



Food and Agriculture
Organization of the
United Nations

Global Soil Biodiversity Observatory: objectives, scope, governance, and work plan

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Status of soil biodiversity information

GUIDELINES FOR SOIL DESCRIPTION



- Soil biodiversity not fully covered in Soil Surveys.
- Very few countries perform soil biodiversity survey, isolated from conventional soil surveys (research).
- Some global and regional initiatives: SoilBon, EUSO-LUCAS.
- Taxonomic insufficiency & lack of data from many countries.
- Few soil-dwelling species have been evaluated.
- Soil biodiversity cannot be expressed by one single measurement/indicator.

Soil BON



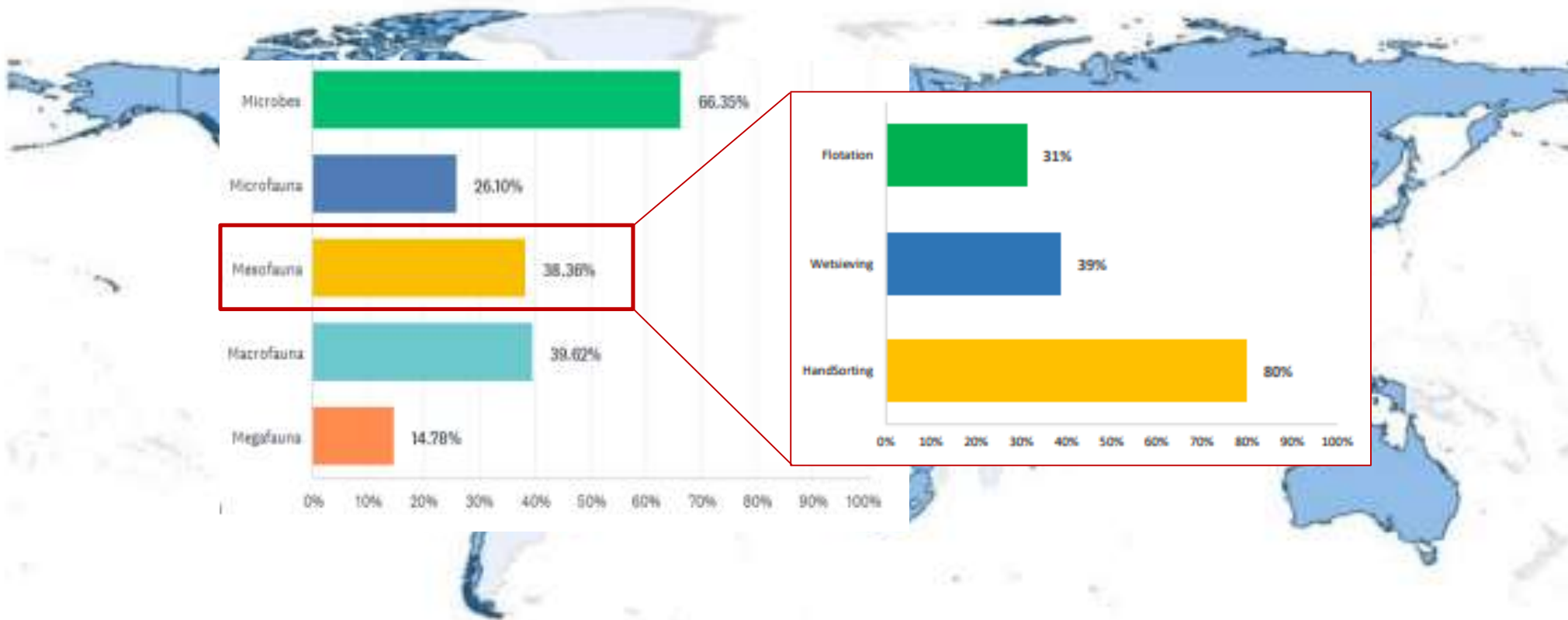
EU Soil Observatory: Key Objectives



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Status of soil biodiversity information



Countries highlighted in blue have a current national 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



