



Food and Agriculture
Organization of the
United Nations

Launch of the
**International Network
on Soil Biodiversity**

in the framework of the
Global Soil Biodiversity Observatory

3rd December 2021 | 🕒 14:00 CET
Online meeting

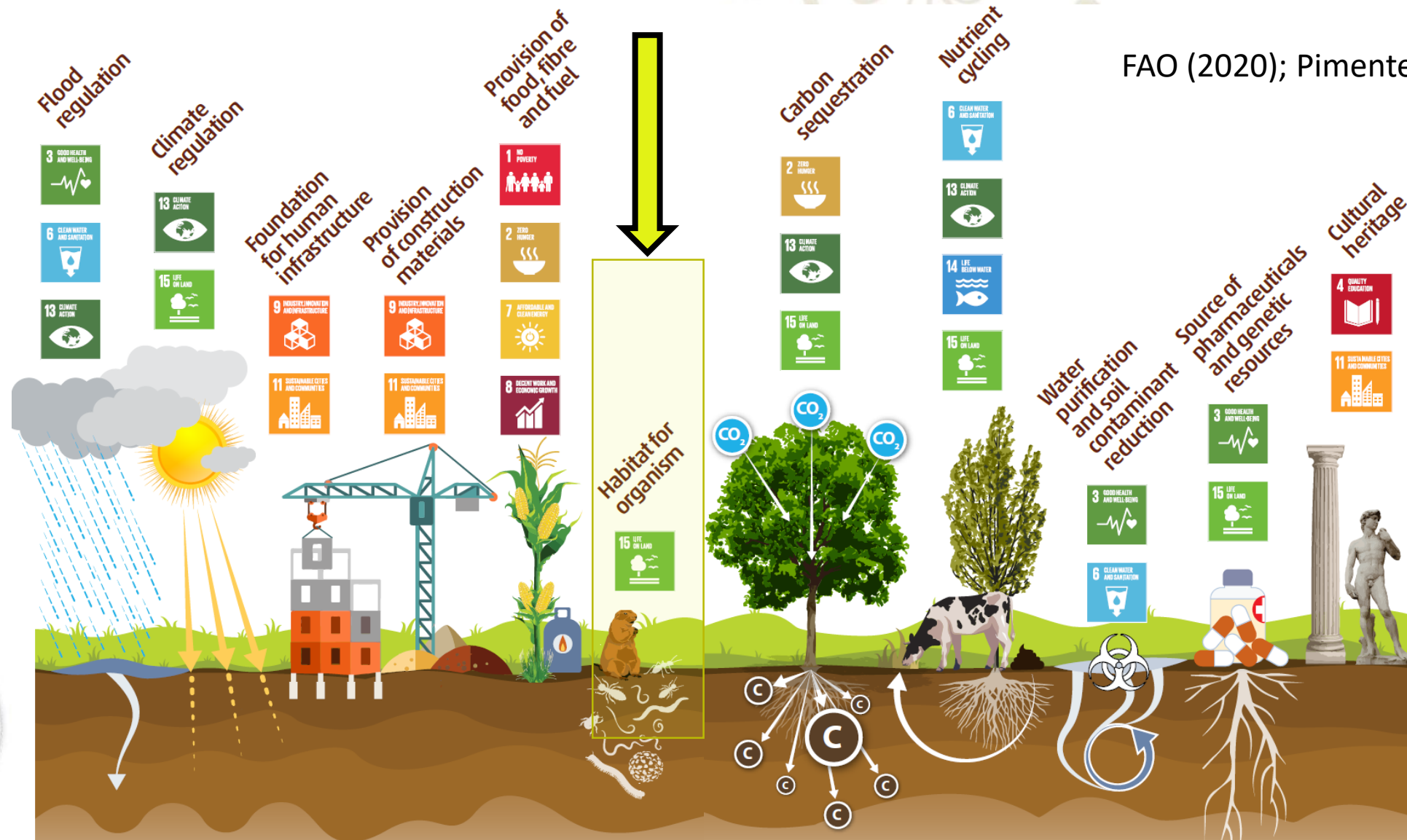
Towards a Global Soil Biodiversity Observatory (GLOSOB)

George Brown (Embrapa Forestry)
Rosa Corona Cuevas (FAO)



Why do we need a GLOSOB?

