

Theme 3. Soil Biodiversity shaping the future of food systems

ITPS

Ms Rosa Poch



Theme 3 aims to discuss legislation, policies, international frameworks and financial mechanisms to mainstreaming soil biodiversity across government and society, reducing the direct pressures and promoting sustainable use and improving the status of soil biodiversity through safeguarding ecosystems, genetic diversity and the functions and services provided by them.

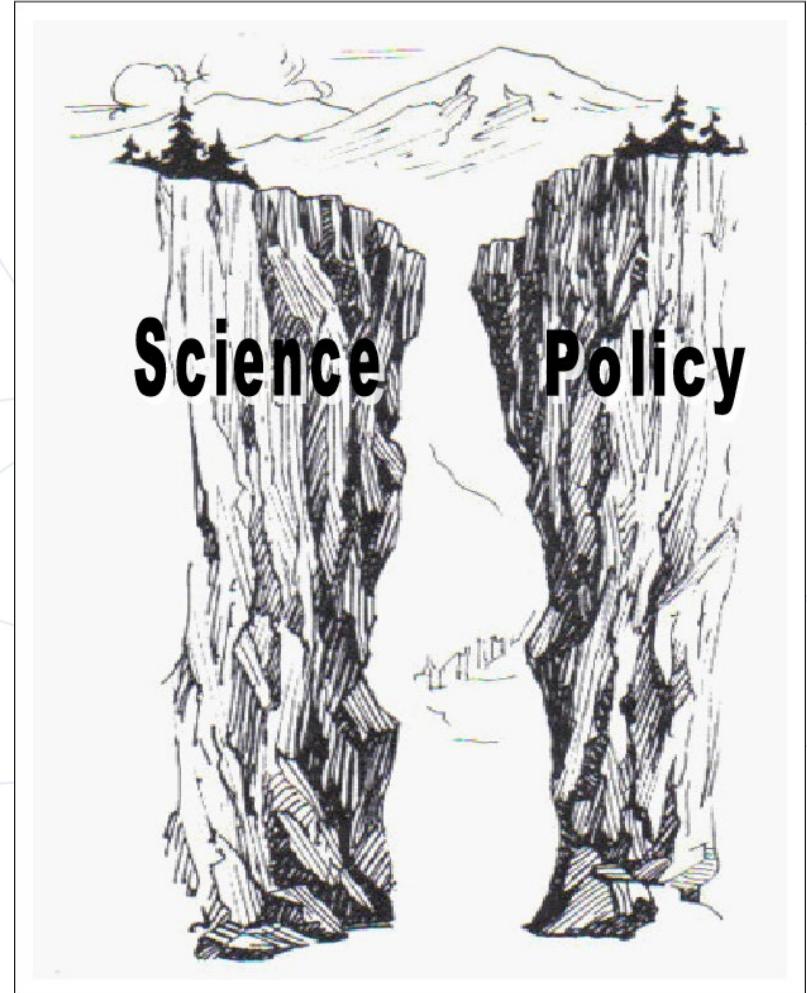


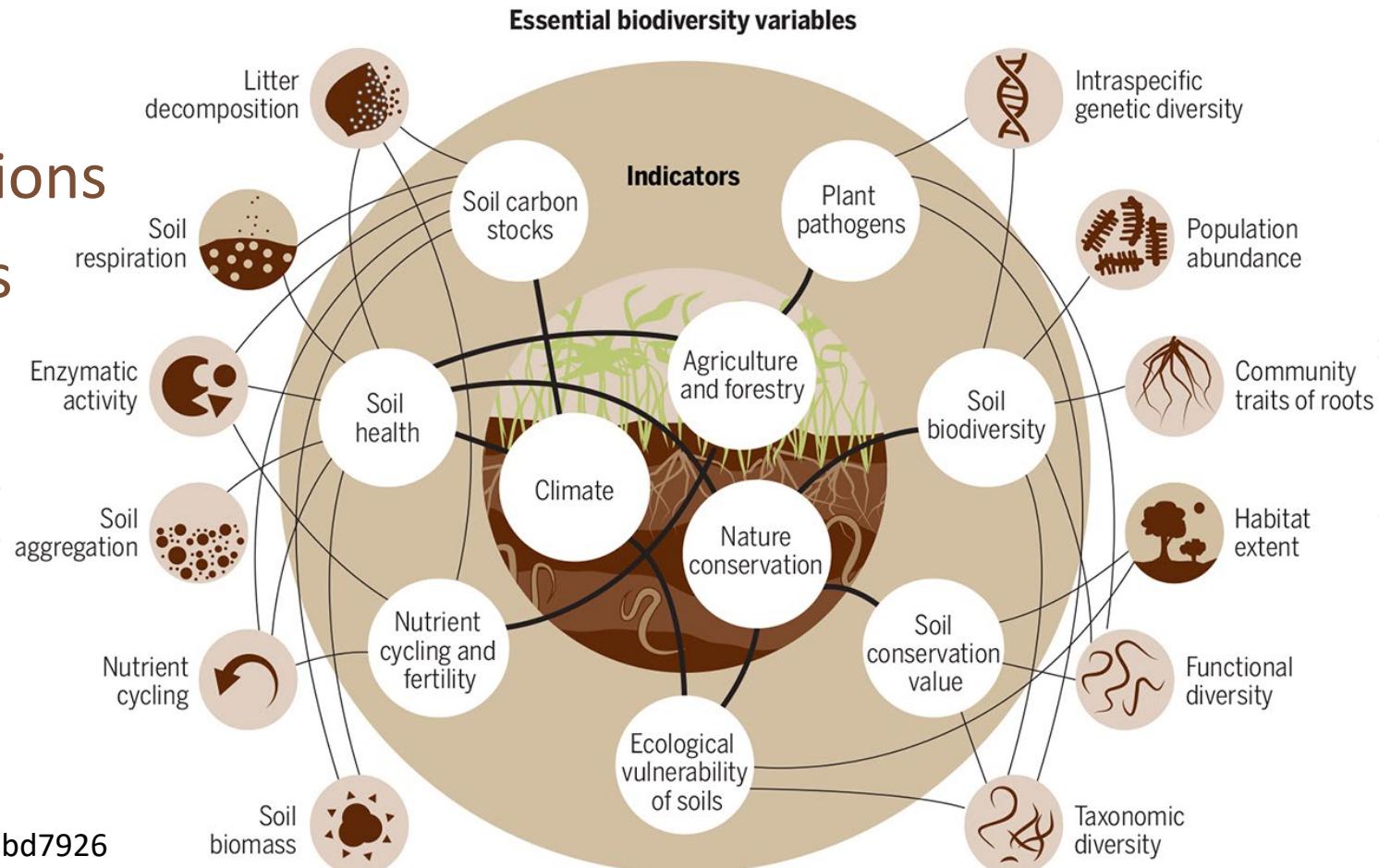
FIGURE 3
The science–policy chasm

Godfrey, Funke, Mbizvo, 2010

Theme 3

Soil Biodiversity shaping the future of food systems

- 31 Oral presentations
- 14 Posters

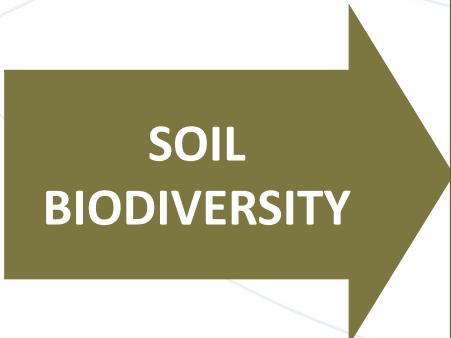


Guerra et al. 2021
10.1126/science.abd7926

Core questions:

1. What are the contributions of soil biodiversity to implement policies facing key sustainability challenges and to support countries to achieve the SDGs and other global commitments?





SOIL BIODIVERSITY

- Improve **soil fertility, nutrient uptake**: role of AMF, rhizobia, rich rhizosphere, N- fixation microorganisms in wood
- **Biofertilizers**: types, origins, performance, application, synergies
- Improve plant **resistance against water stress** (bacteria, fungi)
- Improve **growth in contaminated soils**
- Biological **pathogen control**: nematode management, Rhizobacteria
- **Biodegradation** of pesticides
- **Post-harvest quality**
- **Bioengineering – N fixation**



1. (cont.) What are the contributions of soil biodiversity to implement policies facing key sustainability challenges and to support countries to achieve the SDGs and other global commitments?



Biofertilization and organic fertilization; conservation agriculture; organic farming; agroforestry; intercropping; specific cultivars and soils; SSM in general



Pesticides; intensive agriculture; changing landuse to irrigation or from grasslands to crops. Soil biota has memory!

BUT... Need to know how the ecosystem works !



2. How to include soil biodiversity concerns into agricultural sectors and cross-sectoral mainstreaming approaches (such as land tenure, landscape management, ecosystem rehabilitation, food security and nutrition, small holders and family farmers, public health, forestry) ?