GLOBAL SOIL PARTNERSHIP



CBD



Convention on Biological Diversity

Distr. GENERAL
 CBD/COP/15/2
 15 October 2022*
 ORIGINAL: ENGLISH

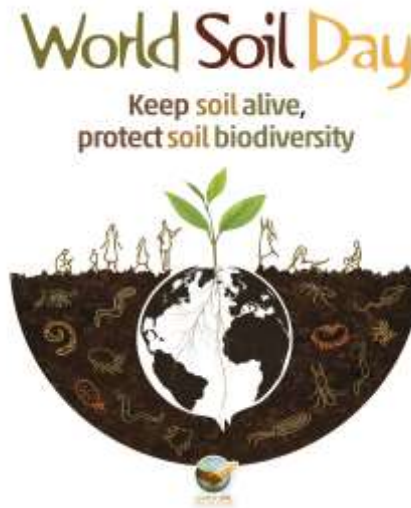
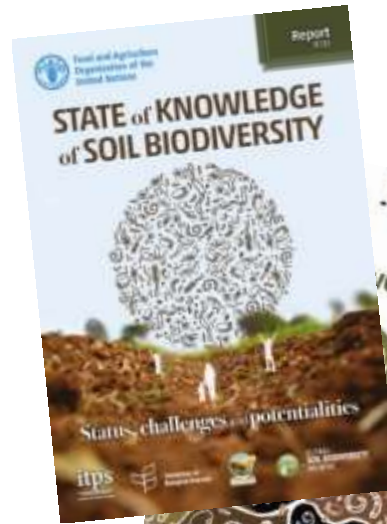
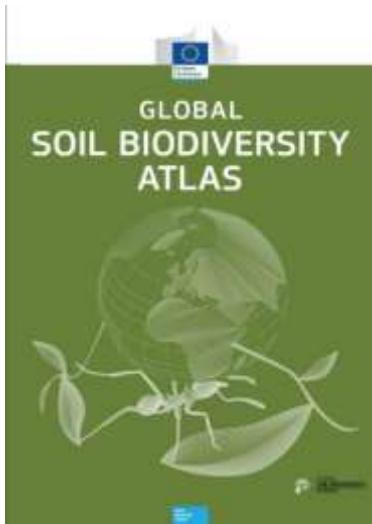
Soil BON



5 DECEMBER 2020



BIODIVERSITY CONVENTION CARTAGENA PROTI



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





Convention on
Biological Diversity

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

Invites FAO and GSP to facilitate its implementation



 Food and Agriculture Organization of the United Nations

 GLOBAL SOIL PARTNERSHIP

 earth microbiome project

 Soil BON

 GLOBAL SOIL BIODIVERSITY INITIATIVE

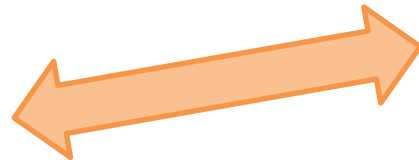
 EU SOIL OBSERVATORY

 RED LIST

 GBIF Global Biodiversity Information Facility

 The Global Fungal Red List Initiative

 Global Initiative of Crop Microbiome and Sustainable Agriculture



Composed of many partners



Facilitates GLOSOB



Support countries in producing soil biodiversity information



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GOAL

Monitor and forecast the condition of global soil biodiversity and how human activities' impact its role in providing ecosystem services.

WHAT

GLOSOB will strengthen national capacities of:

- **Laboratories:** use of state-of-the-art methods and tools to measure soil biodiversity according to standard operating procedures (SOPs).
- **National experts:** interpretation of soil biodiversity data and information.
- **Institutions:** measure, map and monitor soil biodiversity
- **Land users:** sustainable use, and management and conservation of soil biodiversity for sustainable and resilient agriculture, bioremediation, and ecosystem restoration
- **Policy makers:** performing evidence-based decision-making.

HOW

Countries will be responsible for measuring, monitoring, and sharing soil biodiversity information of hotspots according to NETSOB's harmonised methodologies/protocols and country capacities (3 tiers).



GLOBAL SOIL BIODIVERSITY OBSERVATORY

MISSION

Serve as the Observatory providing with global soil biodiversity data and information for guiding evidence-based decision-making.

