

4th Meeting of the Near East and North African Laboratory Network (NENALAB)

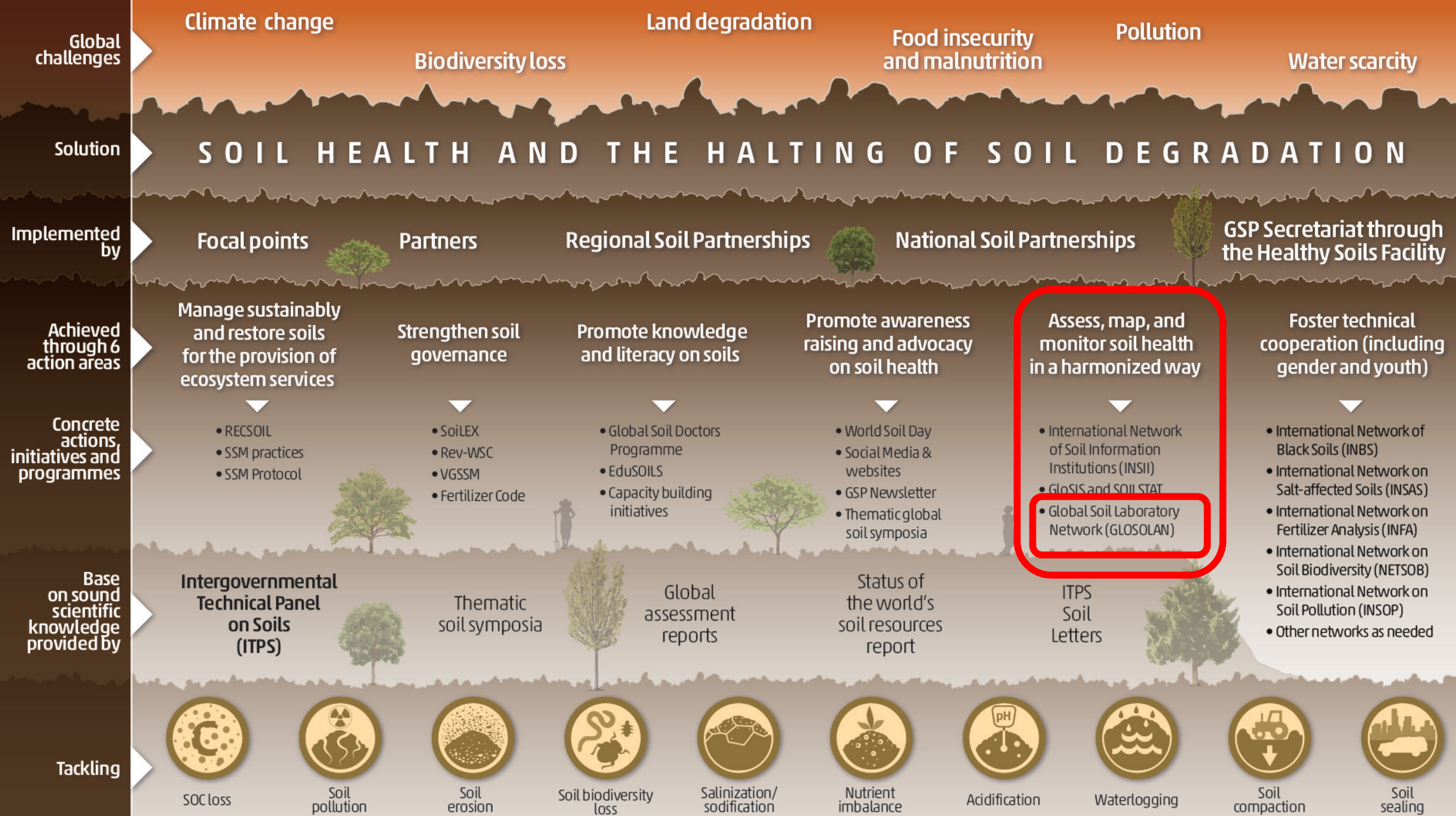
22 January 2024

The Global Soil Laboratory Network (GLOSOLAN) and its initiative on soil spectroscopy (GLOSOLAN-Spec)

