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# **Eighth Meeting of the International Network of Soil Information Institutions (INSII)**

2-3-4 November 2022 - Virtual (10am-1pm UTC & GMT+0 | 12pm-3pm CET)

## **Agenda Papers (8th Session)**



## Agenda Paper: 2022/I - The New GSP Action Framework

- In May 2022, the 10th GSP Plenary Assembly (PA) adopted the new GSP Action Framework 2022–2030, which was ultimately endorsed by the 28th Session of the FAO Committee on Agriculture (COAG). In this regard, COAG encouraged FAO and all GSP members to implement the activities outlined therein, as well as tools and initiatives of the GSP including the Voluntary Guidelines for Sustainable Soil Management.
- The framework was developed by the OEWG (Annex 5) and was submitted to the 10th GSP PA and the 28th session of the Committee on Agriculture (COAG) for their consideration and endorsement. As it was requested by the 10th GSP PA, a working group is being established to further develop the GSP Action Framework Indicator System.
  - Identifying KPIs and Metrics proposed in the GSP Action Framework (GSP AF);
  - Developing the indicator list, indicator factsheets and the implementation plan;
  - Identifying best practices of integrated data collection and its transfer to GSP Secretariat to assist in the development of SoilSTAT integrated statistical system and data flow among GloSIS, GLOSOB and National Soil Information Systems;
  - Overseeing the development of training materials and strategies to support GSP members and partners in reporting;
  - Proposing strategies for using SoilSTAT and starting a discussion on how the statistical system can help with bridging policymaking and support a more integrated analysis to achieve GSP AF Targets.
- The INSII will be the main technical network as data provider and monitoring the implementation of the new GSP Action Framework. The Global Soil Information System (GloSIS), and the Global Soil Biodiversity Observatory (GLOSOB), will be the main global data platforms to provide soil data and statistics for data driven indicators (3 and 5) sets, whereas SoilSTAT provides official national soil statistics for agreed indicators, following existing UN standards. These statistics are derived from indicators provided by GloSIS and GLOSOB.



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## Action Items

- N/A

## More Information and Reference Documents:

- [Global Soil Partnership Action Framework 2022-2030](#)
- [Report of the 2th Session of COAG](#)
- [Report of the 10th GSP PA](#)



## Agenda Paper: 2022/II -The Year Behind (Q4 2021-Q4 2022)

- The efforts made by the INSII in developing soil data products, raising awareness on data-driven and evidence-based decision-making, as well as in improving national capacities in digital mapping and modelling of soil properties were acknowledged by the 10th PA. The PA also recognised the importance of improving countries' capacities to collect, store, share and use soil information and therefore called on donors to continue to invest in capacity building and development of GloSIS and National Soil Information Systems, especially in developing countries.
- INSII has reached 122 members in the last period. The GSP Secretariat sends regular requests to countries to nominate their national soil information institutions. The following countries are not represented in INSII yet.
  - Andorra, Angola, Antigua and Barbuda, Bahamas, Barbados, Benin, Bolivia, Brunei Darussalam, Burundi, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Croatia, Cyprus, Democratic People's Republic of Korea, Democratic Republic of the Congo, Denmark, Djibouti, Dominica, Dominican Republic, Egypt, Equatorial Guinea, Faroe Islands, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Iceland, Ireland, Kiribati, Kuwait, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Micronesia, Monaco, Mozambique, Nauru, Niue, Oman, Palau, Papua New Guinea, Qatar, Romania, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Samoa, San Marino, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Somalia, South Sudan, Spain, Suriname, Tanzania, Timor-Leste, Tonga, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, Vanuatu.
- Several key documents have been published since the last INSII session. These include Country Guidelines, Technical Specifications, Technical Reports, Leaflets.
  - GSOCseq Technical Report v1.1
  - GSOCseq Brochure
  - GSNmap Country Guidelines and Technical Specifications
  - GSOCmap Technical Report v1.6
  - GBSmap Brochure



- GSASmap Brochure
- 3 Global Datasets have been released (Q4 2021 - Q4 2022)
  - GSOCseq v1.1 - Global Soil organic Carbon Sequestration Potential Map
  - GSASmap v1.0 - Global Salt Affected Soils Map
  - GBSmap v1.0 (INBS) - Global Black Soil Distribution Map
  - GSOCmap v1.6 (update)
- Two country driven global datasets were kick started (GSNmap and GSERmap);
- 11 Training Sessions have been organised;
  - GSNmap Training (Latin America)
  - GSASmap Trainings (Regional and National)
  - DSM Trainings (Regional and National)
  - Soil Data Management Trainings (Regional and National)
- GloSIS Discovery Hub is being moved under FAO domain and will be available soon at <https://data.fao.org/GloSIS/>;
- GSP Secretariat is working on the National Soil Information System Template which will be developed and released in 2023;
- 21 National Soil Information Systems are in the pipeline to be established during 2023 (Asia -12-, The Caribbean - 8- , Africa -1 (Liberia)-);
- Work on SiSLAC has started, The SiSLAC dB and the system will be updated in the first months of 2023.