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)

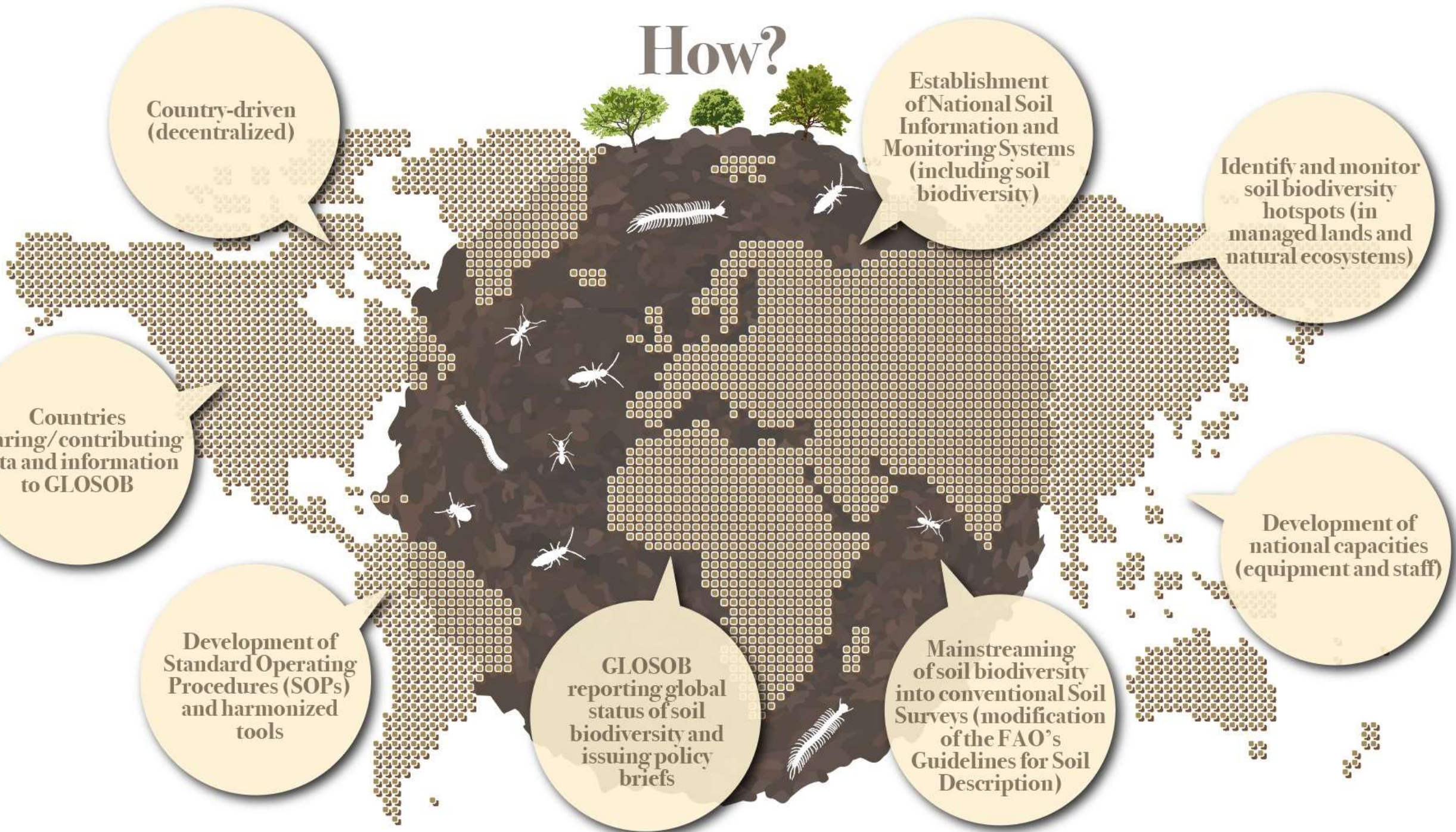
Development of
national capacities
(equipment and staff)

