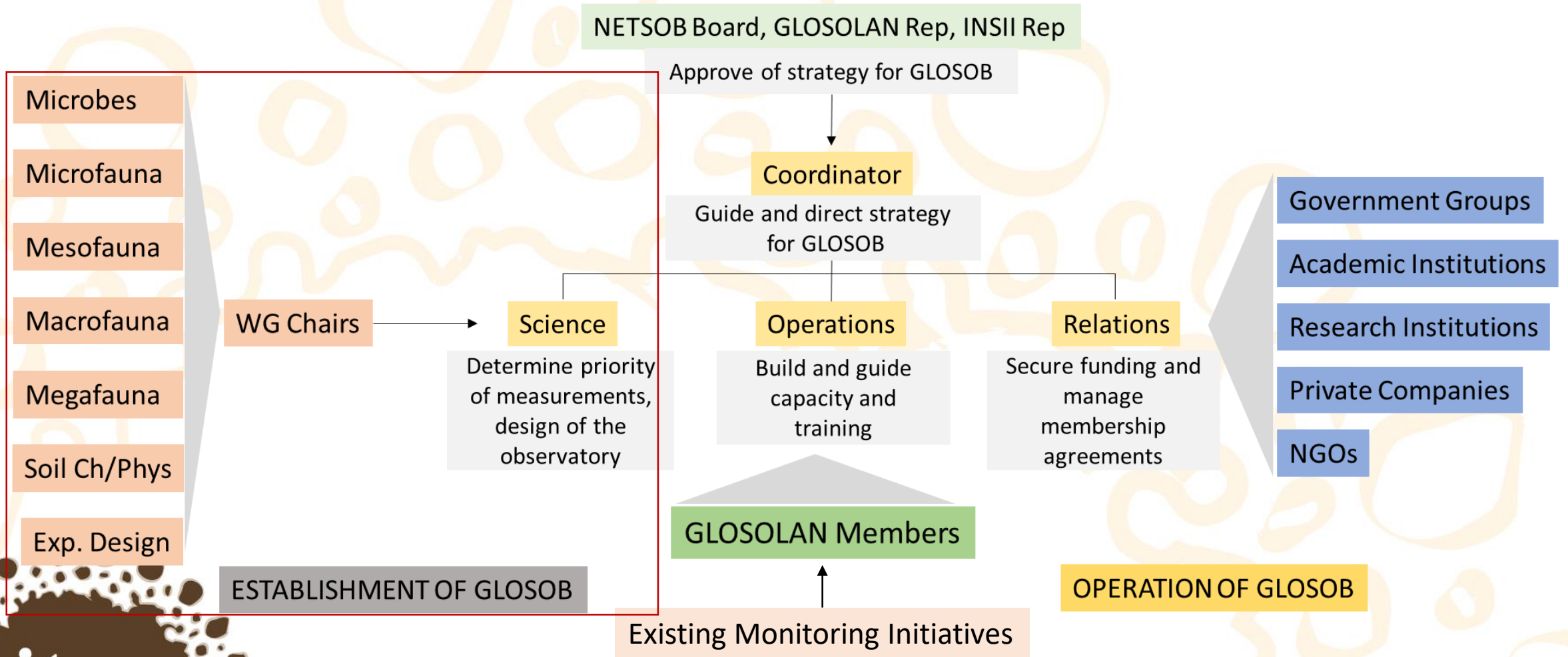
GLOSOB
reporting global
status of soil
biodiversity and
issuing policy
briefs

Mainstreaming
of soil biodiversity
into conventional Soil
Surveys (modification
of the FAO's
Guidelines for Soil
Description)

Development of
national capacities
(equipment and staff)



Organization of GLOSOB

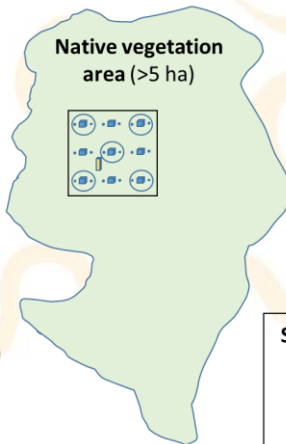
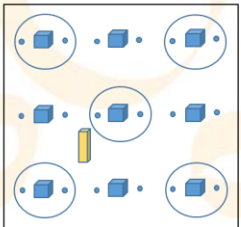