#### Action Items

- N/A



## Agenda Paper: 2022/III - Capacity Development Programme

- The capacity development programme has been the driving force for developing data products, systems and bridging the digital gap between countries and regions.
- To date, the Soil Information and Data (SID) Capacity Development Programme has reached more than 1300 experts from 120 countries.
- In the last period (Q4 2021 - Q4 2022), 11 training workshops (regional, national) have been organised for more than 35 countries from Asia, Africa, NENA, Eurasia and Latin America.
- The trainings covered a wide range of topics including digital soil mapping, sequestration modelling, soil data management, cloud computing (GEE)
- An online course on digital soil mapping was prepared as a contribution to the GSPs EduSOILS Programme. The 6 hours online course consists of 9 video tutorials. The SID team is currently working on the translation of the content in 6 UN and several other languages including Italian and Turkish. The objectives of the course are:
  - Provide an easy to follow step-by-step video tutorial for the generation of Soil Organic Carbon (SOC) stocks and clay content maps at the national scale to be used as inputs for the Global Soil Organic Carbon sequestration potential map (GSOCseq);
  - Present methodologies that can be easily downscaled and applied at finer resolutions and sub-national scales (regional to field scale) to meet the needs of a broader audience;
  - Underscore the advantages of R for digital soil mapping and data analysis as well as providing a user-friendly introductory course to the R language
- Two Technical Manuals are being developed and will be published soon;
  - Technical Manual for Global Soil Nutrient and Nutrient Budget Maps (GSNmap) - Phase I;
  - Technical Manual for Global Soil Erosion Map

### Action Items

- N/A



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### More Information and Reference Documents/Links

- [DSM Video Course](#)
- [GSNmap Technical Manual \(online version - draft\)](#)
- Technical Contact: Ms Isabel Luotto ([Isabel.Luotto@fao.org](mailto:Isabel.Luotto@fao.org))



## Agenda Paper: 2022/IV - Country Driven Global Datasets

- To date, INSII has developed 3 datasets and supported the development of 1 thematic dataset
  - GSOCmap (1 map) - Global Soil Organic Carbon Map (Latest Version: V1.6)
  - GSOCseq (29 maps)- Global Soil organic Carbon Sequestration Potential Map (Latest Version: V1.1)
  - GSASmap (16 maps)- Global Salt Affected Soil Map (Latest Version: v1.1 - ongoing)
  - GBSmap (2 maps)- Global Black Soil Distribution Map (Latest Version: v1.0-INBS)
- 2 country driven global maps in the pipeline
  - GSNmap (20 maps) - Global Soil Nutrient and Nutrient Budget Maps
  - GSERmap (6 maps + erosion factor dB) - Global Soil Erosion Map
- The Global Datasets are distributed under Creative Commons CC BY 4.0 (GSOCmap) and CC BY-NC-SA 3.0 IGO ( GSOCseq, GSASmap, GBSmap).
- The relevant technical documentation (Guidelines, Technical Specifications, Technical Reports, Training Material, Scripts and all kinds of dissemination material) are distributed under CC BY-NC-SA 3.0 IGO as per FAO regulations.
- Global datasets are served via GloSIS Discovery Hub (CKAN + TerriaJS) which is being migrated under FAO Domain. The service will be available in November 2022 at <https://data.fao.org/GloSIS/>.





