Food and Agriculture Organization of the United Nations

GLOBAL SYMPOSIUM ON
SOIL INFORMATION AND DATA
MEASURE | MONITOR | MANAGE

September 25-28, 2024 | Nanjing, China

CONCEPT NOTE

GLOBAL SOIL PARTNERSHIP

Global Symposium on Soil Information and Data - GSID24

September 25-28, 2024, |Nanjing, China

Concept note

The Global Symposium on Soil Information & Data (GSID'24), co-organized by the Food and Agriculture Organization's Global Soil Partnership and the Institute of Soil Science, Chinese Academy of Sciences (ISSCAS) will be held in Nanjing, China, September 25-28, 2024. This symposium serves as an international forum for stakeholders, encompassing policymakers, researchers, and practitioners, to explore the important role of comparable and reliable soil data and information in addressing global challenges such as food security, climate change, and sustainable agricultural management. Emphasising the significance of data-driven decision-making, GSID'24 aims to catalyse the development and implementation of policies grounded in robust soil data, thereby enhancing the efficacy of global efforts towards sustainable development and climate resilience.

Main objectives of the symposium

- To showcase cutting-edge advancements as well as identifying knowledge gaps in soil data collection and analysis, including innovative survey, description and sampling, monitoring and analytical methods, remote sensing technologies, digital soil mapping, and the application of artificial intelligence and machine learning in soil analysis and mapping.
- Present success cases for the establishment of soil information systems following FAIR (Findable, Accessible, Interoperable, Reusable) standards
- To present strategies to unlock the potential of quality soil data in informing policy decisions at national and international levels as well as management decisions at field scale, and in driving effective strategies for global development initiatives.
- To discuss ethical considerations and data ownership in soil science, ensuring the protection of individual and community rights while fostering open scientific inquiry and collaboration.
- To highlight the importance of capability and capacity building and open data by underscoring the role of information systems, cloud-computing technologies and collaborative platforms.

Thematic overview

At the Global Symposium on Soil Information and Data (GSID'24), the central theme focuses on the crucial role of comparable and reliable soil data in addressing contemporary global challenges. This symposium will examine advancements in soil data technology, the standardisation and harmonization of analytical as well as data management methods, emphasizing the potential of artificial intelligence (AI) to revolutionize soil data analysis and its applications. Highlighting innovations in soil sampling, analysis, mapping, monitoring, and the integration of AI and machine learning, the event underscores the transformative impact of these technologies in soil science. Emphasis will be placed on soil data quality methods for soil analysis, discussing enhancements in laboratory techniques and the emergence of proximal sensing solutions.

The symposium will explore the application of soil data in shaping policy and informed decision-making, underscoring its significance in global development agendas, food security, and natural

resource management. Additionally, it will emphasize the importance of soil data in decision-making at the farm level, aiding in the selection of suitable crops and optimizing management practises for sustainable agriculture. Ethical considerations, data ownership, and nurturing collaboration through open data initiatives will also be key discussion points. Moreover, the event will address capacity building and stakeholder engagement (for example through citizen science), essential for effective data management and inclusive policy formulation.

The thematic structure of GSID'24 is designed to provide a comprehensive understanding of current challenges and future directions in soil science, highlighting the critical importance of soil data in sustainable development, climate change mitigation and adaptation and environmental stewardship, and its crucial role in enhancing farm-level agricultural decisions.

Theme 1 Mainstreaming Soil Data: Innovations in Analysis, Standardization, Harmonization and Communication

Theme 1 addresses on solutions and challenges in soil analysis, soil data quality, standardization, harmonization and its associated uncertainty. The theme's primary objectives are to highlight advancements in soil analysis techniques, emphasizing the importance of data quality, and explore strategies for its effective interpretation and communication.

Sub-theme 1.1: Laboratory Techniques and Standard Procedures for Soil Analysis

Sub-theme 1.1 aims to showcase the latest advancements, challenges and gaps in laboratory and field techniques for soil analysis, soil data quality, and handling. The sub-theme will focus on the development and implementation of standard operating procedures that ensure consistency, reliability, and accuracy in soil testing. Participants will explore a range of topics from traditional soil testing methods to innovative laboratory techniques, including the analysis of novel soil parameters.

Sub-theme 1.2: Soil data standardisation and harmonisation

Making data FAIR (Findable, Accessible, Interoperable, Reusable) is a major step towards more efficient data use and an increase in data informed decision making by allowing easier collation of existing and new data through annotation, standardization and harmonisation of soil data. This sub-theme addresses innovations and good practices in all four of these subtopics: metadata annotation, soil data (model and definitions) standardization, soil data harmonization through the development of transfer functions (both between lab methods and pedotransfer functions).

