



Food and Agriculture
Organization of the
United Nations

21-23 November 2023

GLOSOLAN activities in 2023 and future challenges

Ms. Miriam Ostinelli, GLOSOLAN Chair

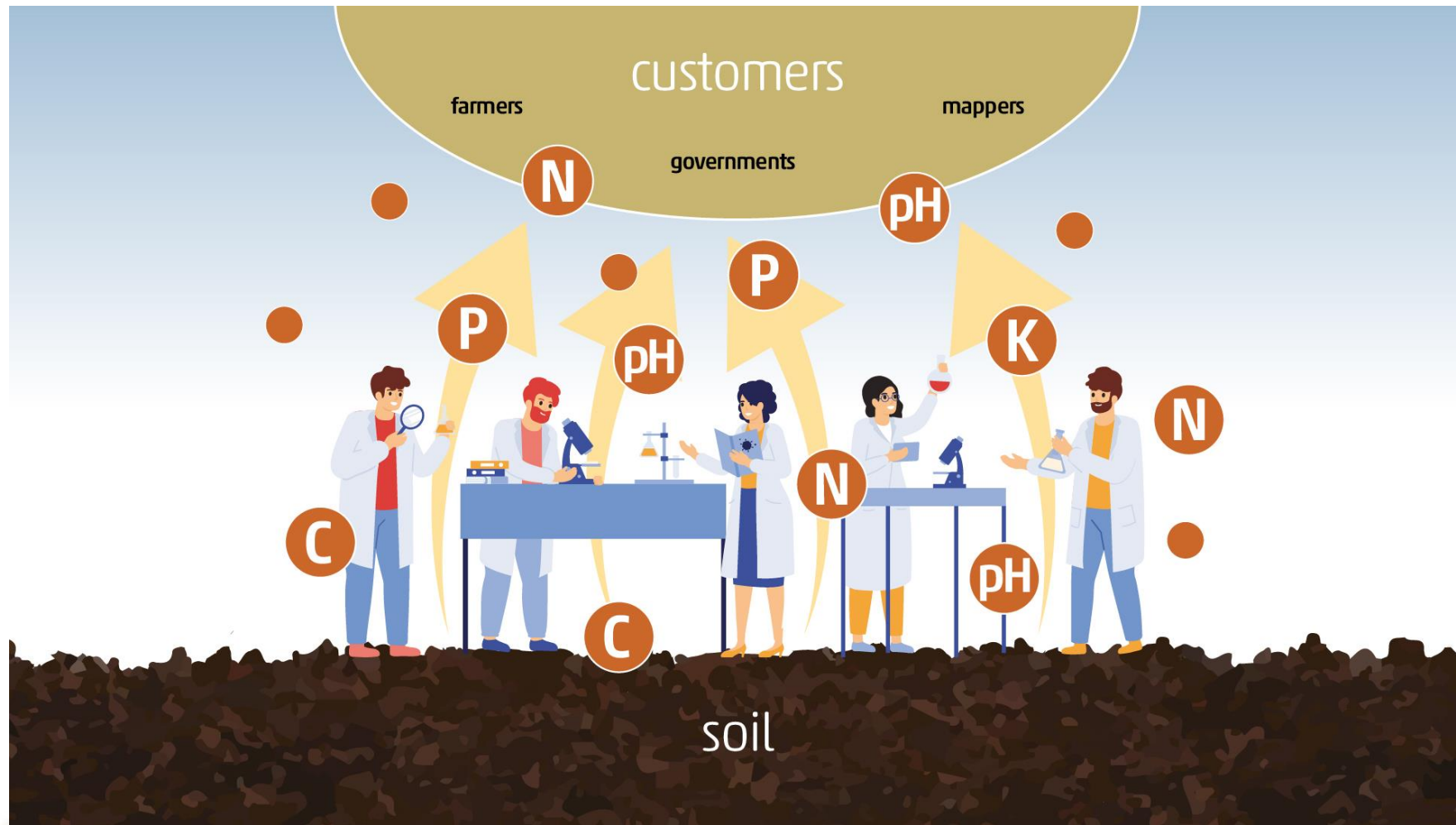
7th Meeting of the
**Global Soil
Laboratory
Network**
(GLOSOLAN)