## Agenda Paper: 2022/V - Global Soil Nutrient and Nutrient Budget Maps (GSNmap)

- The GSNmap development kick started in January 2022. The initiative aims to develop country driven global maps in two Phases;
  - Nutrient maps (macro and micro nutrients) - Phase I
  - Associated soil property maps - Phase I
  - Soil Nutrient Budget Maps - Phase II
- Phase I development started:
  - GSNmap Country Guidelines and Technical Specifications has been published
  - GSNmap Working Group has been established;
    - The Working Group is composed of members from INSII, ITPS and external experts (open call);
    - The working group is technically supporting the development of GSNmap data products/technical documentation.
  - Only 45 countries and the EU have nominated their national GSNmap experts. The regional training sessions will be organised upon reaching the sufficient number of expert nominations.
    - Argentina (ARG), Austria (AUT), Bangladesh (BGD), Belarus (BLR), Bolivia (Plurinational State of) (BOL), Brazil (BRA), Bulgaria (BGR), Chile (CHL), Colombia (COL), Costa Rica (CRI), Djibouti (DJI), Ecuador (ECU), El Salvador (SLV), Eritrea (ERI), European Union (EU), France (FRA), Georgia (GEO), Germany (DEU), Greece (GRC), Guatemala (GTM), Honduras (HND), India (IND), Indonesia (IDN), Italy (ITA), Mexico (MEX), Netherlands (NLD), Nicaragua (NIC), North Macedonia (MKD), Oman (OMN), Pakistan (PAK), Panama (PAN), Paraguay (PRY), Peru (PER), Philippines (PHL), Poland (POL), Russian Federation (RUS), Senegal (SEN), Sierra Leone (SLE), Slovakia (SVK), South Africa (ZAF), State of Palestine (PSE), Tunisia (TUN), Turkey (TUR), Uruguay (URY), Uzbekistan (UZB), Venezuela (Bolivarian Republic of) (VEN), Portugal (PRT) and India (IND).
  - GSNmap Technical Manual (Phase I) is being finalised;



- GSNmap Capacity Development Programme (Phase I) has started with Latin America (24-28 October 2022 - 63 Experts). GSP Secretariat is now finalising the training schedule for other regions.
- The GSNmap Phase II shall start upon the completion of Phase I

#### Action Items

- Expert Nomination is open! Please use this [FORM](#) for the nominations;

#### More Information and Reference Documents/Links

- [Country Guidelines and Technical Specifications For Global Soil Nutrient And Nutrient Budget Maps \(GSNmap\)](#)
- [GSNmap Technical Manual \(online version - draft\)](#)
- Technical Contact: Mr Marcos Angelini ([Marcos.Angelini@fao.org](mailto:Marcos.Angelini@fao.org))



## Agenda Paper: 2022/VI - The Global Soil Erosion Map (GSErmap)

- The GSErmap development was begun in January 2022. The GSErmap initiative aims to develop erosion data products in two phases;
  - Phase I: Erosion database consists of erosion factors (such as erosivity, erodibility, Cfactor, topography and management practices, etc.). The database will be developed from the database of input data requirements.
  - Phase II: Modelling Soil Erosion. Modelling of soil erosion is intended to;
    - develop harmonised and consistent information on soil erosion,;
    - identify management factors affecting soil erosion, particularly in cropland and grassland areas;
    - identify agriculture areas with high erosion potential; and
    - estimate the relative contributions of water, wind and tillage erosion toward total soil erosion.
    - The process will use the developed national erosion database and identified erosion models for water, wind, and tillage erosion.
- GSErmap Phase I development started
  - Final draft of the GSErmap Country Guidelines and Technical Specifications is ready for INSII's review
  - GSErmap Working Group has been established
    - The Working Group is composed of members from INSII, ITPS and external experts (open call, GSER'19 Symposium);
    - The working group is technically supporting the development of GSErmap data products/technical documentation.
- GSErmap Expert Nomination is ongoing. Only 41 countries and the EU have nominated national GSErmap experts. The regional training sessions will be organised upon reaching the sufficient number of expert nominations.
  - Argentina (ARG), Austria (AUT), Bangladesh (BGD), Bolivia (Plurinational State of) (BOL), Brazil (BRA), Bulgaria (BGR), Cabo Verde (CPV), Cameroon (CMR), Chile (CHL), Colombia (COL), Costa Rica (CRI), Ecuador (ECU), European Union (EU),



Finland (FIN), France (FRA), Georgia (GEO), Germany (DEU), Ghana (GHA), Greece (GRC), Indonesia (IDN), Iraq (IRQ), Italy (ITA), Japan (JPN), Jordan (JOR), Latvia (LVA), Mauritius (MUS), Netherlands (NLD), Nigeria (NGA), North Macedonia (MKD), Philippines (PHL), Poland (POL), Senegal (SEN), Sierra Leone (SLE), Slovakia (SVK), South Africa (ZAF), State of Palestine (PSE), Tunisia (TUN), Turkey (TUR), Uruguay (URY), Uzbekistan (UZB), Venezuela (Bolivarian Republic of) (VEN), Portugal (PRT).