Sub-theme 1.3: Evaluating, interpreting and communicating soil data and its uncertainty

Sub-theme 1.3 aims to highlight strategies for effectively quality assuring and quality checking (QA/QC) soil data, estimating its uncertainty, facilitating its interpretation, and communicating soil testing results and associated uncertainty to stakeholders.

Sub-theme 1.4: The Emergence of Proximal Sensing Solutions for Soil Analysis

This sub-theme aims to discuss the challenges, new innovative solutions, and future prospects of leveraging proximal sensing technologies in soil analysis and integrating it into mainstream soil science research and practice. Proximal sensing solutions such as near and mid infrared spectroscopy and other in situ sensing systems, represent a promising solution for more rapid and cost-effective measurement of soil properties both in the lab and on-the-go as well as at various soil depths.

Theme 2 Advances in soil mapping and monitoring

Theme 2 presents innovations in soil science, encompassing optimized soil surveys and description protocols, sampling techniques, advanced digital mapping, and the integration of AI and machine learning. Each sub-theme addresses a key aspect of soil analysis and management, critical for responding effectively to challenges and opportunities in food security, land degradation, and climate change.

Sub-theme 2.1: Soil Survey and Monitoring Strategies

This sub-theme aims to present efficient, innovative and accurate soil surveys, profile descriptions, sampling and monitoring strategies. By for instance integrating remotely sensed data, optimized soil survey designs for profile description and sampling ensure that the data collected is more representative of varied soil conditions. This accuracy is crucial for making informed decisions in agriculture, environmental management, and policy-making.

Sub-theme 2.2: Digital Soil Mapping Techniques and Applications

This sub-theme aims to showcase advances in digital soil mapping for creating detailed soil maps. Digital soil mapping provides detailed, high-resolution maps that are crucial for cost-effective soil resource management. These maps help in identifying soil types, properties, and variability across different landscapes, leading to better land-use planning and agricultural practices. Additionally, this sub-theme aims to inform about the intersection of soil mapping and AI, exploring the various aspects of AI and Machine Learning in Soil Science. It highlights their potential role in enhancing soil property predictions, supporting better land and agricultural management decisions.

Sub-theme 2.3 Unlocking the potential of soil legacy data

This sub-theme aims to show-case potential uses of soil legacy data and its role in advancing contemporary soil mapping practices and data-driven decision making. Legacy data, collected through past surveys, studies, and historical records, often hold invaluable insights into soil characteristics and distribution patterns. By leveraging advanced data integration and modeling techniques, this sub-theme seeks to present strategies for incorporating legacy data into soil mapping.

Theme 3 Soil data for Policy and Decision-making

Theme 3 addresses the vital importance of soil data in driving decision-making across multiple levels, ranging from the formulation of evidence-based policies to the optimization of field input application. This theme underscores how accurate and comprehensive soil data can significantly influence both large-scale policy frameworks and localized agricultural practices.

Sub-theme 3.1: The Role of Soil Data in Achieving and Measuring the Progress on Global Development Agendas

This sub-theme explores the important role soil data plays for achieving and reporting on the progress of international and national commitments and conventions. Often overlooked, misinterpreted and scarcely available data on the status of soils represents a bottle neck when tackling ambitious projects on climate adaptation and mitigation, as well as land degradation and restoration, and biodiversity conservation. During this session, potential pitfalls, opportunities, and successful examples linked to the use of soil data for achieving and measuring progress on global development agendas will be presented.

Sub-theme 3.2: Soil Data for Improved Food Security and Resource Management

This sub-theme will explore how soil data can be integrated into decision support systems at various levels, from national policies to field-scale applications, benefiting a diverse range of stakeholders including governments, academia, extensionists and farmers. Its main objective is to demonstrate the effectiveness of soil data in enhancing food security and resource management.

Theme 4 Soil data as a common good

Theme 4 focuses on the importance of managing and using soil data as a common good. It covers ethical issues, open data platforms, collaboration in soil science, stakeholder engagement, and the need for shared access to soil data. This theme highlights the crucial role of soil and related data in supporting scientific research, policy-making, and sustainable environmental practices, emphasizing its value as a shared resource for the global community.

Sub-theme 4.1: Ethical Considerations and Data Ownership

This sub-theme focuses on addressing the complex ethical issues and ownership rights associated with the collection, usage, and sharing of soil data. The objective is to share insights on balancing the need for open scientific inquiry with the protection of individual and community rights, and addressing questions of privacy, consent, and equitable benefit sharing.

Sub-theme 4.2: Fostering Open Data, Soil information Systems and Collaborative Platforms in Soil Science

This sub-theme will focus on how open data initiatives and advanced technological systems can democratize access to soil data, thus facilitating global research, innovation, fostering international collaboration and defining priorities for effective resource mobilization.