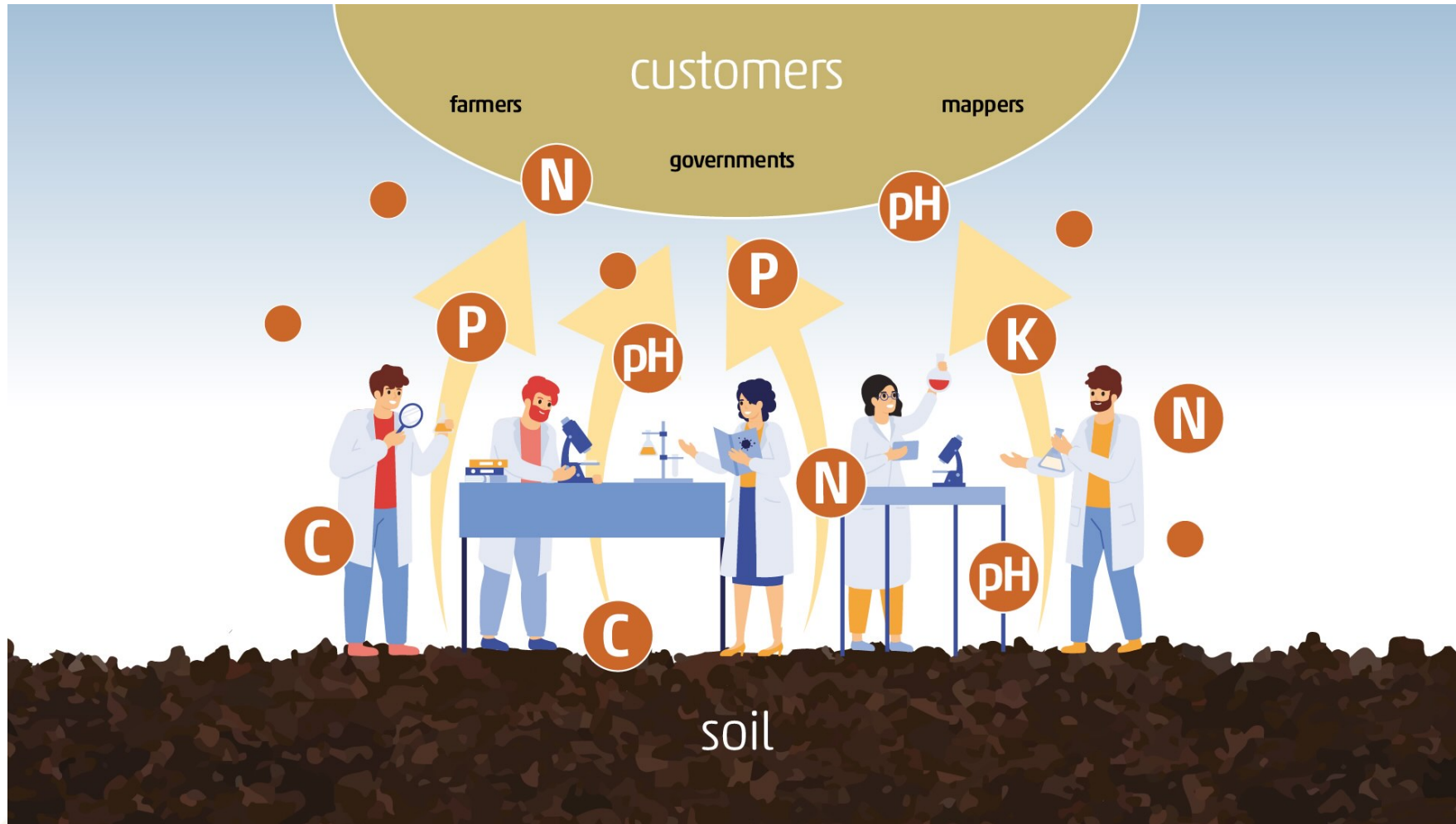
Mr. Filippo Benedetti, FAO



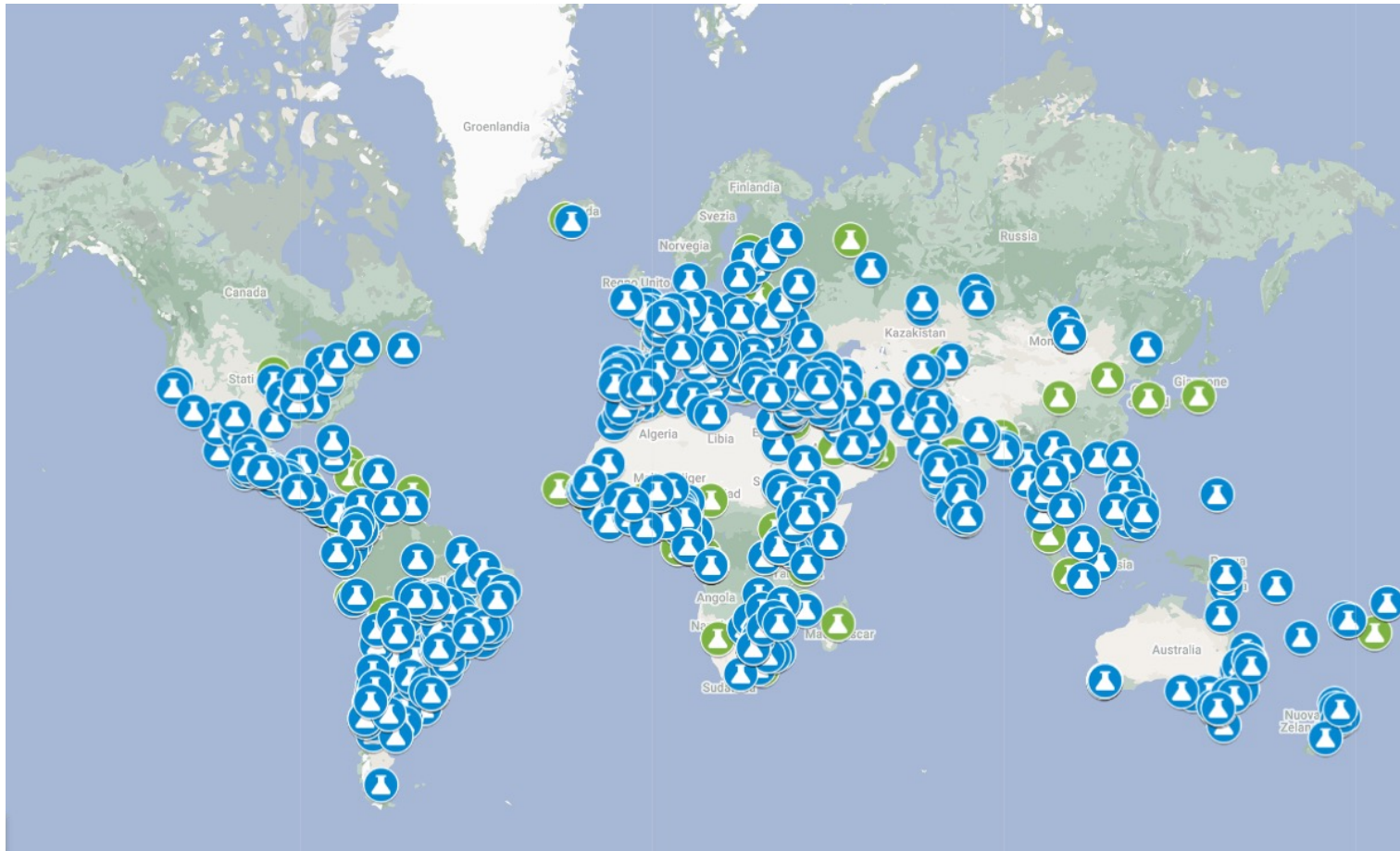
NENALAB
NEAR EAST AND NORTH AFRICAN SOIL LABORATORY NETWORK



Soil laboratories: where soil samples become data



GLOSOLAN: bringing soil laboratories to the forefront worldwide since 2017

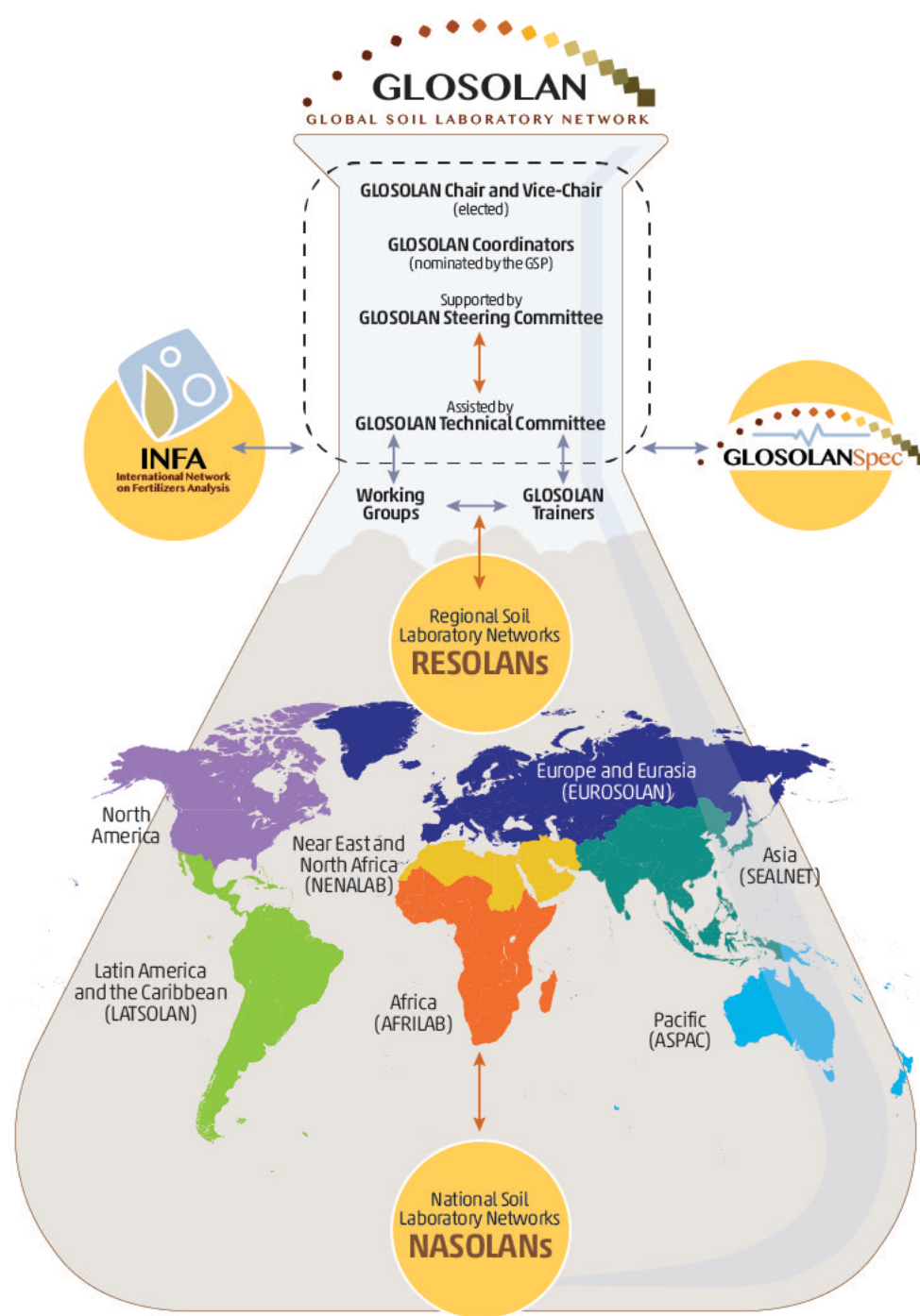


Currently grouping together around 1 000 soil testing institutions from around 170 countries



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We operate at all levels...