### Action Items

- Review by 15 November - GSERmap Country Guidelines and Technical Specifications
  - [Draft GSERmap Guidelines](#) | [Review Sheet](#)
- Expert Nomination for GSERmap is open! Please use this [FORM](#) for the nominations

### More Information and Reference Documents/Links

- [Global Symposium on Soil Erosion: Outcome document](#)
- Technical Contact: Mr Christian Omuto ([Christian.Omuto@fao.org](mailto:Christian.Omuto@fao.org))



## Agenda Paper: 2022/VII - The Global Black Soils Distribution Map (GBSmap)

- In the second workshop of the International Network on Black Soils in 2019, member countries discussed and agreed to develop a Global Black Soil Distribution Map (GBSmap) as per the endorsed definition of black soils.
- A methodology, country guidelines and technical specifications were developed during the last quarter of 2020 and a GBSmap training session was held in December 2020 with 44 participants from INBS countries.
- Argentina, Colombia, Brazil, Uruguay, Mexico, Canada, United States of America, Indonesia, Poland, Ukraine, China, Russian Federation, Bulgaria, and Slovakia contributed to the GBSmap v1.0.
- The map was extended to 32 INBS member countries with Gap filling.
- The results are being used in the Global Status of Black Soils and will be delivered with GBSmap Technical report.
- Together with GSP, the International Network of Black Soils (INBS) is leading this endeavour. In order to know their spatial distribution, we developed a methodology, a technical manual and delivered an international training to assist INBS member countries to map the distribution.
- The GBSmap v1.0-INBS was launched in May 2022;
- The GSP Secretariat has further extended the coverage to global scale (GBSmapv2.0-Global) using a set of predictors and the data provided by the INBS members.
- The GBSmap V2.0-Global datasets, methodology to be discussed by INSII.

### Action Items

- The GBSmap v2.0-Global will be presented during the 8th Working Session for discussion and decision on way forward

### More Information and Reference Documents/Links

- [GBSmap v1.0-INBS Leaflet](#)
- [GBSmap Press Release](#)
- GBSmap V2.0-Global (to be shared during the meeting)



## Agenda Paper: 2022/VIII - Global Soil Organic Carbon Sequestration Potential Map

- Since its launch during the 9th GSP Plenary Assembly in September 2021, the activities linked to the GSOCseq have revolved around supporting officially mandated National Experts in finalising their GSOCseq products to be included in the upcoming GSOCseq v1.2.
  - To date, 20 countries are currently working on national GSOCseq layers.
  - Slovenia successfully submitted its GSOCseq product in February 2022.
- A dedicated GSOCseq working group (WG) has been established. Its first meeting was held on February 18, 2022. The GSOCseq WG was established with the following objectives:
  - Consolidate a way forward for future updates and extensions to the current methodology to be included in the GSOCseq v2.0;
  - Contribute to key publications specifically aimed at representing the GSOCseq in a high impact journal;
  - Explore synergies with other relevant projects and stakeholders
- The GSOCseq Capacity Development programme:
  - Following a country-driven approach the launch of the GSOCseq was made possible through an extensive capacity development program which supported national experts in producing their national GSOCseq layers. The GSOCseq Technical Manual extended through the contribution of the National Experts was published in early 2022.
  - Since September 2021 the GSP Secretariat has organised 2 regional trainings which reached 95 national experts from 26 countries. The regional trainings were followed by individual sessions to support national experts in finalising national GSOCseq layers and were organised under the framework of the AFACI and NENA TCP projects.
- GSOCseq related key publications:
  - The GSOCseq Technical Report after undergoing an extensive round of review by relevant technical networks and experts, was published (date) (pdf; link). The GSOCseq Technical Report is a companion document to the GSOCseq v1.1. It



presents its methodology, the country-driven process, its main findings and way forward.

- The GSOCseq Brochure was published. It provides a user-friendly at glance description of the GSOCseq, including its main objectives, the country-driven process and main findings.
- The zero draft version of the GSOCseq Manuscript is currently undergoing a first round of review by the GSOCseq WG.