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

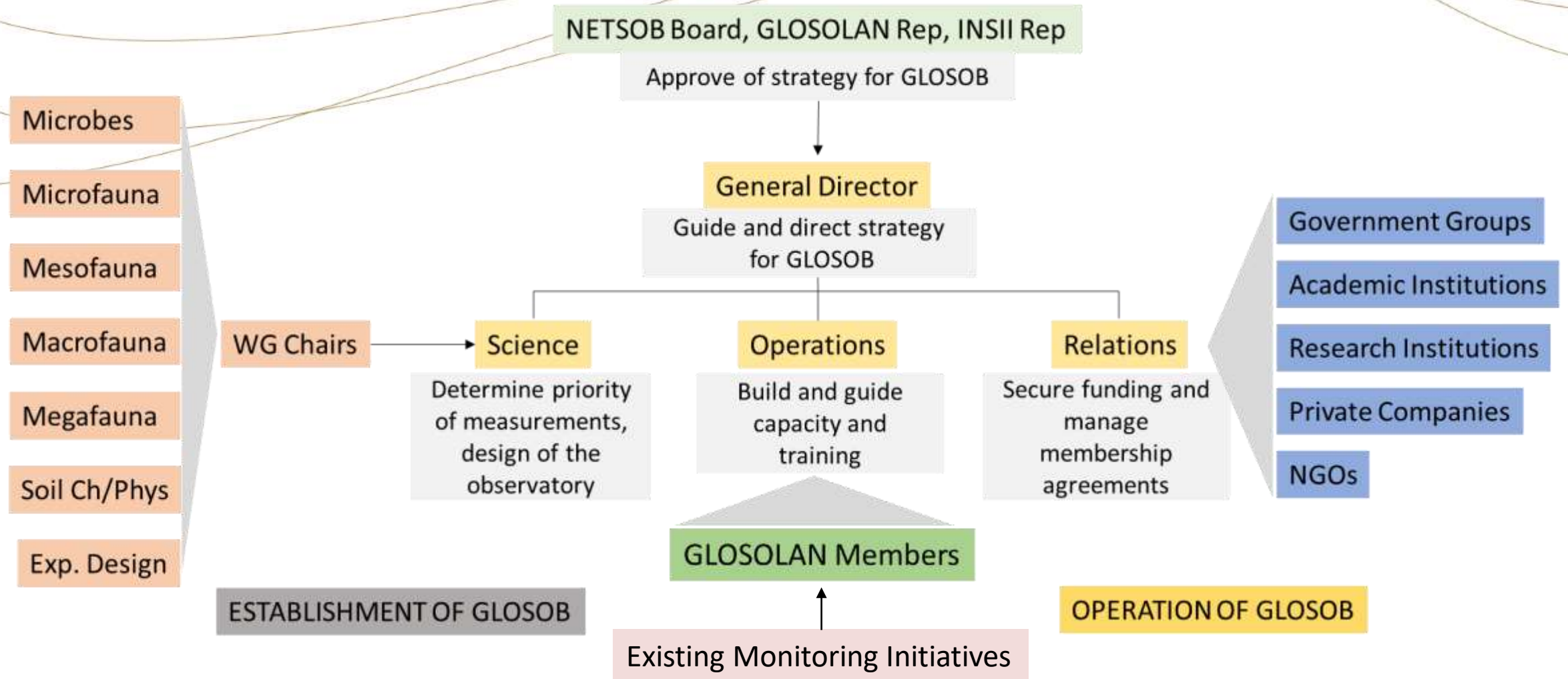
GLOSOB
reporting global
status of soil
biodiversity and
issuing policy
briefs

Development of
Standard Operating
Procedures (SOPs)
and harmonized
tools

Countries
sharing/contributing
data and information
to GLOSOB



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Essential Biodiversity Measurements

