Food and Agriculture Organization of the United Nations

PILLAR 5 : HARMONIZATION OF METHODS, MEASUREMENTS AND INDICATOR FOR THE SUSTAINABLE MANAGEMENT AND PROTECTION OF SOIL RESOURCES

REPORT 2020/2021

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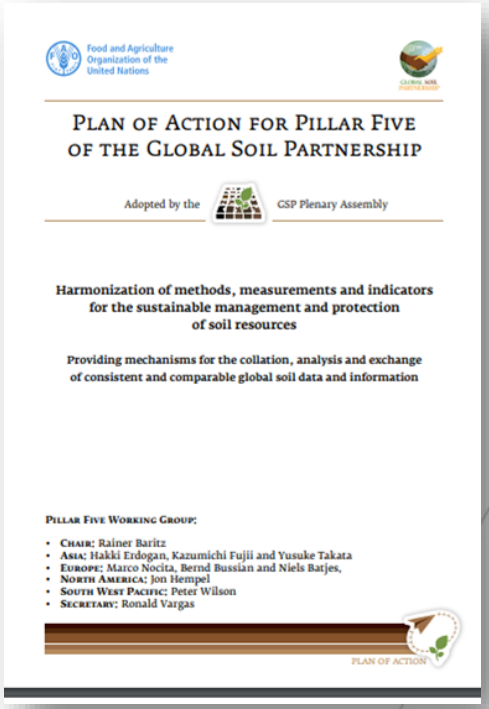
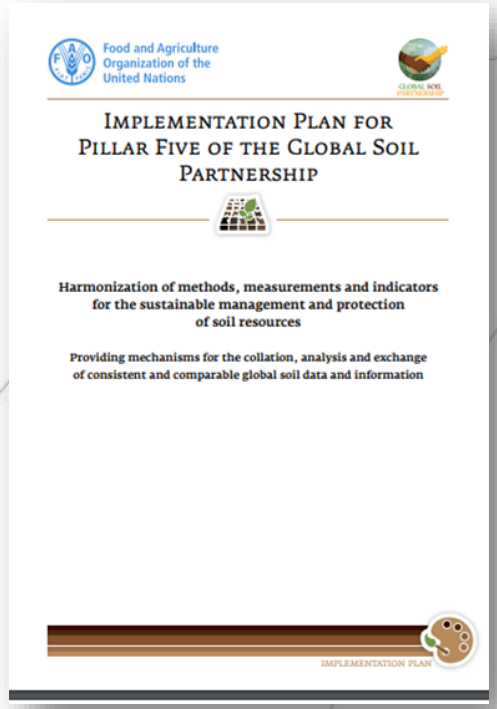
ESP Plenary – June 2021

EUROPEAN SOIL PARTNERSHIP

The Pilar 5 main objective is to develop an over-arching mechanism for globally consistent and comparable harmonized monitoring for soil related policies.





This mechanism includes the following working areas :

- **Soil profile observation and description**, soil classification systems (WRB working group)
  - *The automated WRB classification on going*
  - *The FAO Guidelines for Soil Description (4th edition) is in preparation. It will be ready next year.*
  - *Universal Soil Classification*

- **Standardization of soil mapping and property estimation (Pilar 4)**

- **Soil Iinformation Exchange + Quality of Soil Data**
  - Experinces ISO 28258:2013, INSPIRE
  - SoilML in progress (ISRIC)

- **Soil data interpretation**: agreed and representative indicators set and evaluation functions to assess the impact and performance of the policies, projects and investments on soil. (Pilar 1)

- **Laboratory and field analytical data of soil (RESOLAN)**

Highlights ESP IPoA

- Policy processes require indicators derived from national soil data (e.g. SDG).
- Applying harmonized indicators, using agreed and harmonized evaluation methods are the fundamental basis.
- This is also needed to build a European soil monitoring system based on national systems.