GLOBAL



REGIONAL



NATIONAL

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Collaborative and participative approach ...



... where the most advanced laboratories help those who need to improve

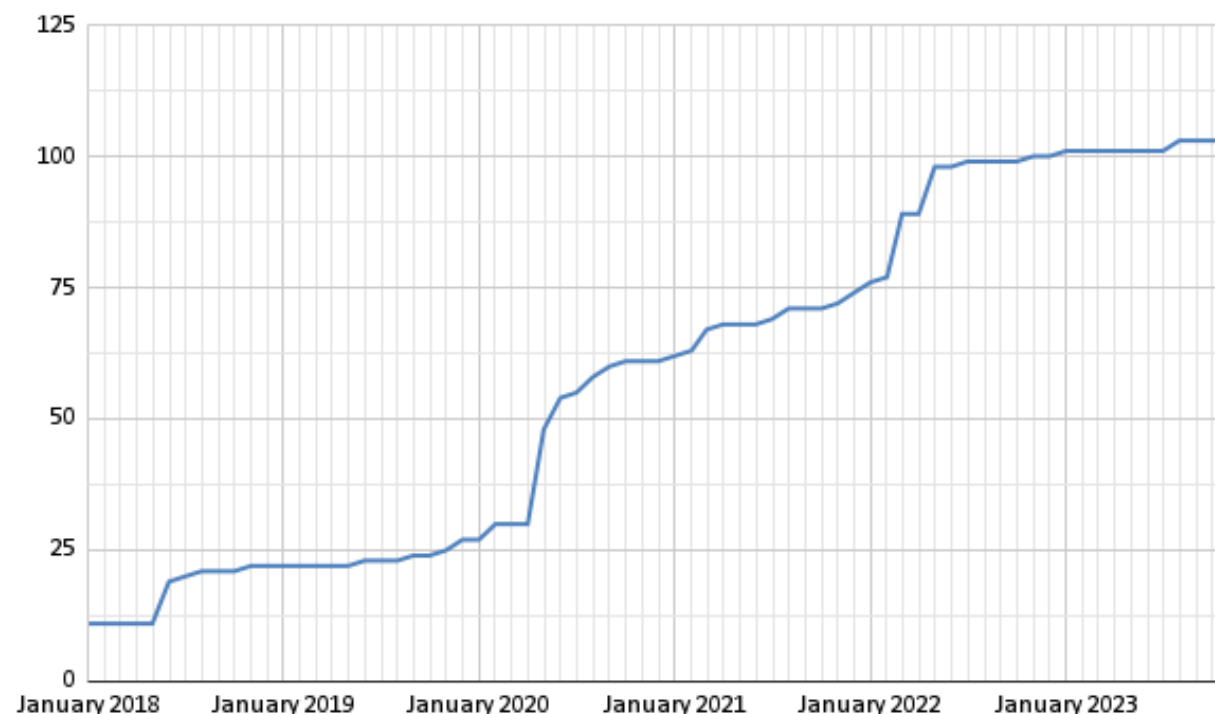
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Current status of NENALAB

103 registered laboratories

*Algeria, Bahrain, Egypt, Iran, Iraq,
Jordan, Kuwait, Lebanon, Libya,
Morocco, Oman, Palestine, Qatar,
Saudi Arabia, Sudan, Syria, Tunisia,
United Arab Emirates, Yemen*

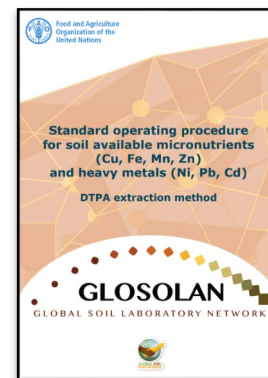


Harmonization of Standard Operating Procedures (SOPs)



Globally harmonized protocols, with a bottom-up, collaborative and inclusive approach.

- Include step-by-step instructions, sections on health and safety, quality assurance and control (QA/QC),
- Contribute to the replicability of an analysis and to the quality and reliability of the data
- Available online, for free and in several languages.