#### Action Items

- N/A

#### More Information and Reference Documents/Links

- [GSOCseq Country Guidelines and Technical Specifications](#)
- [GSOCseq Technical Manual](#)
- [GSOCseq Technical Report](#)
- [GSOCseq Brochure](#)



## Agenda Paper: 2022/IX - Global Salt Affected Soils Map (GSASmap)

- The GSASmap v1.0 was launched in 2021 with the contribution of 118 countries. Given that this is a country-driven process, there are countries who did not prepare their maps because of lack of data, capacities or because they do not have SAS. There are two particular regions, EURASIA and Near East and North Africa (NENA) where SAS are dominant. However, most countries in these regions were not able to prepare their maps by the time the GSASmap v1.0 was launched.
- The GSP Secretariat is currently developing gap filling layers for the 1.2 which will have global coverage.
- The v1.2 and the GSASmap Technical Report will be shared with INSII and ITPS for review and endorsement by the end of 2022.

### Action Items

- N/A

### Reference Documentation/Links

- [GSASmap Leaflet](#)
- [GSASmap Country guidelines](#)
- [GSASmap Technical Manual](#)





## Agenda Paper: 2022/X - The global soil pollution map: a joint INSOP-INSII collaboration 2023-2026

The generation of spatial datasets on the distribution of polluted soils and potential sources of pollution is of utmost importance in informed decision making, so that pollution "hot spots" or areas of special concern can be easily identified. There is an urgent need in the creation of the systematic and dynamic global mapping on soil pollution which will guide policymakers on protecting soils, will prevent further pollution by identifying sources and controlling polluter behaviour and will reduce risks to public health and the environment.

A collaboration between the INSOP and INSII networks will work together towards the development of the methodology to map soil pollution/contaminants and identify data gaps at the global level.

This joint task will work on:

- A global collection and build-up of the soil pollution database. The database will be developed from the database of input data requirements
- Develop harmonised and consistent information on soil pollution
- Identification of agricultural areas prone to point-source and diffuse soil pollution
- Methodology development, Technical Guidelines on assessing, mapping and monitoring soil pollution and delivering an international training to assist INSOP and INSII member countries to map the soil pollution in their region and beyond



## Agenda Paper: 2022/XI - GloSIS Development

### GloSIS Discovery Hub

- Global Soil Information System (GloSIS) is being built in a distributed manner to be a federation of national soil information systems.
- Substantial progress has been made since the last INSII Working Session.
  - FAO Division of Digitalization and Informatics (CSI) and GSP Secretariat have started developing the spatial data infrastructure for GloSIS to support and accelerate the implementation of GloSIS activities using the most sophisticated tools available.
  - CKAN will be used as the main data management system and the metadata catalogue for GloSIS Discovery Hub, global datasets and the data harvested from the regional and national soil information systems. CKAN is an open-source DMS (data management system) for powering data hubs and data portals. CKAN makes it easy to publish, share and use data. It powers hundreds of data portals worldwide.
  - TerriaJS, an open-source framework for web-based geospatial catalogue, will be used as GloSIS data browser and viewer.
  - The GloSIS Landing Page, GloSIS Discovery Hub (Metadata Catalogue and Map Service) will be available from November 2022 under FAO Domain ([GloSIS DH](#) and [GloSIS DH data Catalogue](#)).
  - Connecting/Harvesting from selected National Soil Information Systems later in 2022.

### National and Regional Soil Information Systems

- FAO and GSP are currently developing more than 20 National and Regional Soil Information Systems in Asia, the Caribbean and Africa. These systems will be operational during 2023. The following systems will be established/improved in the next period;
  - 12 National and a Regional Soil Information System in Asia (AFACI Project, funded by Asian Food and Agriculture Cooperation Initiative (AFACI) and Korea Rural Development Agency)
  - 8 National and Regional (CarSIS) soil information systems in the Caribbean



- (funded by SOILCARE Project (GEF)).
- Liberian Soil Information System (LibSIS) (FAO Technical Cooperation Programme)
  - Azerbaijan Soil Information System (AzSIS) (FAO UTF Project)
  - SISLAC (Latin America Soil Information System) is being improved (dB) and updated (the system).
  - A Technical Specifications document has been prepared to develop a NSIS template (national soil information system application package). The development will start upon availability of funding.
  - The NSIS application package will be used to deploy NSIS with minimum effort and resources.