	Basic Membership	Moderate Membership	Advanced Membership
Microbes	16S rRNA (bacteria), ITS amplicon (fungi)		Deep sequencing
Microfauna	Wet extraction of nematodes	18S amplicon	
Mesofauna	Dry extraction & QBSar		COI barcoding of selected taxa, wet extraction (Enchytraeidae)
Macrofauna	Handsorting (ISO-TSBF)		COI barcoding of selected taxa
Megafauna		Traps	Acoustic, e-DNA
Physical attributes	Soil particle size fractions, bulk density	Visual assessment of soil structure, aggregation	
Biogeochemistry	Respiration, biomass, pH, organic C content, CEC, Tea-bag decomposition, P availability	Total C and N, N mineralization, X-ray diffraction, enzymatic activity	Litter-bags (of different sizes)
Environmental	Soil profile description, GPS of all sampling points, description of land use/cover and management practices	Idem	Idem
Experimental design	Measurements in one site (preferably biodiversity hotspot) with different management systems and native vegetation	Measurements in replicated managed areas and native vegetation in several sites	Measurements in all soil surveys

Establishment of GLOSOB

Sampling design for the GLOSOB monitoring system

Anthropogenic system (forestry or agroecosystem >1ha)



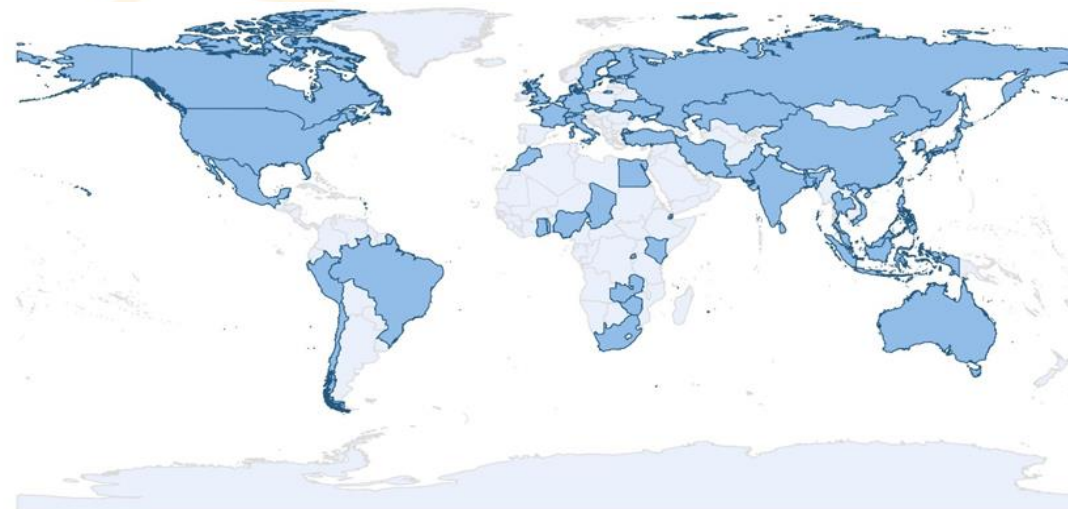
Minimum soil variables to monitor

- Macrofauna (n=9)
- Mesofauna (n=9)
- Microfauna (n=5)
- Metabarcoding (n=5)
- Tea-bags (n=5)
- Enzymes (n=5)
- Chemistry (n=5)
- Bulk density (n=9)
- Aggregation (n=5)
- Particle size (n=5)

Sites for monitoring replicated three times

- Native vegetation
- Low-impact anthropogenic system
- Moderate-impact anthropogenic system
- High-impact anthropogenic system