New SOPs published in the last months:

- Soil respiration rate
- Soil moisture by gravimetric method
- Cation exchange capacity and exchangeable bases
- Available micronutrients by DTPA extraction method
- Quasi total elements in soil by acid digestion including heavy metals
- Microbial biomass
- Bulk density

Under publication:

- Boron by hot water extraction

Under final review:

- Particulate organic carbon by physical fractionation
- Microbial enzymes

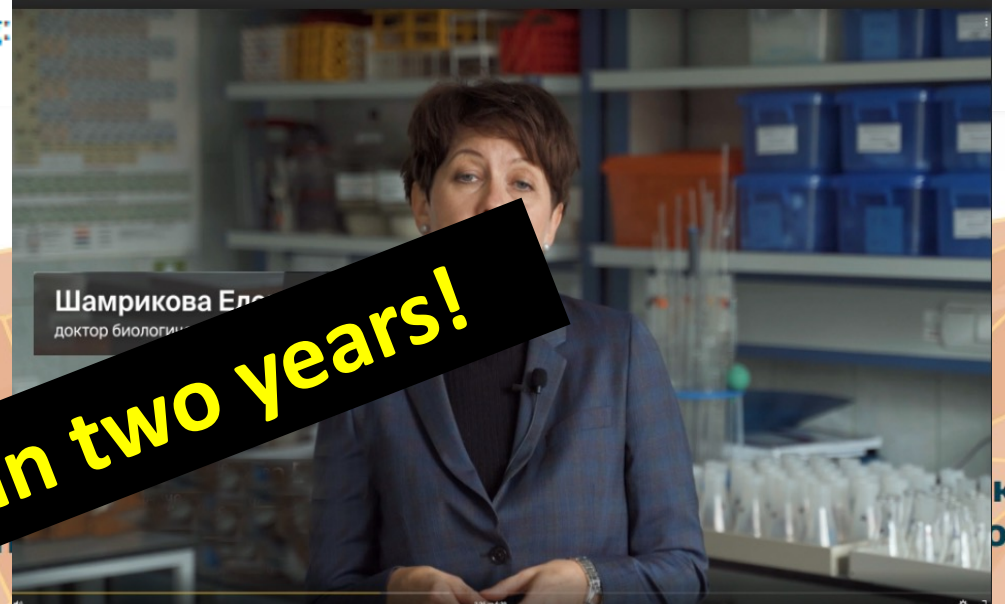
4th Meeting of

Experts from the other GSP Technical Networks supported the harmonization and review of the SOPs from joint working groups





指示剂：邻菲咯啉-亚铁络合物，0.025M。在我们的实验室中用作指示剂



Шамрикова Елена
доктор биологии

Almost 10 000 views in two years!

Walkley-Black method
Titration and colorimetric method

Walkley-Black
titulación y colorimétrica

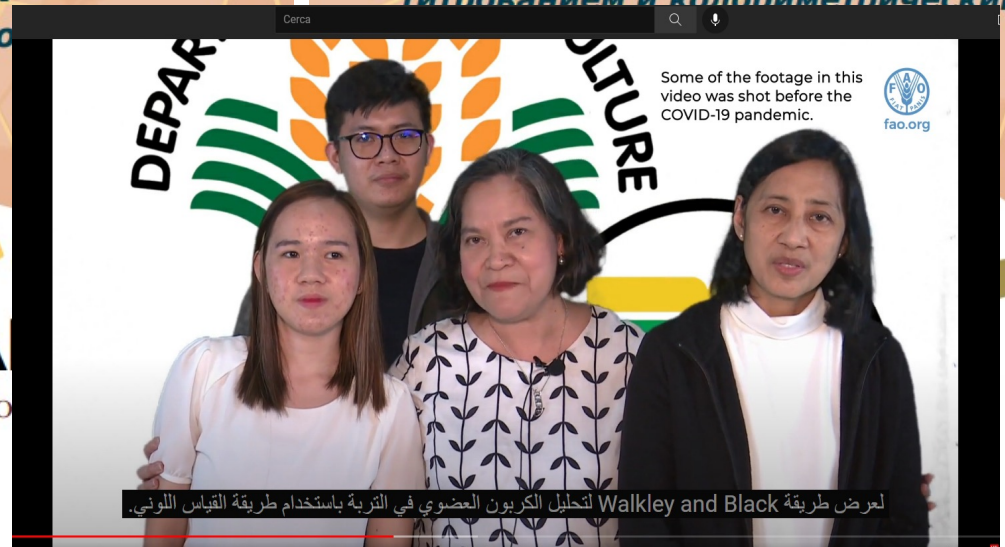
методом Уокли-Блэка
титрованием и колориметрическим



Dr. Sumitra Wattana
Director of Office of Science for Land Development
Land Development Department

您好，我是泰国农业部土地开发局，

SOLAR
LABORATORIO



DEPARTAMENTO DE AGRICULTURA

Some of the footage in this video was shot before the COVID-19 pandemic.

لعرض طريقة Walkley and Black لتحليل الكربون العضوي في التربة باستخدام طريقة القياس اللوني.