GLOSOLAN
GLOBAL SOIL LABORATORY NETWORK



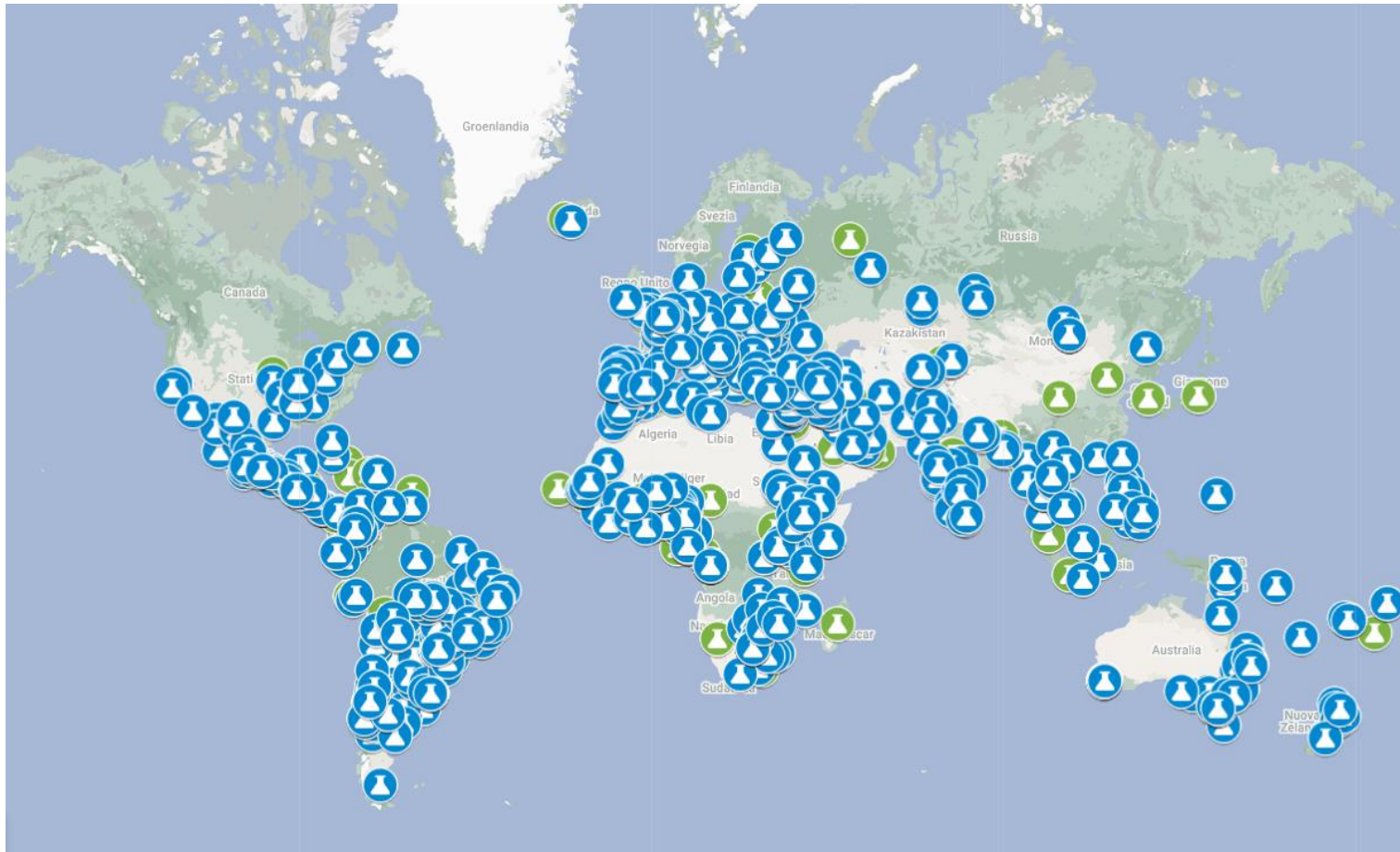
Soil laboratories: where soil samples become data



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GLOSOLAN: bringing soil laboratories to the forefront worldwide since 2017



Currently grouping together around 1 000 soil testing institutions from around 160 countries



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We operate at all levels...