Soils are essential for ecosystem service delivery (valued at > €1 trillion /yr)



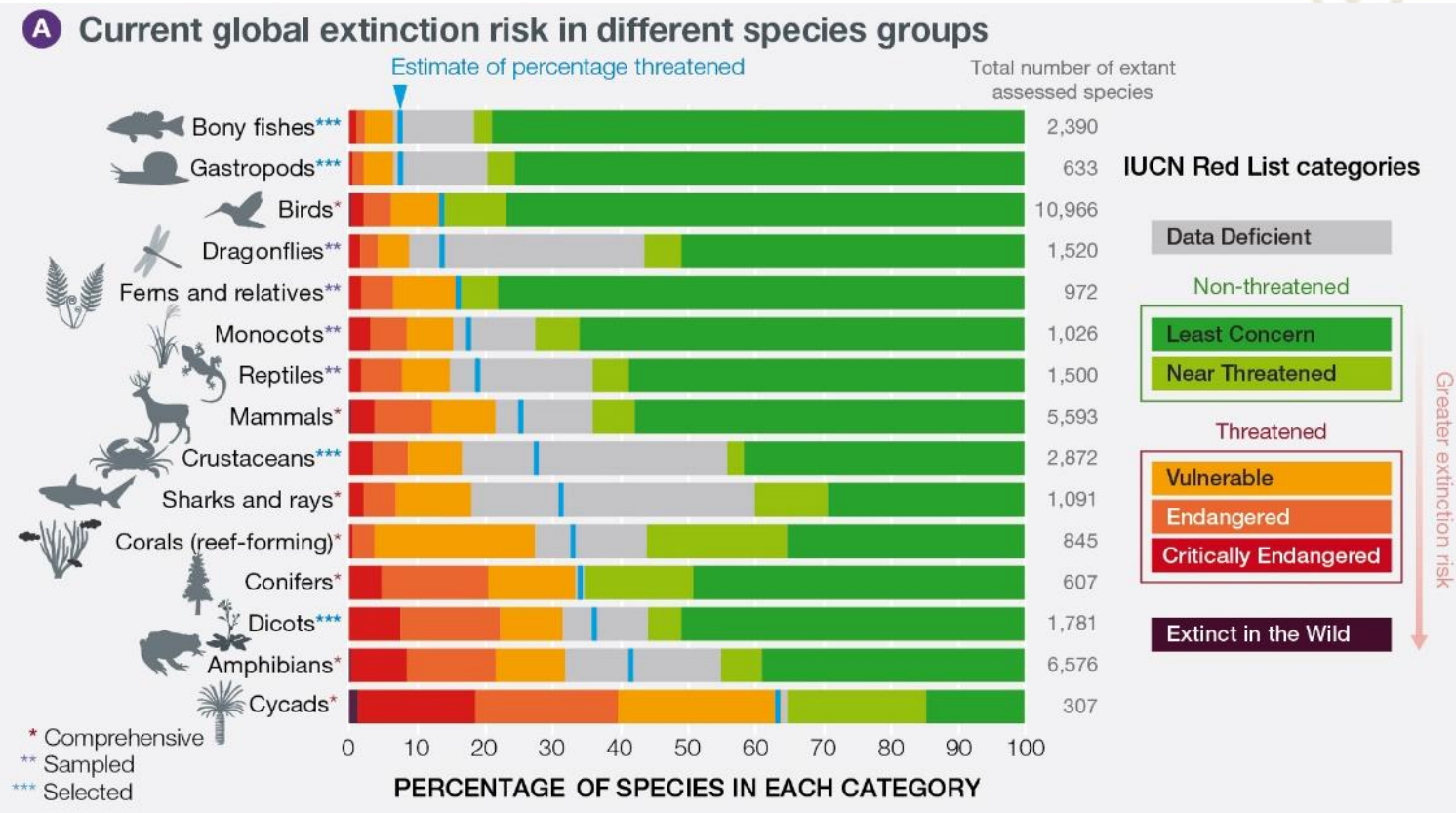
FAO (2020); Pimentel et al. (1997)