## Agenda Paper: 2022/XII - SoilSTAT

- SoilSTAT is the backbone of the Global Soil Partnership's Global Soil Data Infrastructure and the tool for monitoring, reporting and verification of global soil resources. SoilSTAT initiative was kick started in 2018 and a concept note was developed. Limited progress was made until 2021 and the activity was put on hold due to the development of the new GSP Action Framework which aims to establish an indicator system for monitoring the implementation of the GSP Action Framework (2022-2030).
- In May 2022, the 10th GSP Plenary Assembly (PA) adopted the new GSP Action Framework 2022–2030, which was later endorsed by the 28th Session of the FAO Committee on Agriculture (COAG).
- The SoilSTAT will be the main platform for monitoring also the new GSP Action Framework Indicator System will be further developed by an AdHoc working group (GSP AF WG). The GSP AF Working Group will start working from November 2022
- The SoilSTAT will be the main platform to govern the data flow, monitoring and reporting of the indicators and monitoring the progress made in the implementation of this Action Framework. To facilitate this, the existing SoilSTAT concept will be adapted by INSII , amended to include the indicators of this Action Framework.
- SoilSTAT Working Group to be established for further development of SoilSTAT and to adopt the indicator system to be developed by the GSP AF Working Group.

### Action Items

- Join the SoilSTAT Working Group (form will be shared during the meeting)

### Reference Documents/Links

- [GSP Action Framework](#)



## Agenda Paper: 2022/XIII - The New INSII in the new GSP Action Framework

- **GSPs Vision on Soil Information and Data**

- The GSP's 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. The activities linked to Soil Information and Data Activities within the GSP are cross-cutting. The key objective of Soil Information and Data (SID) is to support GSP members in strengthening their data-driven and evidence-based policymaking efforts. To reach this goal, GSP has adopted an all-in-one approach that combines all necessary elements including system and service development, data generation and production, capacity development.
- The INSII's role in the new GSP Action Framework will be crucial. The INSII will be the main technical network as data provider as well as monitoring the implementation of the new GSP Action Framework through SoilSTAT. The Global Soil Information System (GloSIS), and the Global Soil Biodiversity Observatory (GLOSOB), will be the main global data platforms to provide soil data and statistics for data driven indicators (3 and 5) sets, whereas SoilSTAT provides official national soil statistics for agreed indicators, following existing UN standards. These statistics to be derived from indicators provided by GloSIS, NSIS and GLOSOB.

- **The first implementation period and Lessons Learnt (2016-2021)**

- During the first implementation period (2016-2021), the focus shifted gradually from developing global grids of basic soil properties, to country-driven thematic soil data products (GSOCmap, GSSmap, GSOCseq) as per request by the member countries (GSP Plenary) to address a need to have tangible, nationally as well as globally meaningful datasets. In response to this need, GSP has established a full-fledged country-driven process. Through the extensive outreach of the GSP members and partners, the country-driven process aims at bridging the global technical divide by bringing together top experts in the field and participating



data-holding institutions interested in building local capacities. At the core of this approach is the need to address extremely diverse and regional soil dynamics by fostering and leveraging not only local data but also expertise.

- The shift to global thematic soil data products was further exacerbated by the significant buy-in of the GSP donors. As they address pressing issues that require information on the status and trends of soil threats to enable data-driven decision making by policy makers.
- INSII (International Network of Soil Information Institutions) is the main implementation and decision-making body of Soil Information and Data (SID). During the first implementation period, INSII was extended gradually and reached 118 members. The network is responsible for steering the entire implementation process by making recommendations and decisions, monitoring the progress, building national soil information systems, and producing national data products. Within the first period, INSII has been strengthened through an extensive capacity development program aimed at improving and developing technical capacities in soil data handling, data science, digital soil mapping and modelling.
- The Pillar 4 Working Group was envisioned to be the executive body of the INSII. However, its contribution remained limited due to lack of funding and specialised expertise. Therefore, the GSP Secretariat, as facilitator, was compelled to rely on additional expertise for developing product guidelines, technical manuals and specific tools/codes.

- **Vision for the period 2022 - 2030**

- Over the next ten years, GSP will continue to make systemic and cultural changes to fully realise the value of data assets, to establish an evidence-base to underpin soil research, policy-making, programs and services to improve outcomes for all INSII members.
- INSII should be strengthened as its role is cross-cutting function in supporting data-driven, evidence-based policymaking with FAIR (findable, accessible, interoperable, reusable) data and information for sustainable soil management and, to ultimately achieve the Sustainable Development Goals.