GLOBAL

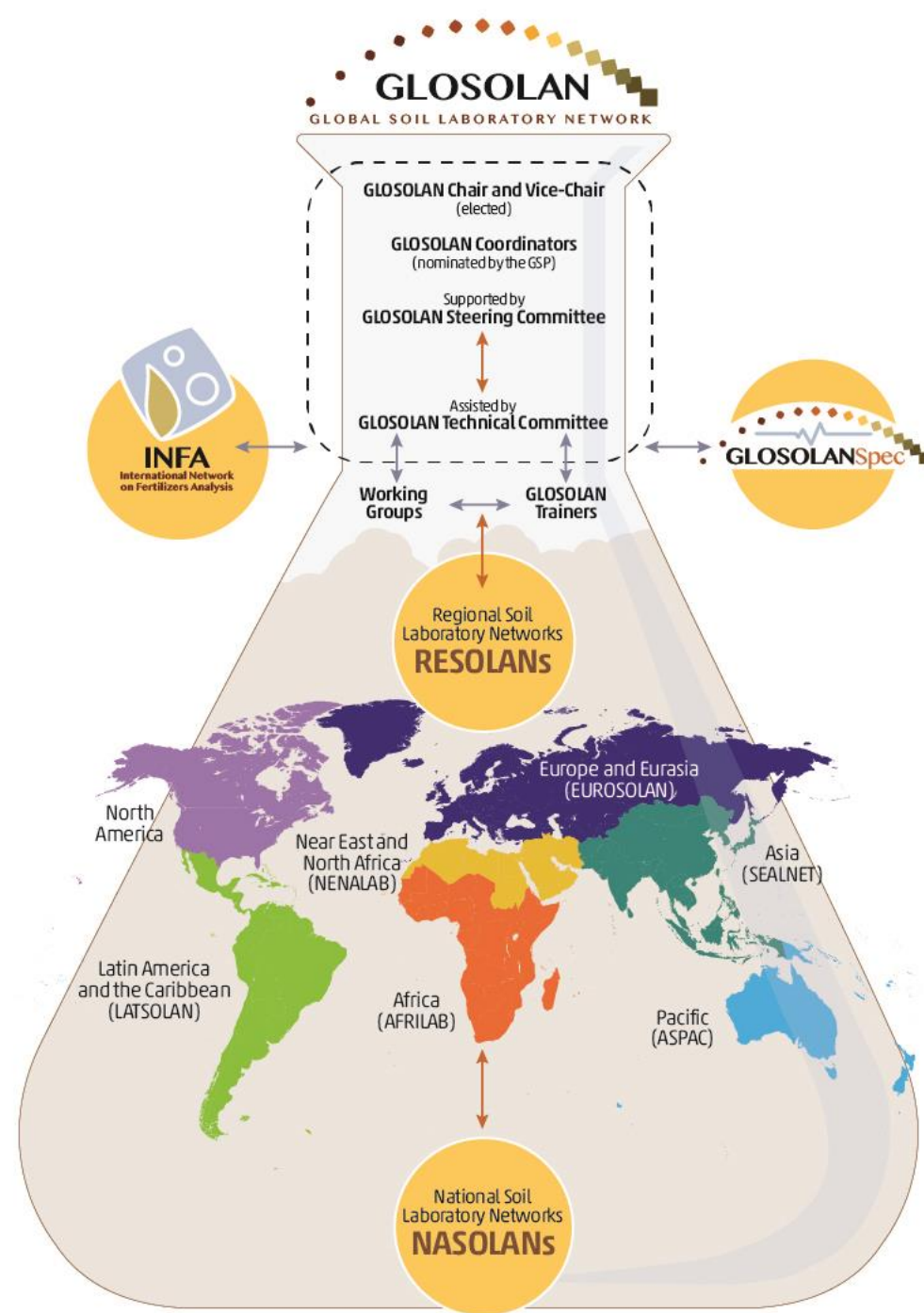


REGIONAL



NATIONAL

7th Meeting of the **Global Soil Laboratory Network**



Collaborative and
participative
approach...