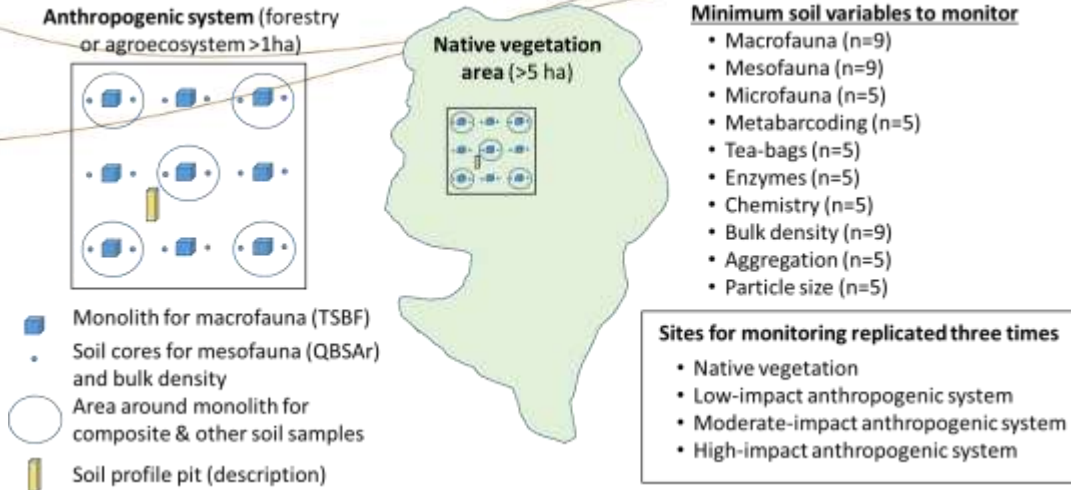
	Basic Membership	Moderate Membership	Advanced Membership
Microbes	16S rRNA (bacteria), ITS amplicon (fungi)		Deep sequencing
Microfauna	Wet extraction of nematodes	18S amplicon	
Mesofauna	Dry extraction & QBSar		COI barcoding of selected taxa, wet extraction (Enchytraeidae)
Macrofauna	Handsorting (ISO-TSBF)		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

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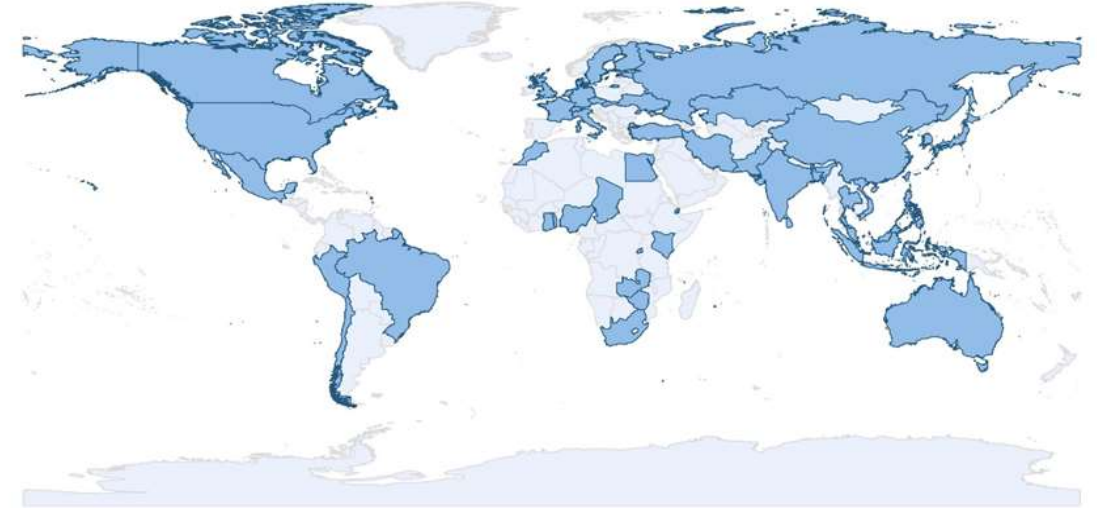