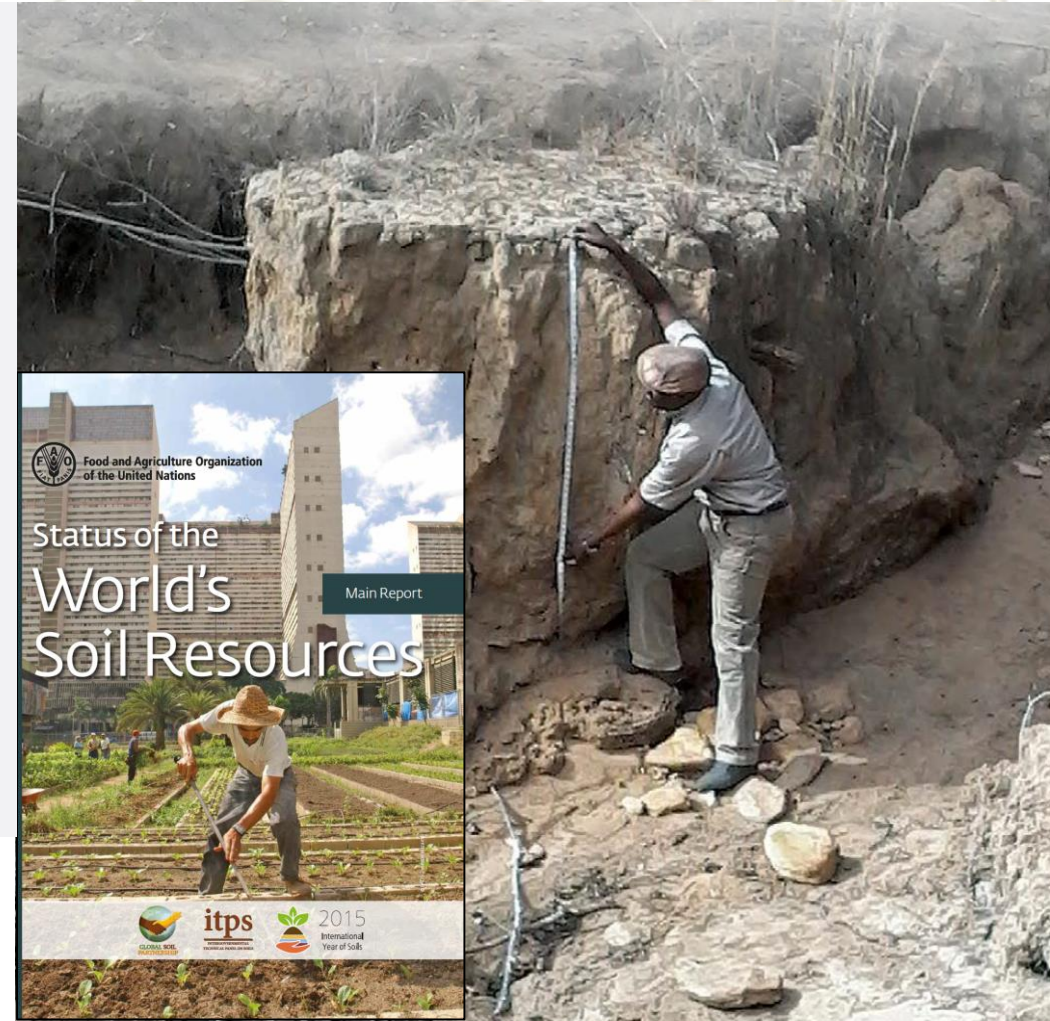
Why do we need a GLOSOB?

We are living a biodiversity crisis
(1 million sp. endangered)...