Capacity building

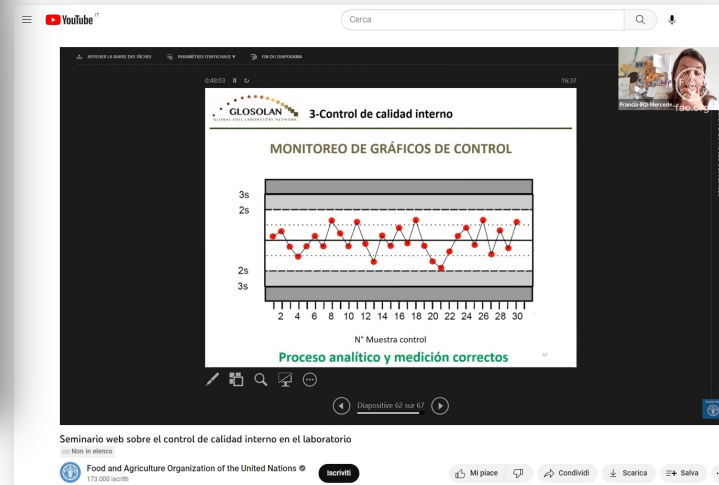
- In-person training sessions
 - Djibouti, December 2022
 - Uzbekistan, May 2023
 - Dakar, October 2023
- Webinars
- Video training
- Guidelines

Several topics covered:

- SOPs implementation
- Quality control and good practices
- Health and safety
- Equipment
- Soil spectroscopy



Uzbekistan, May 2023



Webinar on quality control, in Spanish, July 2022



Djibouti, December 2022



GLOSOLAN global PT 2021-2022

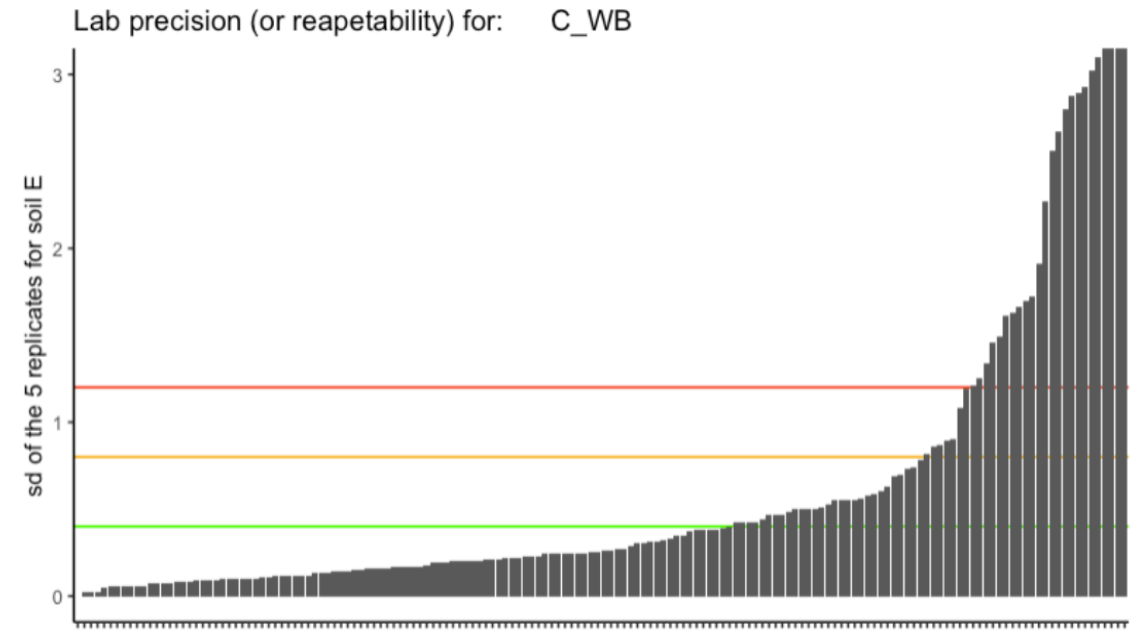
- 240 laboratories from around 110 countries
- Targeted parameters: C, N, P (using GLOSOLAN SOPs)
- Each lab received a set of 10 homogenized (sterilized) soil samples (6 soil types/5 blind replicates)
- Thanks to the support of BGS (UK) and IRD (France)



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Outcomes

- Around half of the participating laboratories provided **precise result**. However, the **remaining half of the labs showed to have some problems and a consistent number of labs have serious problems with analytical accuracy and precision**
- GLOSOLAN needs to continue investing in harmonizing SOPs and assessing and monitoring laboratory performance through global, regional, and national PTs.
 - Build the capacity to organize PTs
 - **Launch of 3 regional PT in 2023**
 - **Eurasia (led by RUSOLAN, thanks to the support of PhosAgro)**
 - Asia (led by the Philippines)
 - Africa+NENA (thanks to the support of BGS and IRD)
 - Launch of several national PTs
- High-performing laboratories have a key role to play in helping and training less successful laboratories on a regular basis