Implementation of GLOSOB

Sampling design for the GLOSOB monitoring system



Countries that reported soil biodiversity monitoring programs

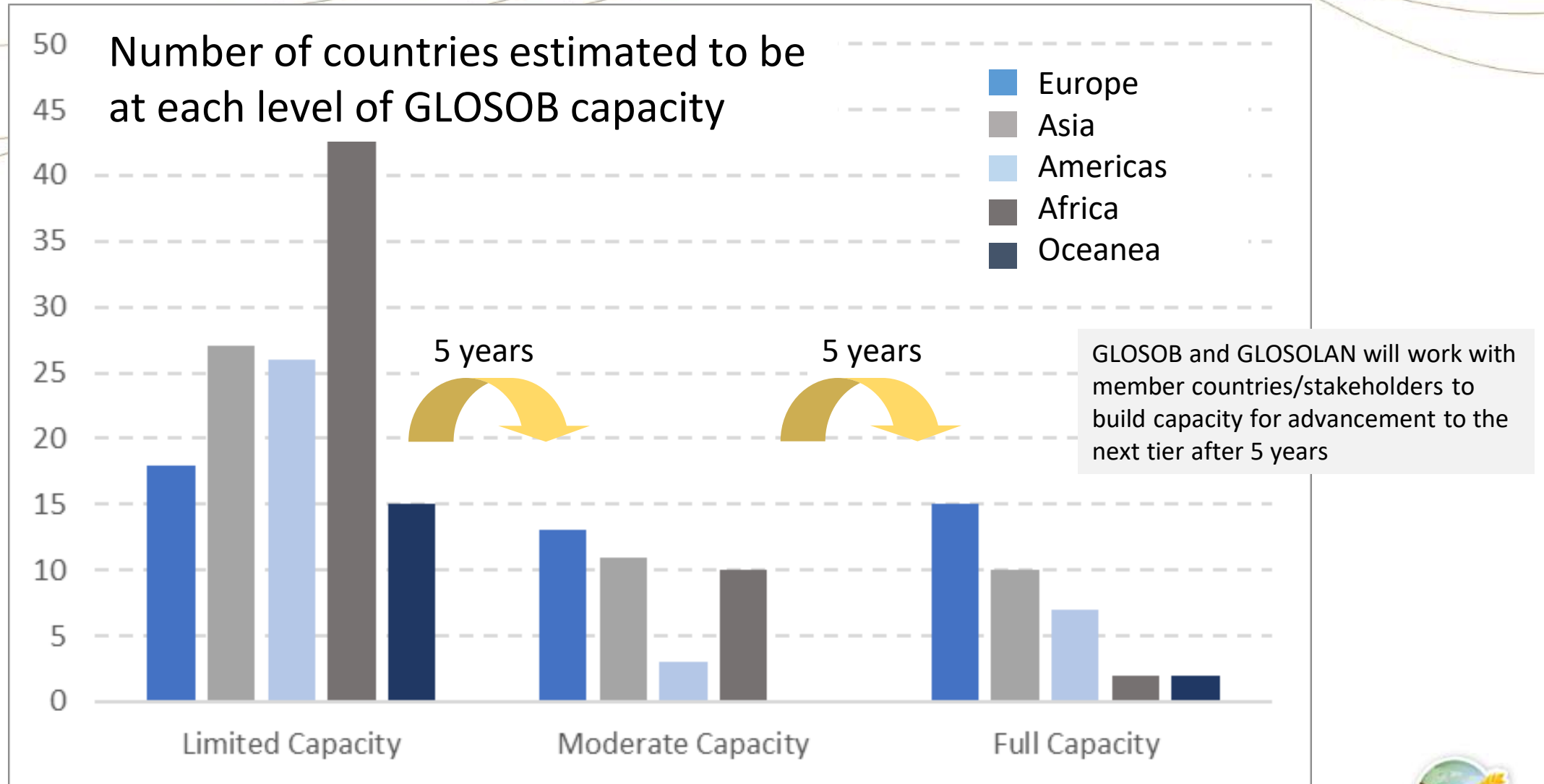


Tier 1: Limited Capacity	Tier 2: Moderate Capacity	Tier 3: Full Capacity
Countries with no monitoring programs at present, and with little to no capacity and/or infrastructure to perform monitoring of minimum soil biodiversity variables	Countries with ongoing monitoring programs but don't include minimum variables, or with history of capacity to measure minimum variables in last 10 years.	Countries with ongoing monitoring programs including soil biodiversity variables, and commitment to include variables in soil surveys