33% of world's soils degraded



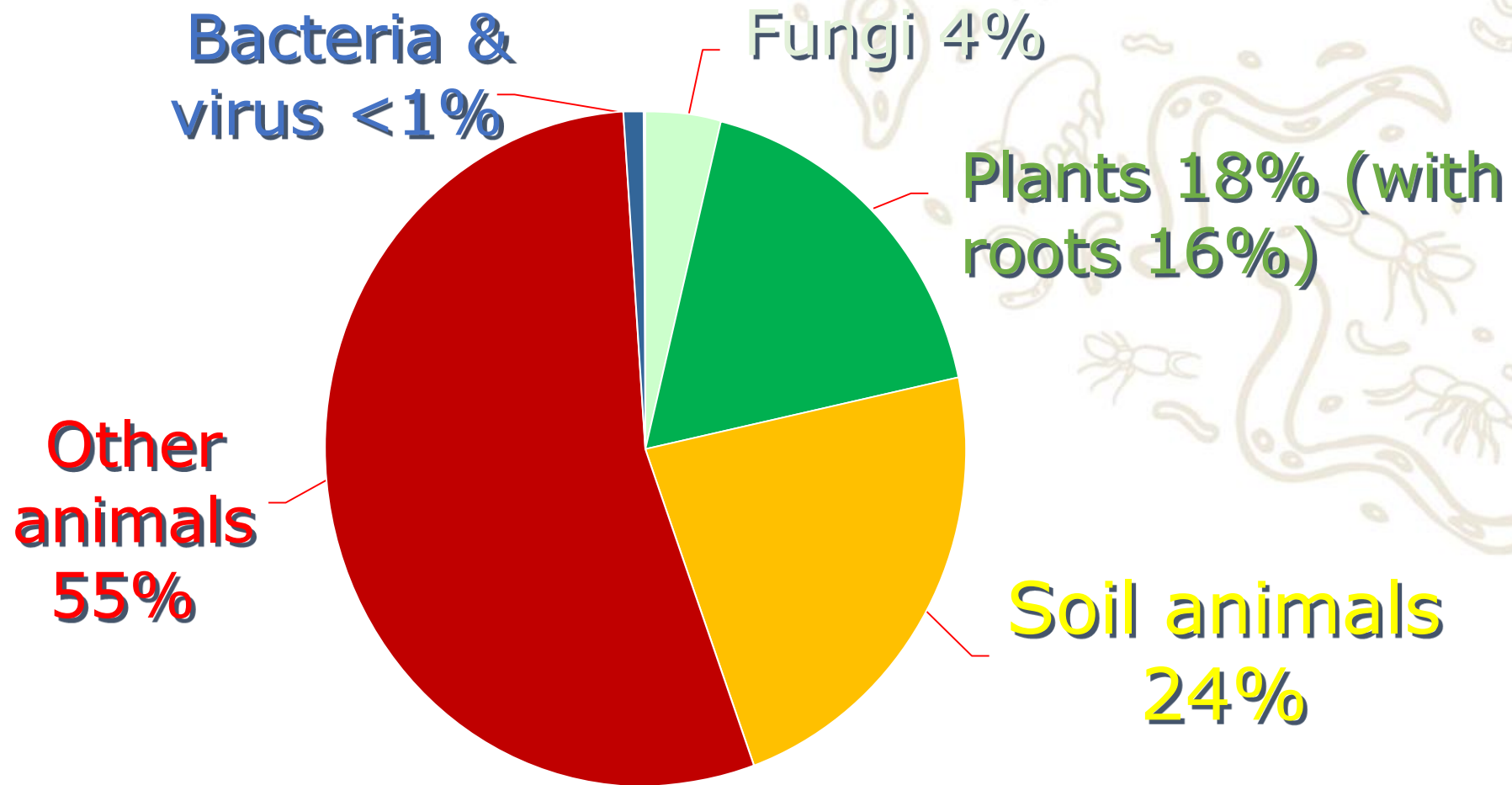
IPBES (2019); FAO (2015); Pimentel et al. (1997)



Why do we need a GLOSOB?

Decaëns et al. (2006)