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

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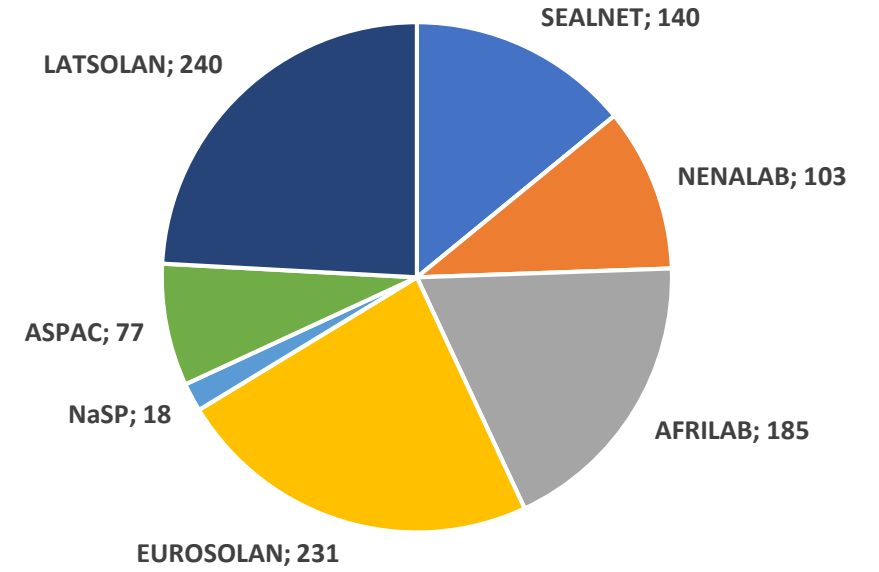