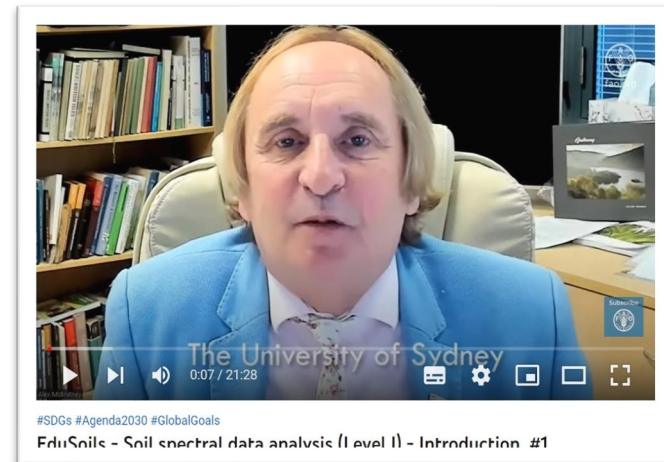


Exchange of soil samples for scientific purposes remains a major issues in many countries

GLOSOLAN initiative on soil spectroscopy (GLOSOLAN-Spec)



- Primer for soil spectroscopy: to introduce theory and concepts of soil spectroscopy at the beginner level (available in different languages)
- Training in soil spectral modelling in R (six sessions)
- Webinars with spotlight on state-of-art, research and discussion
- Launch of the International Capacity Development Group on Soil Spectroscopy (SoilSpecNet)



UPCOMING TRAININGS

- Artificial intelligence and machine learning in soil spectroscopic modelling
5 July 2023 | 9:00 CEST
SPEAKERS: Zefang Shen and Raphael Viscarra Rossel
LANGUAGE: English
[Details of the event](#) | [REGISTRATION](#)

PAST TRAININGS

- Soil Spectroscopy and Deep Learning-based modeling for decision-making in agricultural contamination
3 March 2023 | 15:00 CEST
SPEAKER: Franck Albinet
LANGUAGE: English
[Details of the event](#) | [WATCH the RECORDING](#) | [DOWNLOAD the PRESENTATION](#)
- Towards operational large-scale soil spectral libraries
11 October 2022 | 14:30 CEST
SPEAKER: Leonardo Ramirez-Lopez
LANGUAGE: English
[Details of the event](#) | [Presentation \(available soon\)](#) | [Video recordings](#)
- Soil sample preparation for MIR measurement. Is fine grinding necessary for accurate MIR predictions?
07 September 2022 | 16:00 CEST
SPEAKER: Dr Nuwan Wijewardane
LANGUAGE: English
[Details of the event](#) | [Presentation](#) | [Video recordings](#)
- Interpretation of mid infrared spectra of soil - Direct use of spectra to provide new insights

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Outcomes of the 7th GLOSOLAN meeting *(November 2023)*

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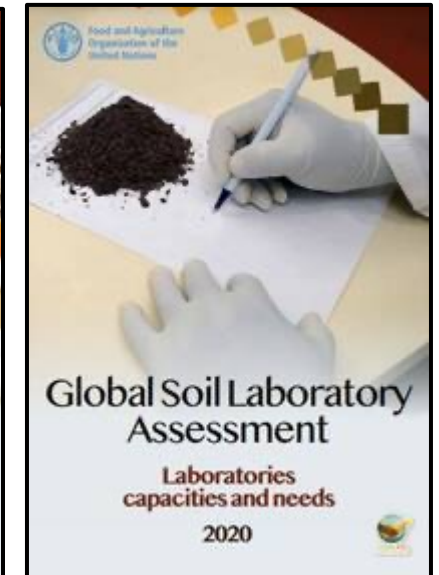


Monitoring laboratories needs and capacities

Launch of the **GLOSOLAN global assessment 2023-24** (*GLOSOLAN coordinator*)

Questions on:

- Status of laboratories and national analytical capacity
- Number of samples processed per year and main customers
- Quality control measures adopted
- SOPs adoption
- Measurement of specific groups of parameters (e.g., soil fauna, pollutants, salinity)
- Soil spectroscopy
- Health and safety and waste disposal
- Capacity building
- Main needs



Health and Safety in the laboratory



- Continue the delivery of PPE
GLOSOLAN coordinator
- Webinars on risk assessment
GLOSOLAN working group and Technical Committee
- Publication of the guidelines on reagents disposal
Ready, to be finalized (GLOSOLAN coordinator)



Quality Control

- Webinars: calibration, PT organization, etc.
GLOSOLAN coordinator to facilitate
- Cookbook on statistical analysis
Draft ready (GLOSOLAN Technical Committee)
- Support the organization of national PTs
GLOSOLAN Governance + GLOSOLAN coordinator
- Implement regional PTs in Asia, **NENA**+Africa, Eurasia
(RESOLAN Governance + GLOSOLAN coordinator)

If you are interested to organize a national PT, please write in the chat or contact Filippo (filippo.benedetti@fao.org)

Equipment



- Procurement of basic equipment (e.g., pipette, standard weights, balances, etc.)
→ **Establish selection criteria**
GLOSOLAN governance + GLOSOLAN coordinator
- Webinar on equipment purchasing, use and maintenance
RESOLAN to facilitate