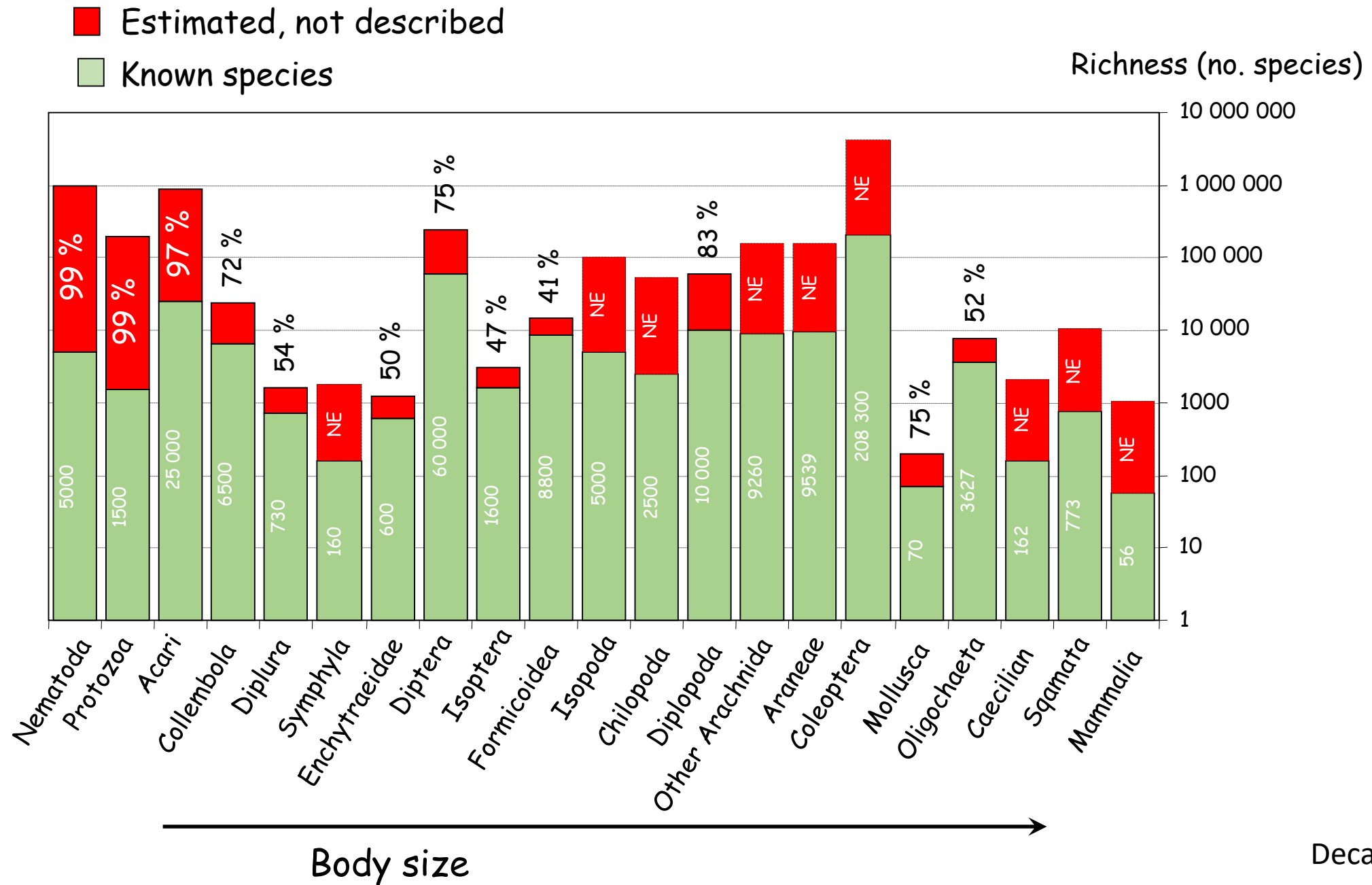
Soils hold >40% of earth's known biodiversity...



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But very poorly known!



Why do we need a GLOSOB?

- Taxonomy impediment in many countries and for many taxa
- Nowhere in the world has the full soil community been described...
- We can't manage or protect what we do not know!



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What do we mean with a GLOSOB?