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GLOSOB Workplan: Build Capacity

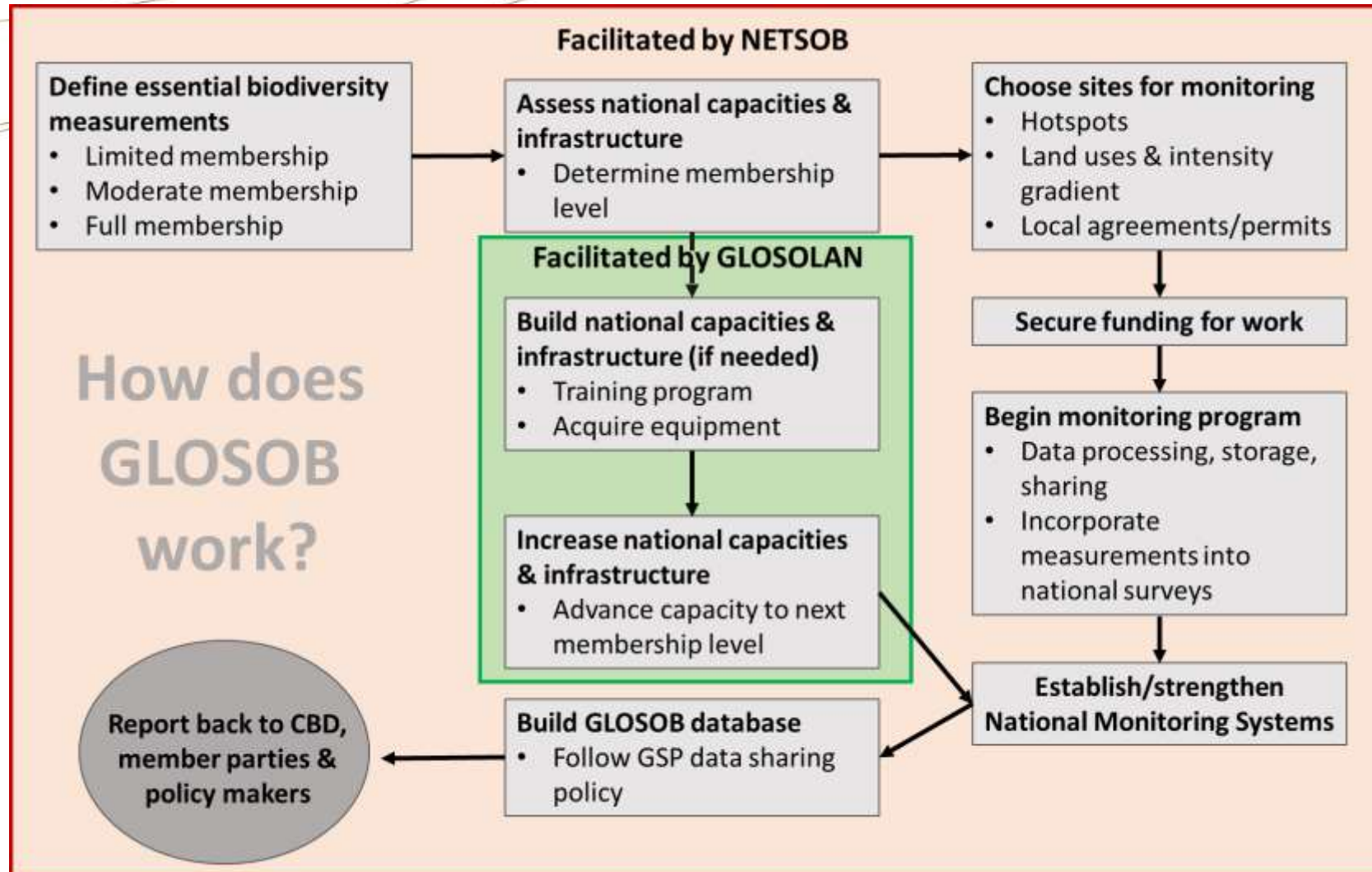


SOURCE: Brown et al., in prep. Global Survey on Soil Biodiversity

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GLOSOB Workplan



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