Sub-theme 4.3: Capacity Building for Effective Data Sharing and Collaboration

This sub-theme aims to showcase strategies and programmes that enhance the skills and resources necessary for effective data sharing and collaboration in soil science. Through real-world examples and case studies, this sub-theme aims to illustrate the crucial role of capacity building in empowering researchers, policymakers, and practitioners with the tools and knowledge required for efficient data management and evidence-based decision-making.

Organization and Structure

The symposium will last three days with a field visit planned for the fourth day and will take place in a hybrid (both online and in-person) format. Events will include:

Plenary

On the fist and last day of the symposium there will be plenary keynote presentations by prominent speakers from academia, government and other sectors. They will be selected according to the symposium's themes.

Parallel sessions

Once the panels have concluded, parallel sessions will be held for the four themes. The format of the parallel sessions will be determined by the conveners (in close collaboration with the organizing and scientific committees) to ensure the themes are adequately presented and discussed to explore the key aspects needed for the outcome document.

Side events

Side events will be organized upon an open call.

Call for Abstracts

A call for abstracts will be opened from March until April, 2024. The Organizing committee will receive the abstracts that will compete for oral and poster presentations during the symposium. Abstracts should address any of the four themes and will be evaluated by the Scientific Committee. The abstracts must be written in English, maximum 2000 words in Word format and upload directly through an online module. After the evaluation of abstracts by the Symposium Scientific Committee, the authors will be notified with a decision regarding their abstract submission by May 15, 2024, and details for oral and poster presentations will be provided. Relevant international research institutes, organizations and networks will be invited to contribute papers, speakers, sessions, dedicated exhibits and/or side events.

Interpretation

There will be no interpretation in the 6 FAO languages. However, interpretation may be available in Chinese, at ISSACS's expense.

Website

The symposium website will be prepared and hosted by FAO. It will be available in the 6 FAO languages and will include the call for abstracts, the agenda and information on registration and participation in the symposium, as well as recordings of the sessions and presentations made during the symposium.

Art exhibition

An art exhibition on soils will be held at ISSACS showcasing the importance of soil information and data.

Scientific and Local Organizing Committees

The Scientific Committee will comprise representatives from ISSCAS, the Intergovernmental Panel on Soils (ITPS), the International Network on Soil Information Institutions (INSII), the Global Soil Laboratory Network (GLOSOLAN) and additional leading experts in the themes addressed in the symposium. This committee will be responsible for evaluating submitted abstracts, as well as ensuring the scientific quality of the parallel sessions and symposium outputs.

The organizing committee will be composed by ISSACS and FAO staff and will oversee the overall organization of the symposium, guide the formats of the parallel sessions, and the finalization of the symposium outcomes.

Audience

The conference will target more than 1000 participants in-person and over 5000 online, drawn from a diverse group of researchers, policymakers, representatives of international organizations, civil society, development practitioners and the private sector. Naturally, the academic and policy communities in the host country and region will actively participate in the conference and may be over-represented, in relation to other regions. High-level dignitaries along with top academics and

opinion leaders from the host country and region contribute and shape the debate together with their counterparts from around the world.

About the Conference Organizers

Institute of Soil Science, Chinese Academy of Sciences (ISSCAS)

The Institute of Soil Science, Chinese Academy of Sciences (ISSCAS) was established in 1953. Its predecessor is the Research Office of Soil, Central Geological Survey Bureau established in 1930. ISSCAS has been shouldering the important task of serving agricultural development as well as ecological and environmental protection in China since its foundation. Now it has developed into a top-notch, highly reputable, national-level research centre with a solid research base covering all disciplines of soil science.

FAO's Global Soil Partnership (GSP)

Launched by the Food and Agriculture Organization of the United Nations in December 2012, the Global Soil Partnership (GSP) is a mechanism to develop a strong interactive partnership and enhanced collaboration and synergy of efforts between all stakeholders. From land users through to policy makers, one of the key objectives of the GSP is to improve the governance and promote sustainable management of soils. Since its creation, the GSP has organized seven global symposia on topics ranging from soil organic carbon to soil and water.

Timeline:
- Concept Note | March 2024
- Establishment of the Scientific Committee | March 2024
- First Call & Save the Date | March 2024
- Second Call (Abstracts) | April 2024
- Closing of the call for abstracts | 10 May
- Abstract Submission | March 2024 – May 2024
- Abstract authors informed of their selection | 15 June
- First draft agenda | 1 july
- GSID'24 | 25-28 September 2024

    o Symposium | 25-27 September 2024

    o Field visit | 28 September 2024

The Global Soil Partnership (GSP) is a globally recognized mechanism established in 2012. Our mission is to position soils in the Global Agenda through collective action. Our key objectives are to promote Sustainable Soil Management (SSM) and improve soil governance to guarantee healthy and productive soils, and support the provision of essential ecosystem services towards food security and improved nutrition, climate change adaptation and mitigation, and sustainable development.

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Institute of Soil Science,
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