1. Observe (by measuring) => know what's there

- strengthen current knowledge
- identify best practices

2. Facilitate observations => standard methods

- promote capacity

3. Map & forecast => know where we are going

- help monitor & predict trends
- promote best practices

3. Show value of biodiversity



4. Influence policy to manage & protect

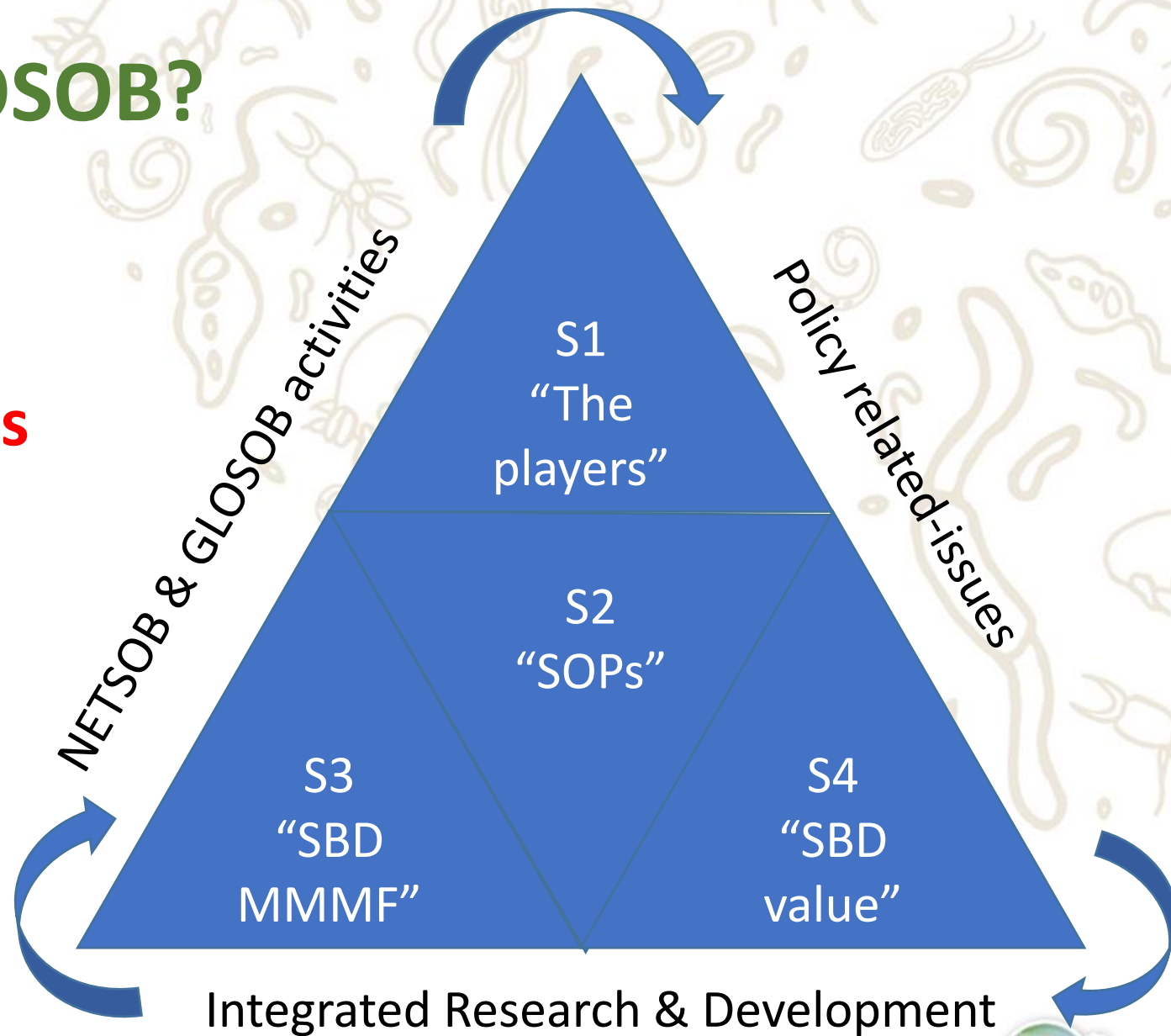


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How do we create a GLOSOB?

- Step 1: Map the players & choose the sites
- Step 2: Standardize methods
- Step 3: Measure & monitor
- Step 4: Reveal value of soil biodiversity
- Step 5: Subsidize policy development



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Step 1: Map main soil biodiversity players/stakeholders

Determine:

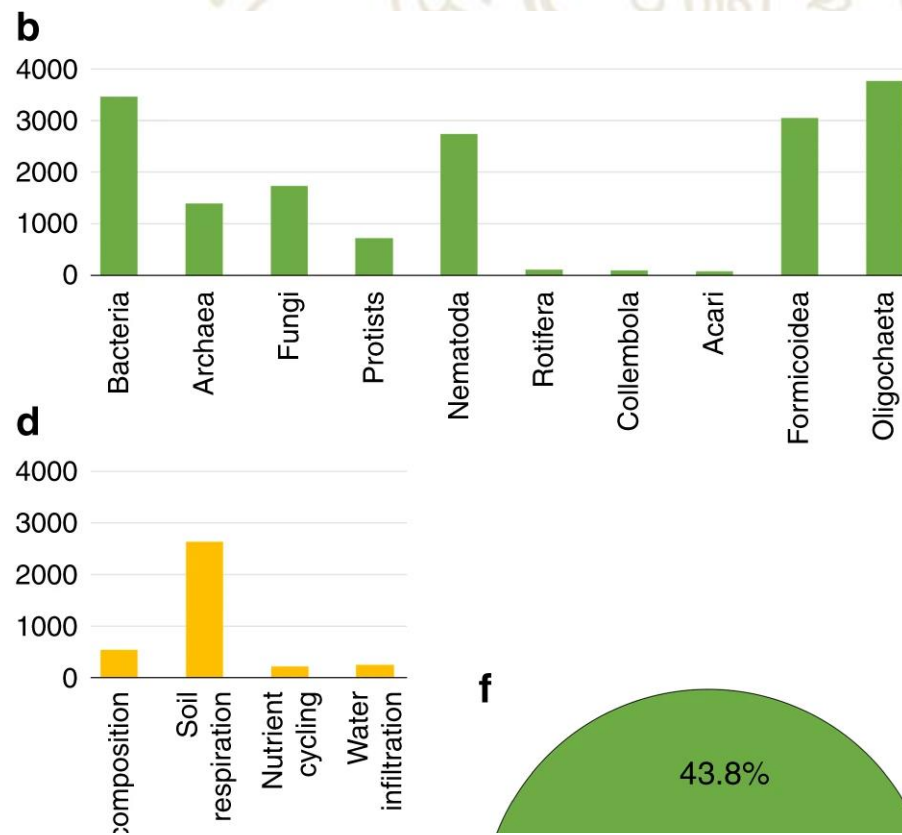
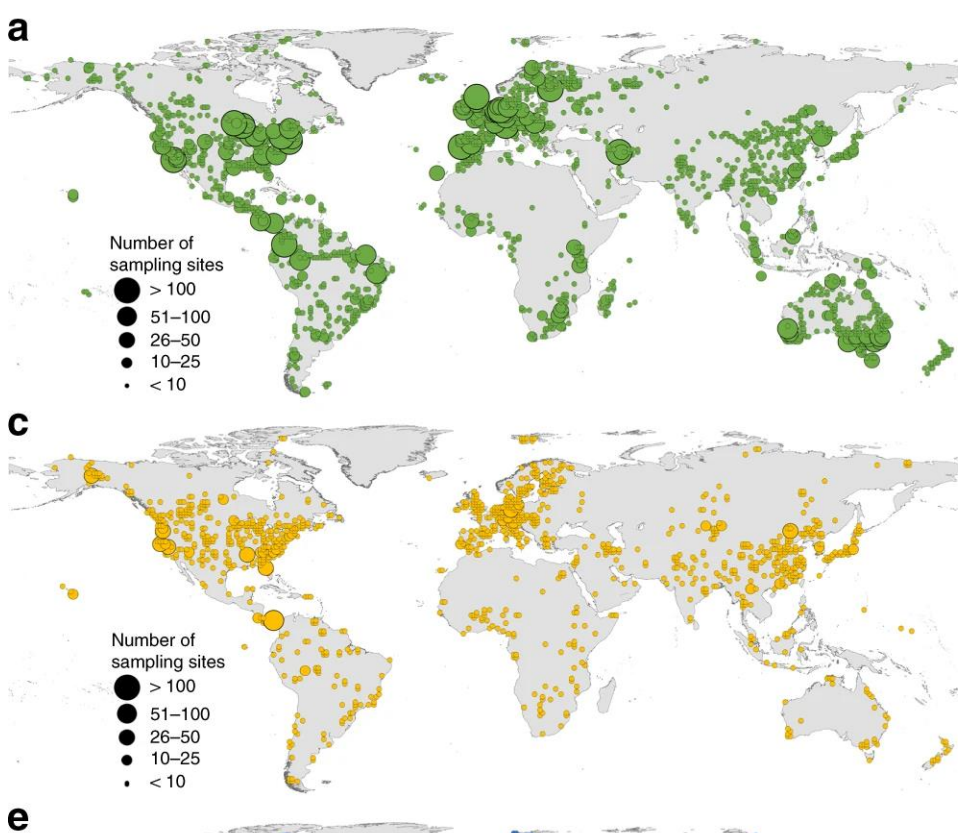
Who is doing what and where?