	Recommendation / actions	Description of outputs	Partners	Timeline	Bughet and Funding
1	Revision of the European soil mapping guideline (see also Pillar 4, action 5)	– Revise the ESBN Manual of Procedures – Integrate options to use remote sensing and digital soil mapping (e.g.eSOTER project) – Refine the nested system (see GS Soil project) – Develop a European soil map legend (using the soil regions concept) based on WRB	ESP-INSII ad-hoc WG soil mapping	end 2018	In-kind
2	Soil profile description standard	– will be covered by the global Pillar 5 Implementation Plan (P5IP)	global INSII		In-kind
3	Soil classification: WRB	– For status as of 2012: see GS Soil – Improve national correlation methods – Document challenges and solutions	ESP-INSII	2017/ 2020	In-kind
4	Reference laboratories	– Establish Europe-wide network of soil laboratories building on existing initiatives (e.g. European Union Reference Laboratories EURL, EU Biosoil project) – Selection and establishing a leading laboratory, which implements the web site, produces and distributes reference material, build a data base for calibration and QA, ring tests, evaluations and reporting – see also global P5IP	ESP-INSII/NRC Soil, WG Soil Analysis	2018-2020	Lead laboratory: € 350,000
5	Best practice soil analysis	– Interact with global level INSII P5 for developing best practice recommendations and procedures for soil sampling, storage, analysis – Liaise with ISO TC 190 and CEN	ESP-INSII/NRC Soil, WG Soil Analysis, lead laboratory	2018/ 2019	In-kind
6	Soil Information model	– Analyse the implementation status for interoperable soil data according to INSPIRE, and the degree of harmonization – Develop concept to address coordination needs – ESP INSII members to test the model, and to define and implement use cases – Liaising with networks according global P5IP: GODAN Soil Data WG	ESDAC and ETC ULS ESP INSII	2018	In-kind
7	Indicators	– Develop a soil indicator concept about the state and response of soils under the effect of policies, management and climate change (incl. discussion and feedback with EUR-INSII) – Build on EEA and FP6-ENVASSO indicators – Identify research needs to propose to Pillar 3	ETC ULS and EIONET NRC Soil	2017/ 2018	In-kind