To implement the vision, the following goals, objectives and activities are set out;

○ **Goals**

- To support INSII in developing actionable soil information, purely country-driven global assessments, products and systems (in accordance with international standards) that support decision making for sustainable soil management, which is instrumental for the implementation of the GSP Action Framework;
- To make the soil information and data accessible, interoperable and harmonised at national, regional and global level to facilitate environmental assessments.
- To provide a robust data-driven framework for monitoring GSP Action Framework indicators and targets

○ **Objectives**

- Establish a simplified delivery-based governance and in-house technical coordination with stronger and consolidated collaboration with external stakeholders;
- Strengthen and extend the capacity-building program to continue supporting INSII in developing national soil information systems, national and country-driven global datasets and to increase INSII's capacity to support and promote data driven policy making at national, regional and global level;
- Building a robust framework for further development GloSIS, the GloSIS Discovery Hub and dynamic National Soil Information systems (NSIS) and ensure their interoperability with other systems such as the Global Soil Biodiversity Observatory (GLOSOB) and seamless data flow among NSISs, GloSIS, GLOSOB, SoilSTAT, GLOSOLAN;



- Supporting countries in standardising and serving their data and metadata according to international standards and make these systems part of the GloSIS Federation;
- Positioning GSP and INSII members globally and nationally as highly competent institutions in data generation, data analysis and management.

- **Main Activities**

- Strengthening and extending the Capacity Development Program;
  - The capacity development program will cover the entire workflow of soil data acquisition, harmonisation, storage, analyses, mapping, serving. It will include training on national soil information systems development.
  - EduSOILS platform will be an online learning platform that will include all the necessary learning material, such as training material, cookbooks for thematic maps, product oriented (specific data products) and generic courses (soil data management, mapping and modelling).
- Development of GloSIS Discovery Hub and connected services;
  - The GloSIS Discovery Hub will be made operational at FAO. The hub will allow end users to search and access data hosted through all connected national soil information systems.
- Development of National Soil Information Systems;
  - Activities 2 and 3 are to develop GloSIS, National Soil Information Systems (NSISs) and SoilSTAT with participation of the national institutions. INSII members will be supported to take steps necessary to build fully operational soil information systems.
  - In general the following steps will be taken. (1) Identification of necessary steps (technical requirements and capacity building), (2) Organization of existing soil data and information according to standards, (3) Uploading and serving of the existing data, maps and statistics and deploying





NSIS/RSIS, (4) Work Plan for maintenance and further development of NSIS, GloSIS and SoilSTAT.

- Development of country-driven global datasets (Thematic Maps and Global Grids of Basic Soil Properties);
  - Depending on the nature of the theme of the year, country-driven global products will be produced. Global data products will be compilation of the national products, combined with gap filling using global data sources. The nature of the global product depends on the selected theme and will be decided upon when the theme is selected. The development process for country driven data products will be supported by global capacity development campaigns.
- GloSIS Decision Support Systems (Global, National);
  - Global Soil Decision Support Systems (GloSIS-DSS) as an extension to GloSIS and NSISs will be developed. The system will be using existing global products developed by the GSP (e.g GSOCmap, GSASmap, GSOCseq) and relevant auxiliary data with the ultimate goal of providing end users with insight into their critical decision-making process.
  - INSII members will be encouraged and supported to develop their own decision support systems.

- **Governance**

- The governance will be simplified and consolidated. A process and delivery based governance will be adopted which will enable countries with a lightweight, effective way to produce and develop their databases, datasets, services and systems. Thus, all country driven products and systems will be 1) built according to best practices and 2) adhere to program-specific requirements and standards designed by ad-hoc working and expert groups. 3) overseen and implemented by INSII



- Process and delivery based governance will provide the standards, specifications and process alignment needed to develop quality products, systems, timely, quickly and efficiently.
- **The GSP PA and the ITPS**
  - Each year the GSP has a specific theme on a specific soil function or soil threat, such as salinity, soil erosion, or carbon sequestration potential. This usually entails a set of data product development (e.g. GSOCmap, GSASmap, GSOCseq, GSERmap, GSNmap, GBSmap). Selection of the theme of the year will be done by the GSP Plenary Assembly. Special attention will be given to the theme of the year in the capacity building program to develop relevant data products. The PA may request INSII to address other specific global or regional issues.
  - Product planning for the thematic year will be performed by the secretariat, necessary steps will be taken by INSII, supported by technical thematic working groups, and the process will be scientifically and technically overseen by the ITPS and INSII.
- **International Network of Soil Information Institutions (INSII)**
  - The INSII remains as the main implementation and steering body for the activities to be performed under soil information and data area of work. It will be supported by thematic working groups and specialised experts for highly specialised tasks such as the development of technical specifications and guidelines, tools for the development of GloSIS, National Soil Information Systems (NSIS) and GloSIS data products. INSII will be implementing activities through agreed biennial work plans.
- **Thematic Working Groups**
  - In the first implementation plan, the Pillar 4 Working Group (P4WG) was envisioned to be the technical executive body of the INSII by executing the tasks given by INSII. However, its contribution had remained limited due to lack of funding and human resources, and complexity of the technical