Status of GLOSOLAN

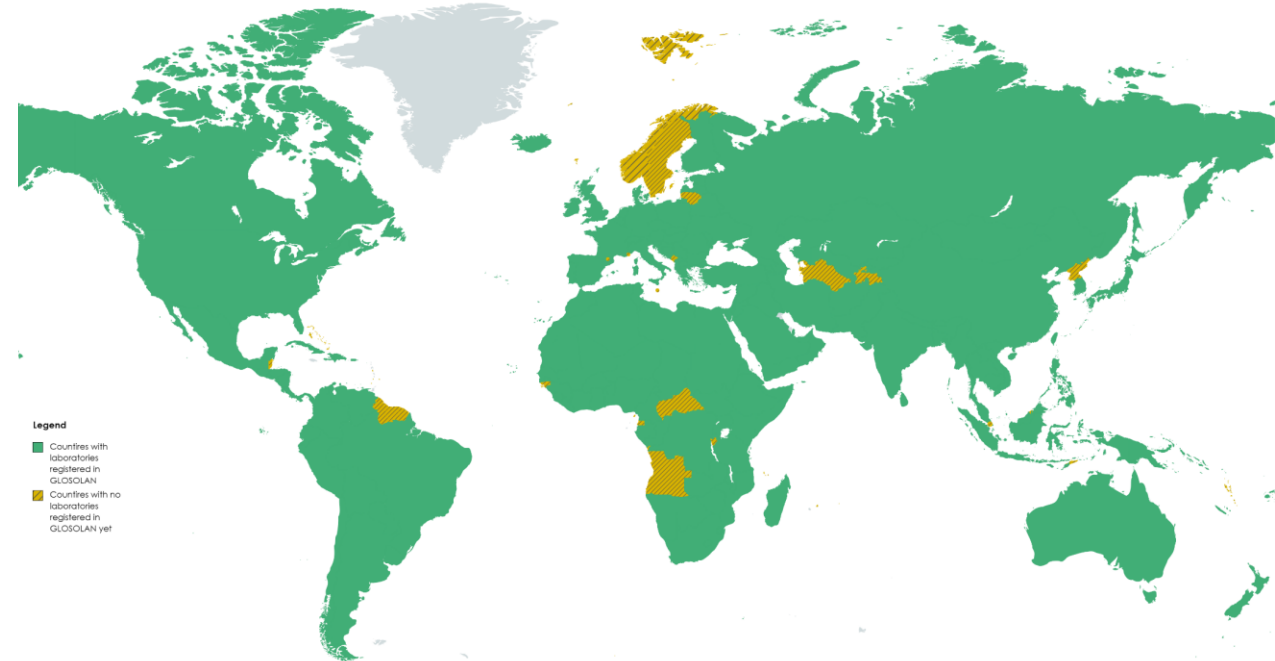
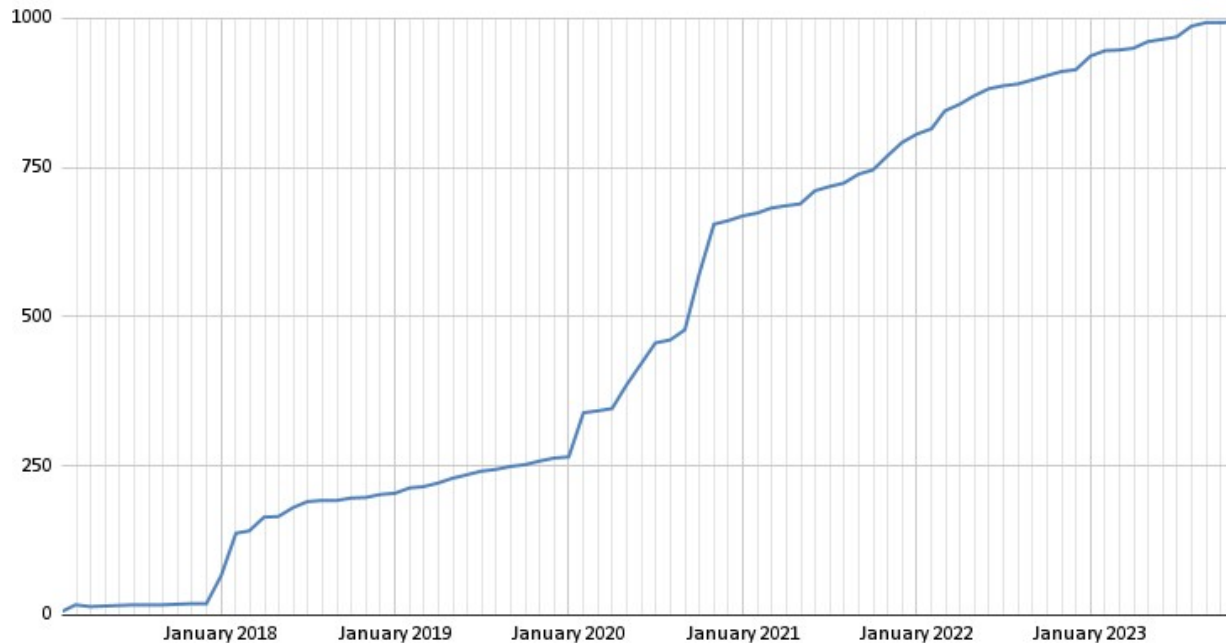
Currently **999** registered soil laboratories from 160 countries

(→ around **3 000** lab heads and technicians involved)

GLOSOLAN participation by region



GLOSOLAN growth

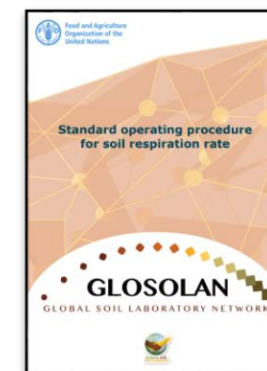
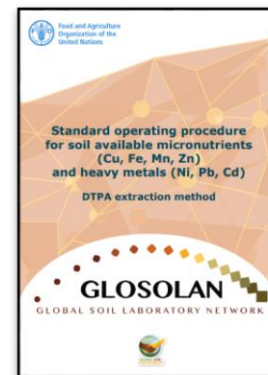


Harmonization of Standard Operating Procedures (SOPs)



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
- Bulk density

Under publication:

- Boron by hot water extraction

Under final review:

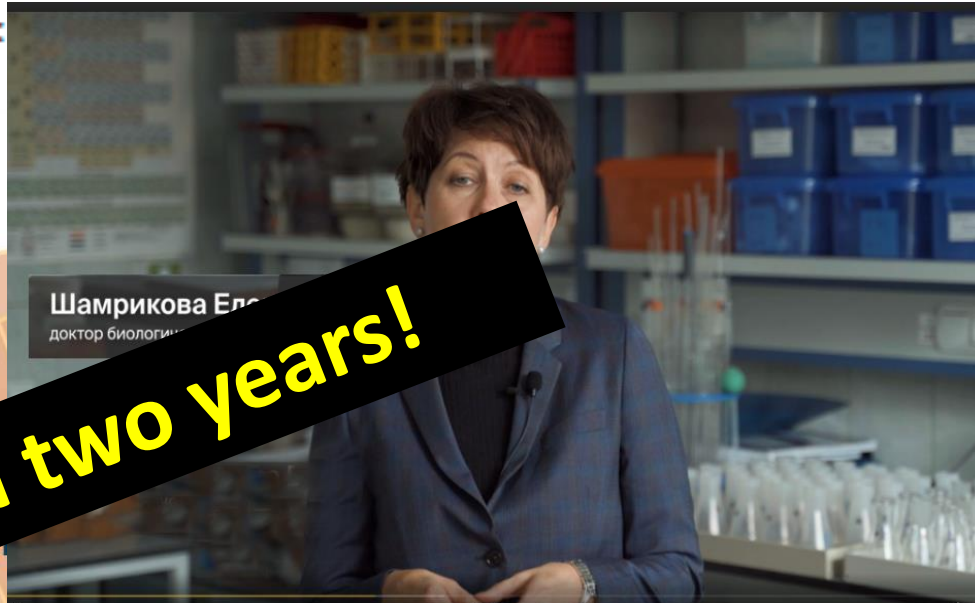
- Particulate organic carbon by physical fractionation
- Microbial biomass
- Microbial enzyme activities

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



The m

the following:



Standards

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

Over 10 000 views in two years!

Walkley-Black method
Titration and colorimetric method

Walkley-Black
titration and colorimetric method

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,



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

لمعرض 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
- Many activities ongoing at regional and national scales



Uzbekistan, May 2023



Djibouti, December 2022



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Raising confidence in quality measurements from soil laboratories in Sub-Saharan Africa

Dakar, 23-27 October 2023



network (GLOSOLAN) | 21-23 November 2023



In-person training on *raising confidence in quality measurements from soil laboratories in Sub-Saharan Africa*

Over 80 soil laboratory technicians from 40 Sub-Saharan countries gathered together in Dakar (Senegal) on 23-27 October 2023



GLOSO

Capacity building

- 4 new webinars implemented in 2023, over 1 000 participants
- New webinar calendar for 2024
- Video training
- Review of FAO Bulletin 74
- Guidelines on reagents disposal

Several topics covered:

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



Actividad del laboratorio y características de la limpieza del mater

10. ¿Controla el resultado del lavado de alguna manera?

Response	Count	Percentage
SI (Yes)	18	36%
NO (No)	32	64%

Considerar:

- ✓ Necesidad de control del lavado
- ✓ Posibilidades de control en cada tipo de ensayo
- ✓ Registro del control
- ✓ Dinámica del trabajo en el laboratorio y eficiencia
- ✓ Costos
- ✓ Ventajas / Desventajas de cada opción

GLOSOLAN workshop on cleaning and washing soil laboratory glassware and equipmen | 7 August 2023

Webinar on cleaning and washing soil laboratory glassware and equipment (in Spanish), August 2023

Food and Agriculture Organization of the United Nations

How to set up a new soil laboratory

Setting up a new soil laboratory is not an easy task as it is rather an overwhelming challenge. As a laboratory manager, when you decide to set up a new soil laboratory, you need to consider not only the laboratory management but also the technical management plan. Below are reported some preliminary steps that you should take into consideration when setting up a new soil laboratory.

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Ongoing and future inter-laboratory proficiency tests (PTs)

- Launch of 3 regional PTs in 2023:
 - **Eurasia** (led by RUSOLAN, thanks to the support of PhosAgro) – Main topic: CARBON
 - **Asia** (led by the BSWM - Philippines): C, pH, N, P, K, particle size distribution
 - **Africa+NENA** (thanks to the support of BGS and IRD)
- Launch of several national PTs
- Launch of a global GLOSOLAN PT in 2024 (expectations: around 300 labs participating)

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

- High-performing laboratories have a key role to play in helping and training less successful laboratories on a regular basis
- GLOSOLAN will continue building the capacity of countries to organize PTs and will facilitate the organization of regional/global PTs