LINK WITH PILLAR 4

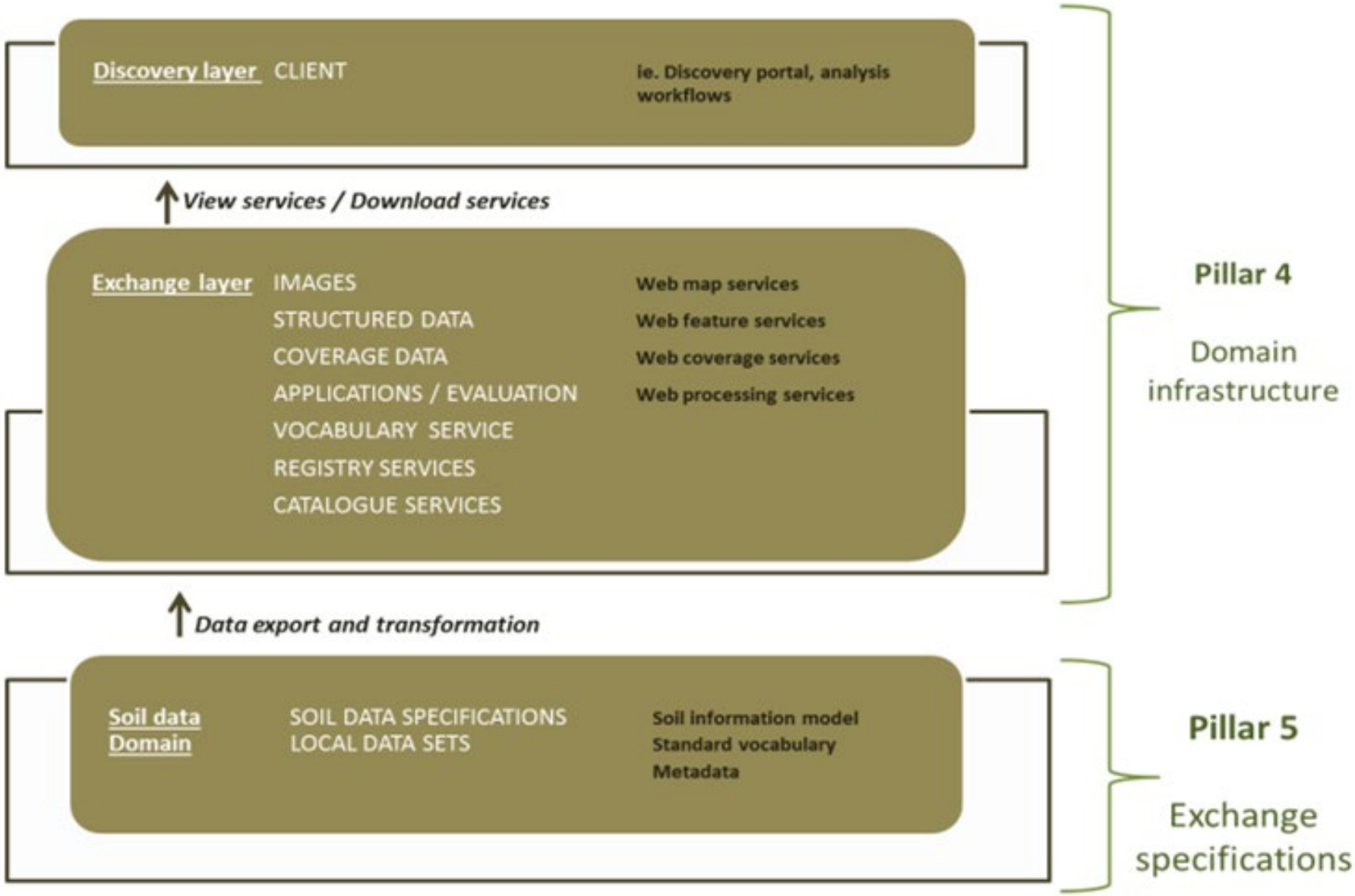


Figure 5: Overview of information model driven system architecture[6]

European and Eurasian Soil Laboratory Network (EUROSOLAN)

The European and Eurasian Soil Laboratory Network (EUROSOLAN) was established through an inception meeting on 2-5 October 2019 in Chişinău, Moldova. The network aims to connect partners and networks already operating within the European and Eurasian region. Laboratories in EUROSOLAN meet yearly to revise their work plan and position within GLOSOLAN.

Countries in EUROSOLAN

Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kosovo, Kyrgystan, Latvia, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, The Republic of Moldova, Turkey, Turkmenistan, Ukraine, United Kingdom, Uzbekistan, Vatican City.

Governance : Activities in EUROSOLAN are coordinated by the Chair with the support of the vice-Chair.
2019-2021
Chair: Mr. Giorgi Ghambashidze, Georgia
Vice-Chair: Ms. Špela Velikonja-Bolta, Slovenia

2nd EUROSOLAN meeting

Due to COVID-19, the second meeting of the Eurasian and European Soil Laboratory Network (EUROSOLAN) was organized virtually using the Zoom Video Communications© platform.

The meeting lasted four hours per day from 30 September to 2 October 2020

It was attended by 78 participants from 26 Eurasian and European countries (Austria, Belgium, Croatia, Czech Republic, Estonia, Georgia, Germany, Hungary, Israel, Italy, Kosovo, Latvia, Netherlands, Portugal, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Spain, Switzerland, The Former Yugoslav Republic of Macedonia, Turkey, United Kingdom, Ukraine and Uzbekistan)

http://www.fao.org/global-soil-partnership/glosolan/regional-soil-laboratory-networks/eurosolan/presentations-eurosolan-october-2020/en/

2nd EUROSOLAN meeting- Highlights

External quality control (or proficiency testing - PT); This training session took place on 30 September. Great attention was paid to the actions taken by the laboratories that participated in the GLOSOLAN PT 2019 to improve their performance.

the participants actively discussed the main challenges related to the success of a PT as;

- The importance for laboratories participating in a PT to use the same standard operating procedures
- The need to develop ad-hoc projects to improve cooperation among laboratories participating in a PT
- The need to organize other global PTs to better assess the proficiency of laboratories in soil analysis and to develop strategies to improve their performances.
- The challenge of finding a provider of reference sample material. In this regard, EUROSOLAN proposed to establish a working group on certified reference sample material.
- The issue of sampling errors (and other types of systematic errors) which are a much more important source of error than laboratory procedures

Proposed to prepare a list of the analysis performed by each laboratory routinely with the corresponding methodology. This list can be used to identify laboratories using the same analytical methods, which can exchange in-house QC standards. This procedure can be implemented at national, regional and global level and allow laboratories to have more confidence in the results of their QC samples. In addition, it might serve to encourage laboratories to organize PTs independently

2nd EUROSOLAN meeting- Highlights

National Soil Laboratory Networks (NASOLAN) for;

1. Enabling all soil laboratories in the same country to interact with each others.
2. Promoting the harmonization processes of soil analysis at the national level;
3. Facilitate the transfer of knowledge acquired by laboratories participating in GLOSOLAN activities at the national level.