- Monolith for macrofauna (TSBF)
- Soil cores for mesofauna (QBSAr) and bulk density
- Area around monolith for composite & other soil samples
- ▮ Soil profile pit (description)



Tier 1: Basic Capacity

Countries with no monitoring programs at present, and with little to no capacity and/or infrastructure to perform monitoring of minimum soil biodiversity variables

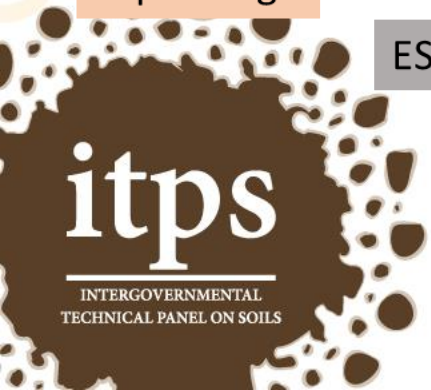
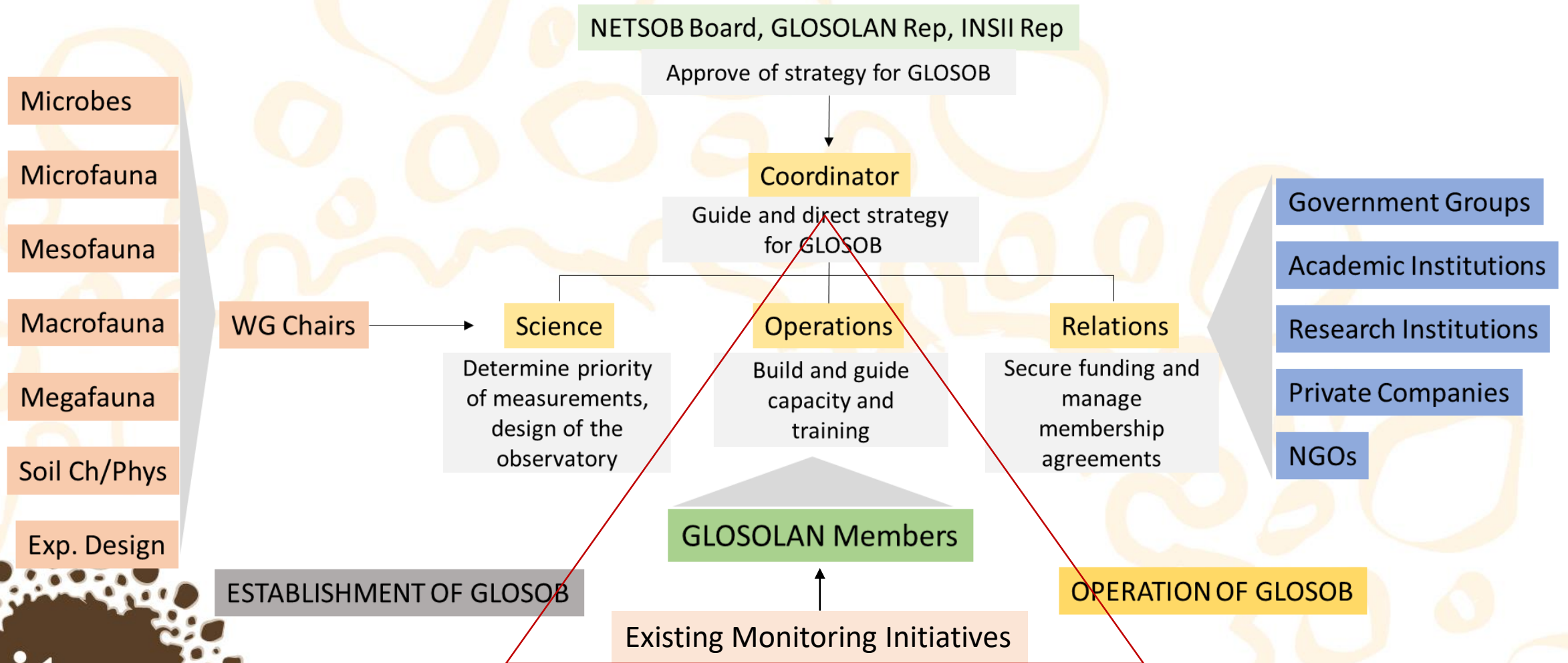
Tier 2: Moderate Capacity

Countries with ongoing monitoring programs but don't include minimum variables, or with history of capacity to measure minimum variables in last 10 years.