- **Institutions**
 - private/public, academic/research, NGO, civil society, etc.
- **Expertise and sectors**
 - sampling, analysis, mapping, management
- **Main topics and groups studied**
 - microbes, micro, meso, macrofauna
- **Level of work**
 - local/national/regional/global



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Guerra et al. (2020)

• What are the main gaps?

- Geographic
- Technical (methods)
- Taxonomic
- Financial resources
- Human resources

• Important decisions...

- => Where do we need to work
- => What and how to measure
- => What taxa do we include
- => Where to get funding
- => Who needs to be included/trained

How to find/involve stakeholders?

Stock-taking exercise (worldwide questionnaire):

- Type of institution
- Expertise and sector
- Main topics addressed
- Level of work

Literature/web review

Important input from NETSOB...



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Affiliations

Sort by: Results count Show: 100 Minimum record count: 1

Visualization: TreeMap Chart Number of results: 25



Search > Results > Results > Analyze Results > Results

654 results from Web of Science Core Collection for:

soil macrofauna (All Fields)

Refined By: Publication Years: 2022 or 2021 or 2020 or 2019 or 2018 or 2017 or 2016 or 2015 or 2014 or 2013 or 2012 X Clear all

Copy query link

Step 2: What do we need to measure and how?

No universal protocol available for determining soil biodiversity!

What can be done and where?

- Move beyond proxies => opt for real soil biodiversity data and measure proxies simultaneously
- Chose best indicators, metrics, methods & SOP's => measure, map, monitor & forecast soil biodiversity
- What are minimum, optimum and “heaven” scenarios => dependent on local conditions



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How to do this?

Stocktaking of indicators, metrics, methods/SOPs used

- Literature review: main methods used for various worldwide for soil biodiversity variables
- Work with GLOSOLAN
- Contributions from NETSOB & SoilBON (microbes and fauna), others...

Provide capacity building where needed

Funding to bring labs up to same technical standards

NETSOB WG1 input



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Activity 3: Measure, Map, Monitor & forecast soil biodiversity

Participatory process:

- Decide where to do the field work
- Decide where to do the lab work (some central labs?)
- Decide on how to report
- Decide on mapping/forecasting exercises

} NETSOB WG1 input

} GLOSOLAN input

} Outputs to GLOSIS

Use standard agreed-upon methods from Activity 2

Reveal LUS that best conserve soil biodiversity

Reveal LUS that are endangered

} Outputs to
NETSOB WGs
1 & 2



Activity 4: Reveal value of soil biodiversity

Nowhere in the world has the full value of soil biodiversity to ecosystem services been estimated!

- **Perform literature review**
- **Determine methods to calculate values**
 - => Substitution, willingness to pay
- **Use data generated in Activity 3**

NETSOB WG3
input



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Examples from Brazil...

- Biological N₂ fixation in soybeans
US\$ 15 billion/year
- Soybean Co-inoculation with *Azospirillum*:
R\$ 230.000 (2020)
- Maize inoculation with P-solubilizing *Bacillus subtilis*
and *B. megaterium*
R\$ 20 million (2020)



Activity 5: Subsidize policy development

Currently almost no national-level & international policies directed to soil biodiversity conservation & management!

Awareness raising:

- Soil biodiversity's economic value & critical role in providing ES
- Need for protection of soil biodiversity
- Need for sustainable use & management of soil biodiversity
- Need for soil biodiversity studies
- Need for financial mechanisms (research & rewards/compensation/PES)

NETSOB WG4
input

CBD Agenda 2030, Global Taxonomy Initiative

IBPES, UNFCCC & UNCCD reports, SDG goals

National Soil Programs/Reports

Glob functioning

Technical/scientific
branches of GLOSOB

GSBI/
SoilBON/
NETSOB

“Local
players”

National governments/Policies &
Programs, Research institutions,
Scientists, Farmers/field managers

Governance
of the
GLOSOB

FAO/
GLOSOLAN
ITPS-GSP

Glosob

Context for work via
International Initiative
for the Conservation
and Sustainable use of
Soil Biodiversity

CBD

Regional, National,
Institutional Soil
Information Systems

GLOSIS



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