- ✓ Keynotes *Moët Hennessy, Phosagro, ACORN, Syncoculture*
- ✓ Improve **social awareness** on soil and soil biodiversity
- ✓ **Urban and peri-urban** agriculture
- ✓ **Demonstration plots**
- ✓ **Participatory work** to define indicators, testing areas, formulating policies
- ✓ **Use of existing policies**
- ✓ **Quality control** of biofertilizers



Biofertilizers in India (*Patra, Thajur & Mohanty*)

- The Indian Government has introduced schemes to scale up the use of biofertilizers: establishment of relevant networks, extension services and adoption of technologies (e.g automatic seed coating)
- Need of strengthening research, field demonstrations to visualize the impact of biofertilizers, focused research on improving shelf file of bioinoculants, mode of delivery, storage, quality control,.
- Government policy has to be in place to encourage the industrial participation.



Agro - environmental policy for the protection of soil biodiversity in Cuba. (Febles et al.)

SWOT analysis allowed to establish demonstration areas: “Soil, Water and Forest Conservation Polygons”

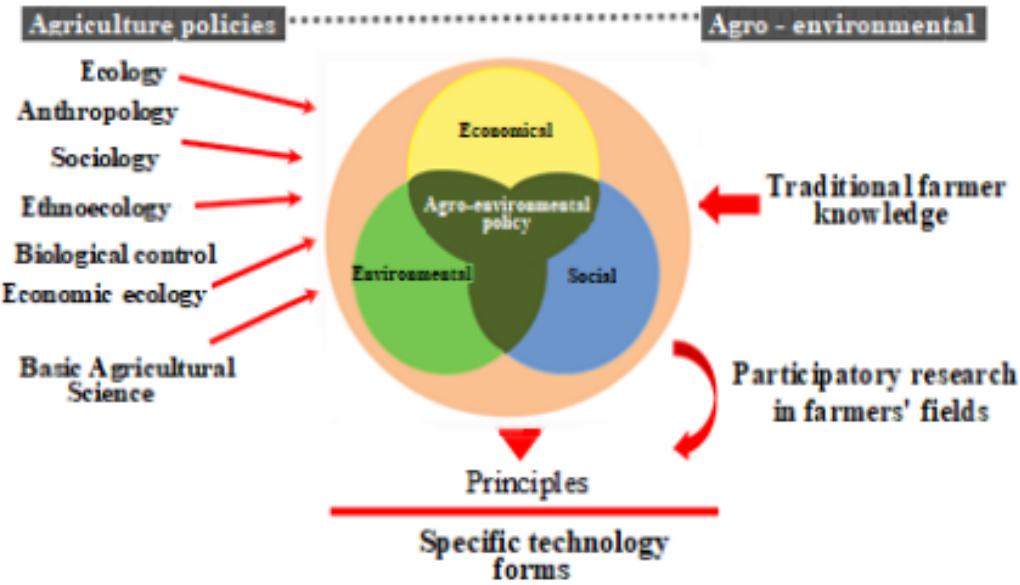


Fig.1. Dimensions of development and agro-environmental policy in Cuba

Urban and peri-urban gardening promotes urban and soil biodiversity. (Rossi, Aromolo, & Beni)

Potential to be a very effective method to valuate soil biodiversity, besides providing social, economic and environmental co-benefits and ecosystem services



QBS-ar in soil biodiversity monitoring: the experience of Emilia-Romagna Region. (Staffilani, Menta, Conti)

- Regional Monitoring Network funded by the CAP-EU
- Development of an indicator based on microarthropods
- Evaluation of organic, integrated, conservation agriculture, extensive grassland and traditional farming systems.



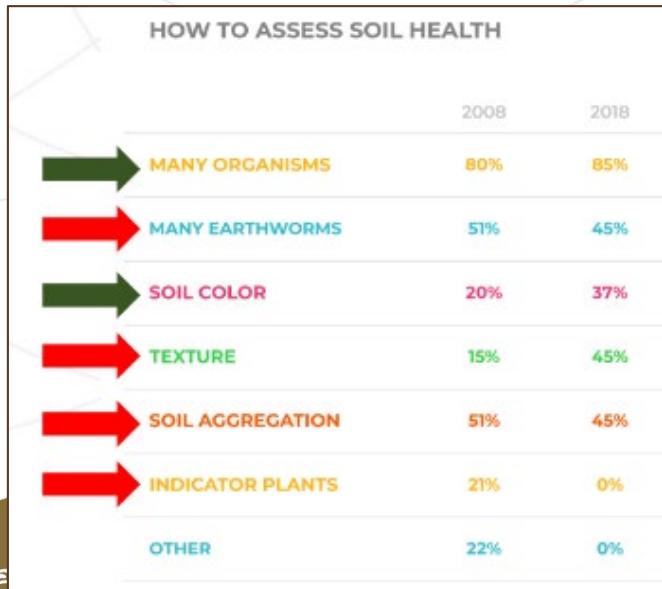
Land degradation assessment considering soil biodiversity, humus forms and vegetation. (Siniscalco et al.)