Tier 3: Advanced Capacity

Countries with ongoing monitoring programs including soil biodiversity variables, and commitment to include variables in soil surveys

Organization of GLOSOB



Implementation of GLOSOB

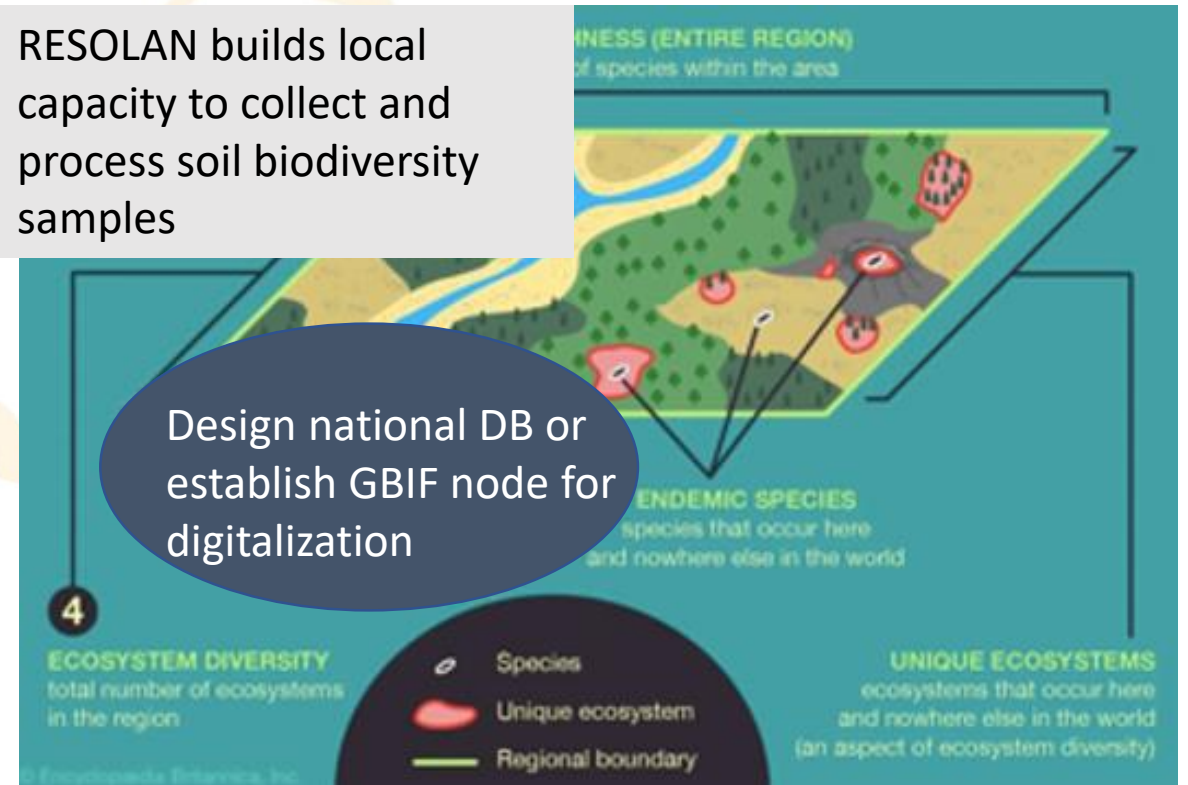
Host government or funding agency agrees to join GLOSOB

GLOSOB, NETSOB, ITPS, and GLOSOLAN members determine capacity and data collection locations.