tasks which needed specific expertise from outside of the working group. In the next phase, for highly specialised tasks, the P4WG's role will be taken over by thematic INSII working groups, which will be enforced by external individual experts.

- These working groups will be established on product and activity basis and composed of experts from INSII, ITPS and experts who respond to open calls for specific expertise (e.g. GloSIS Working Group; GSOCseq/GSERmap Working Group, National Soil Archives Working Group). These working groups will perform technical tasks given by INSII. During the last period 3 Thematic Working Groups have been established and contributing to the GSOCseq, GSERmap and GSNmap development.
- **GloSIS System Development, Coordination and Maintenance**
  - During the last years, the technical and technological capacity at FAO and GSP Secretariat has been significantly increased. FAO and GSP are now able to develop fast in-house and complete solutions with the NSL Geospatial Unit and Hand-in-Hand initiative and FAO Digitalization and Informatics Division (CSI). The FAO CSI division defines FAO IT policies, strategy, architecture and standards and monitors organisational compliance and the mechanisms for managing FAO's information and data, avoiding duplication and ensuring security.
  - FAO Division of Digitalization and Informatics (CSI) and the Hand in Hand Initiative (HiH) have started developing a spatial data infrastructure for GloSIS to support and accelerate the implementation of GloSIS activities using the most sophisticated tools available, including advanced geo-spatial modelling and analytics.
  - Considering the existing technical and technological capacity at FAO, hosting GloSIS components (GSP's country-driven global maps, GloSIS Discovery Hub), SoilSTAT will be maintained and hosted by the GSP Secretariat and Digitalization and Informatics (CSI) Division of FAO. GloSIS coordination, management and maintenance will be carried out by the



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GSP Secretariat, and relevant FAO divisions. The further development of the GloSIS SDI, SoilSTAT will be supported by the thematic working groups to be established by INSII.



## 2022/XIV - INSII Biennial Work Plan (2022-XII)

The Following Activities are foreseen for the period of 2022-2024

### - **GSNmap - 2022-2023**

- Review, QA/QC, Expert Nominations, Endorsement, Production, (2022 - 2023) - INSII
- Final Endorsement (2023) - ITPS
- Methodology (2022) - GSNmap Working Group
- Facilitation, Capacity Development, Dissemination, (2022-2023) - GSP Secretariat

### - **GSERmap - 2022-2023**

- Review, QA/QC, Expert Nominations, Endorsement, Production, (2022 - 2023) - INSII
- Final Endorsement, (2023) - ITPS
- Methodology, (2022) - GSERmap Working Group
- Facilitation, Capacity Development, Dissemination, (2022-2023) - GSP Secretariat

### - **SoilSTAT - 2023 - 2024**

- GSP Action Framework Indicator System - GSP AF Working Group
- Finalising the SoilSTAT Concept Note and the SoilSTAT Guidebook, (2022-2023) - SoilSTAT Working Group
- Development of Indicator Factsheets, (2022) - SoilSTAT Working Group
- Concept for the SoilSTAT Platform, (2022) - SoilSTAT Working Group
- Platform Development, (2022-2023) - GSP Secretariat, FAO CSI

### - **GloSIS - 2022 - 2024**

- NSIS Application Package, (2022) - GSP Secretariat
- GloSIS DH, (2022 - 2024) - GSP Secretariat
- NSIS and RSIS Development, (2022-2024) - INSII Members
- Technical Support, Documentation, (2022-2024) - GloSIS Working Group

### - **Capacity Development Programme**

- Development of Training Material, (2022 - 2024) - *Relevant Working Groups (e.g. GSNmap WG, GSOCseq WG)*



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- Technical Material (scripts, manuals), (2022 - 2024) - *Relevant Working Groups*