SOPs

- **Finalize** pending SOPs
GLOSOLAN coordinator + established working groups
- **Review** GLOSOLAN SOPs
Working group + other networks + GLOSOLAN Technical Committee
- **Translate** GLOSOLAN SOPs (French, Spanish, Portuguese, Arabic, Chinese)
RESOLANs to facilitate
- **Transfer functions** (+ validation data)
GLOSOLAN Technical Committee and volunteering laboratories
- **Comparison** exercise between GLOSOLAN SOPs and **ISO** protocols
GLOSOLAN Technical committee
- **Comparison** exercise between GLOSOLAN SOPs and **national standards**
National Reference Laboratories and NASOLANs
- **Raise the awareness** on GLOSOLAN SOPs
→ adoption through national/international laws/directive
GSP Secretariat to liaise with the Focal Points



Collaborations



- INSAS, INSOP, NETSOB, INSOILFER
(GLOSOLAN Chair + vice-Chair)
- IGC of ISSPA
(GLOSOLAN governance to decide who to delegate)
- FAO's Symposium on soil information and data 2024
(GLOSOLAN governance and coordinator)

RESOLANs



- Consider the proposal to establish **thematic working groups** (e.g. quality control, health and safety, etc.)
RESOLAN governances
- Consider **in-person** training and workshops
RESOLAN governances + GLOSOLAN coordinator
- Continue supporting the establishment of national soil laboratory network (**NASOLANs**)
RESOLAN governances
- Foster the collaboration with ASPAC to support lab in the **Pacific**
GLOSOLAN coordinator



Laboratory management

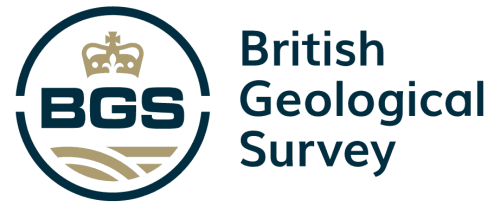
- Organization of other webinars on glassware **washing**
(*GLOSOLAN Coordinator to find speakers*)
- **Guidelines** on glassware washing
(*GLOSOLAN Technical Committee*)
- Develop a matrix to be used as an **example** for the Laboratory Information Management Systems (**LIMS**) to be uploaded on the GLOSOLAN website
(*GLOSOLAN Technical Committee*)
- Webinar for laboratory **managers** on how to organize continuous training of the lab staff members
(*GLOSOLAN Coordinator to find speakers*)

Others

- GLOSOLAN lab **calendar** 2024: call for photos
GLOSOLAN coordinator + GLOSOLAN governance to select the material
- 8th GLOSOLAN meeting **2024** format



Thanks to the kind support of



กรมพัฒนาที่ดิน
LAND DEVELOPMENT DEPARTMENT
กระทรวงเกษตรและสหกรณ์

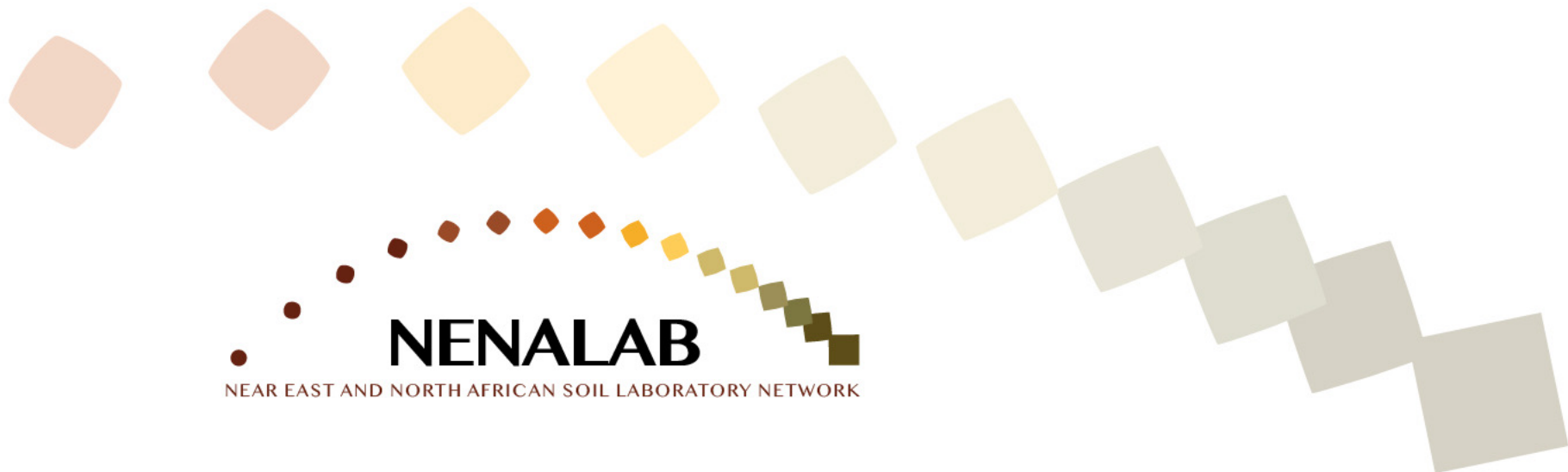


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Food and Agriculture
Organization of the
United Nations



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