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



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



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



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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Joint work with other GSP Tech. Networks

- Review GLOSOLAN SOPs (biological parameters, salt-affected soils related parameters, heavy metals and pollutants)
- Develop technical documents (e.g., guidelines on reagents disposal)
- Organize together workshop and webinars
- Experts from GLOSOLAN help other GSP Technical Networks to develop SOPs (e.g. INSOP, INSOILFER) and organize workshop together



Participation to international conferences

17th International Symposium on Soil and Plant Analysis (ISSPA)
Concepción, Chile – March 2023

- One keynote presentation on GLOSOLAN activities and mission
- Four presentations during the technical sessions on:
 - *GLOSOLAN SOPs: a trigger to face emerging challenges on sustainable soil management worldwide*
 - *Soil laboratories: key players in the development and use of soil quality and health indicators*
 - *GLOSOLAN PTs: how reliable are soil laboratory measurements worldwide?*
 - *The contribution of soil laboratories to the sustainable management of fragile and degraded soils*



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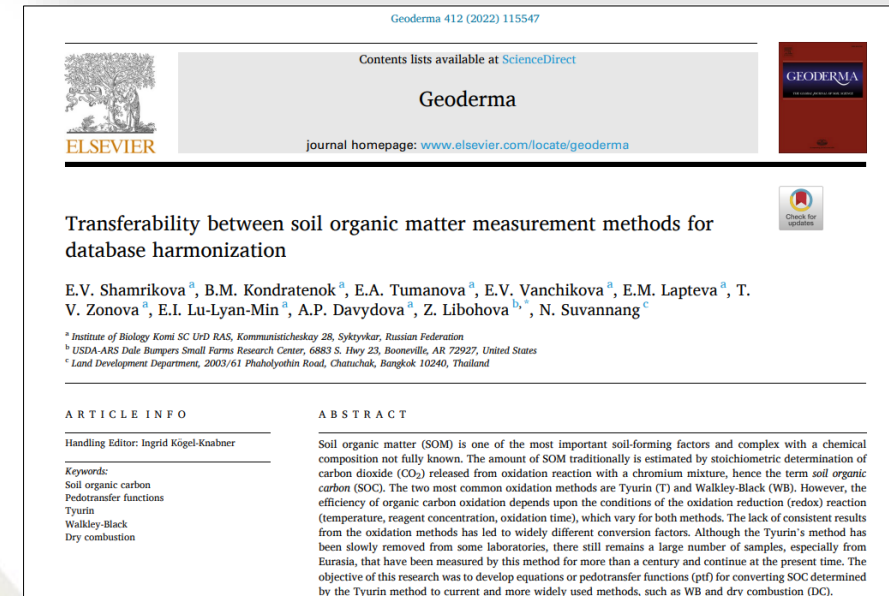
Involvement in other GSP initiatives and programs

- RECSOIL (e.g., lab training in Togo)
- SOILCARE project
- SoilFER project



External collaborations

- FAO Regional Office for Asia and the Pacific: **Asian knowledge hub** - Webinar on soil labs and soil testing kits (7-8 November 2023)
- **ISO**: first discussion on potential cooperation held in October 2023
- GLOSOLAN invited to join the International Governance Committee (**IGC**) for the International Symposium on Soil and Plant Analysis (**ISSPA**)
- Publication on **scientific journals** (PT outcomes, transfer functions, etc.)

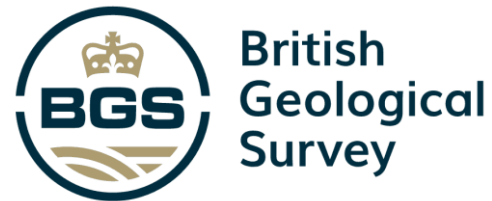


What's next?

- Review and translate GLOSOLAN SOPs and other documents
- More in-person workshops
- Regional and global PTs
- Procurement of laboratory equipment
- Development of scientific literature and reports
- Strengthening the activities of GLOSOLAN-Spec
- FAO global symposium on soil data quality – 2024
- World Soil Day 2024 theme: **soil measurement**



Thanks to the kind support of



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Thank you for your attention!