- Development of a multilevel indicator for soil quality taking into account ecological succession, interaction mineral soil/biota, holistic approach



Multi-criteria evaluation of agroecological practices involving soil biodiversity, agronomic performance and farmer perception in Madagascar. (Bernard et al.)

- Soil management practices (16 types) were tested in the field with the objective to enhance soil biodiversity (73 parameters), plant yield and sustainability (19 descriptors); socio-economic performance (8 descriptors) evaluated by farmers.



Perceptions on soil macrofauna in the agricultural field in Brazil. (Dudas et al.)

- Most of macrofauna is perceived as pests, not beneficial
- Decreasing trend of good practices, increasing perceived occurrence of pests
- Need to raise awareness



Core questions:

3. What are the economic incentives, subsidies and financial mechanisms that could support soil biodiversity and sustainable production? Can they be realigned, and how?



Conclusions / key messages

- Comprehensive, holistic approaches through participatory strategies to increase awareness are needed when formulating actions to promote soil biodiversity.
- Connection soil health – plant health – human health.



Conclusions / key messages

- Need of continued research, in time and space: unbalanced regional research – e.g. big gap in Africa.



Conclusions / key messages



- Need to evaluate organic residues and biofertilizers in the frame of circular economy: standarisation, quality control

Conclusions / key messages

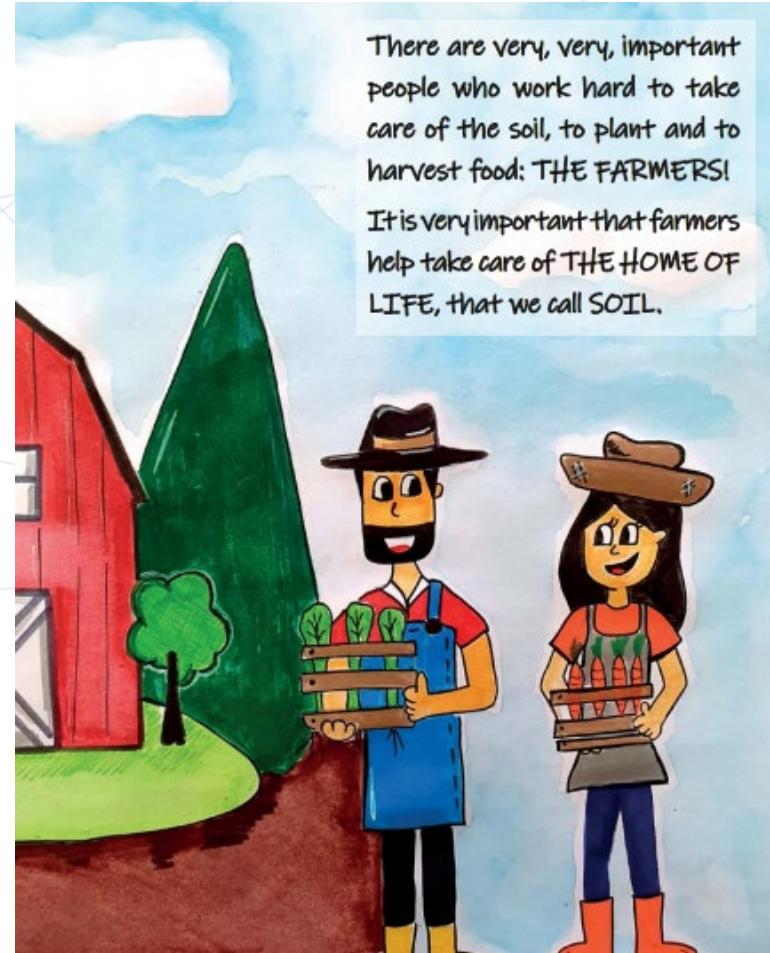
- The introduction of biological indices in existing MRV mechanisms in SSM is feasible and proved successful in some cases.



Conclusions / key messages

- Need to formulate proposals of financial instruments to incentivize soil biodiversity protection and promotion.

Threats to soil threaten our environment, food, and health. **You can help** by caring for the soil around you, telling people about the importance of soil, and protecting the creatures who live in and around soil.



A background illustration featuring a dense, organic pattern of various microorganisms and cells. The organisms are rendered in white and light gray, creating a sense of depth and biological complexity. The shapes include elongated cells, amoeba-like forms, and more complex, multi-cellular structures, all set against a light gray background.

Thanks to the organizers, to the FAO
staff, to all participants
and
Thank you for
your attention!