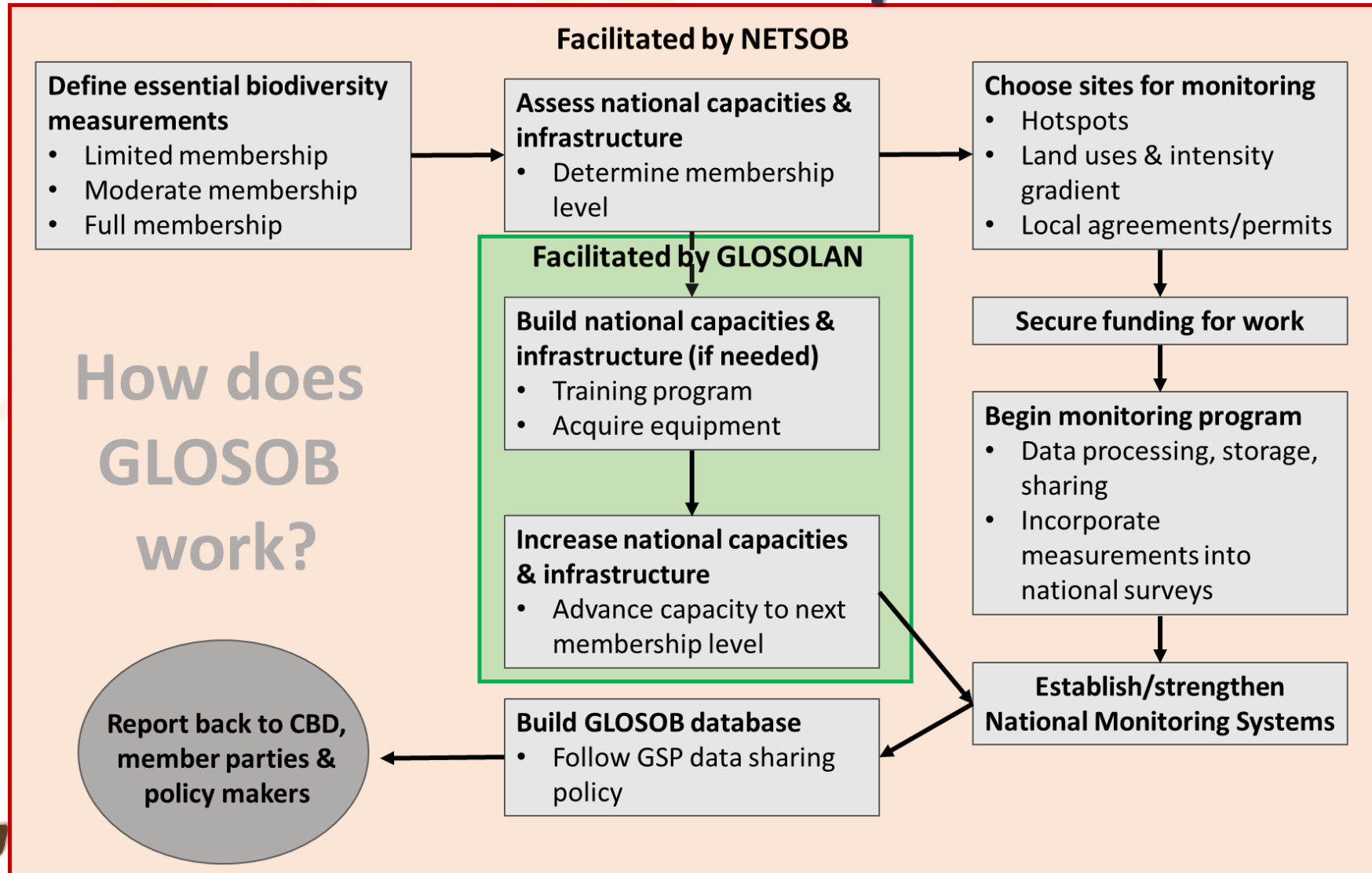
RESOLAN builds local capacity to collect and process soil biodiversity samples

Established initiative adopts GLOSOB SOPs and/or locations

Design national DB or establish GBIF node for digitalization



GLOSOB Workplan



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Thank you!

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