The main obstacles to the establishment of NASOLANs in the European and Eurasian region are related to:

- *Communication challenges*: exchange of soil samples and the organization of trainings and meetings may be an issue.
- *COVID-19:* it has seriously affected the establishment of national networks since many countries have planned their first NASOLAN meeting in 2020
- *Availability of financial resources:* it represents a common challenge since all activities implemented at the national level have a cost. In this regard, it was suggested to seek donors and projects
- *Agreement on priorities:* it is necessary to develop a NASOLAN work plan and to ensure that all member laboratories coordinate their actions and move in the same direction

In order to support laboratories in establishing their NASOLAN, GLOSOLAN has prepared Terms of Reference and guidelines on how to establish a NASOLAN. The national reference laboratories play a key role in establishing and enlarging their NASOLAN, and in implementing NASOLAN's work plans (see the Terms of Reference of soil laboratories in GLOSOLAN).

2nd EUROSOLAN meeting- Highlights

Laboratory equipment purchasing, use and maintenance; AFRILAB opened the training session on soil laboratory equipment by presenting GLOSOLAN's good practices on purchasing and operating laboratory equipment.

Harmonization of standard operating procedures (SOPs); laboratories in EUROSOLAN can contribute greatly to the harmonization of GLOSOLAN SOPs and laboratory data, because of their high proficiency and competence in soil analysis.

Position of EUROSOLAN in GLOSOLAN;

- The need to review FAO Soils Bulletin 74 – "Guidelines for Quality Management in Soil and Plant Laboratories". Thirty-eight percent of participants declared that they were not aware of this document. About 40 percent of participants who were aware of this document stated that they do not use it in their laboratory routine because it contains good information, but it is outdated.

- The SOPs GLOSOLAN should work towards harmonization in 2020-2021, which was followed by the identification of regional leaders

2020-2021 (EUROSOLAN)	Regional leader
• Total elements (this includes HM and micro- and macronutrients) by hydrofluoric acid / nitric acid / perchloric acid, and XRF • Quasi-total elements by digestion using aqua regia, HNO3/H2O2 (AAS, ICP-MS, ICP-OES) • Microbial biomass C and N by chloroform fumigation-extraction • exchangable bases and CEC by ammonium acetate, by cobalhexammine methods, and by BaCl2 • Available micronutrients (Fe Zn Cu Mn Mo) – extraction using DTPA and EDTA • Soil moisture - gravimetric • Available phosphate by Troug method	- total elements incl HF/HNO3/HCl: Kristof (VITO – Belgium) and Michael Watts (UK) - total elements by XRF: Beata (NL) - Quasi total elements aqua regia: Giorgi (Georgia) - Quasi total elements HNO3/H2O2: Giorgi (Georgia) - CEC cobalthexamine and exchangeable bases: Beata (NL) and Alan (Portugal) - Available micronutrients: Olena (Ukraine) and Luris (Latvia) - Moisture: Spela (Slovenia) - Microbial biomass C and N by chloroform fumigation-extraction: Can (Turkey) and Joao (Portugal) - Available phosphate by Troug method: Valmire (Latvia)

2nd EUROSOLAN meeting- Conclusions

- Anyone who is interested and has the capacity to prepare large amounts of homogeneous soil samples could become a PT samples provider for GLOSOLAN (consult the GLOSOLAN materials on this topic).

- Participants were invited to review the material to be discussed and endorsed at the fourth GLOSOLAN meeting (11-13 November 2020) and to contribute to the development of their NASOLAN webpages.

- Participants should pay special attention to reviewing their country profiles in the “global assessment on soil laboratories capacities and needs 2020”.

- The launch meeting of the International Network on Fertilizers Analysis (INFA) will take place in December 2020. All laboratories performing or interested wishing to perform soil fertilizers analysis are invited to join this GLOSOLAN sub-network and contribute to the implementation of its work plan

 # Joint workshop between EUROSOLAN and EJP soil

Thank you for your attenion

We need your collaboration !