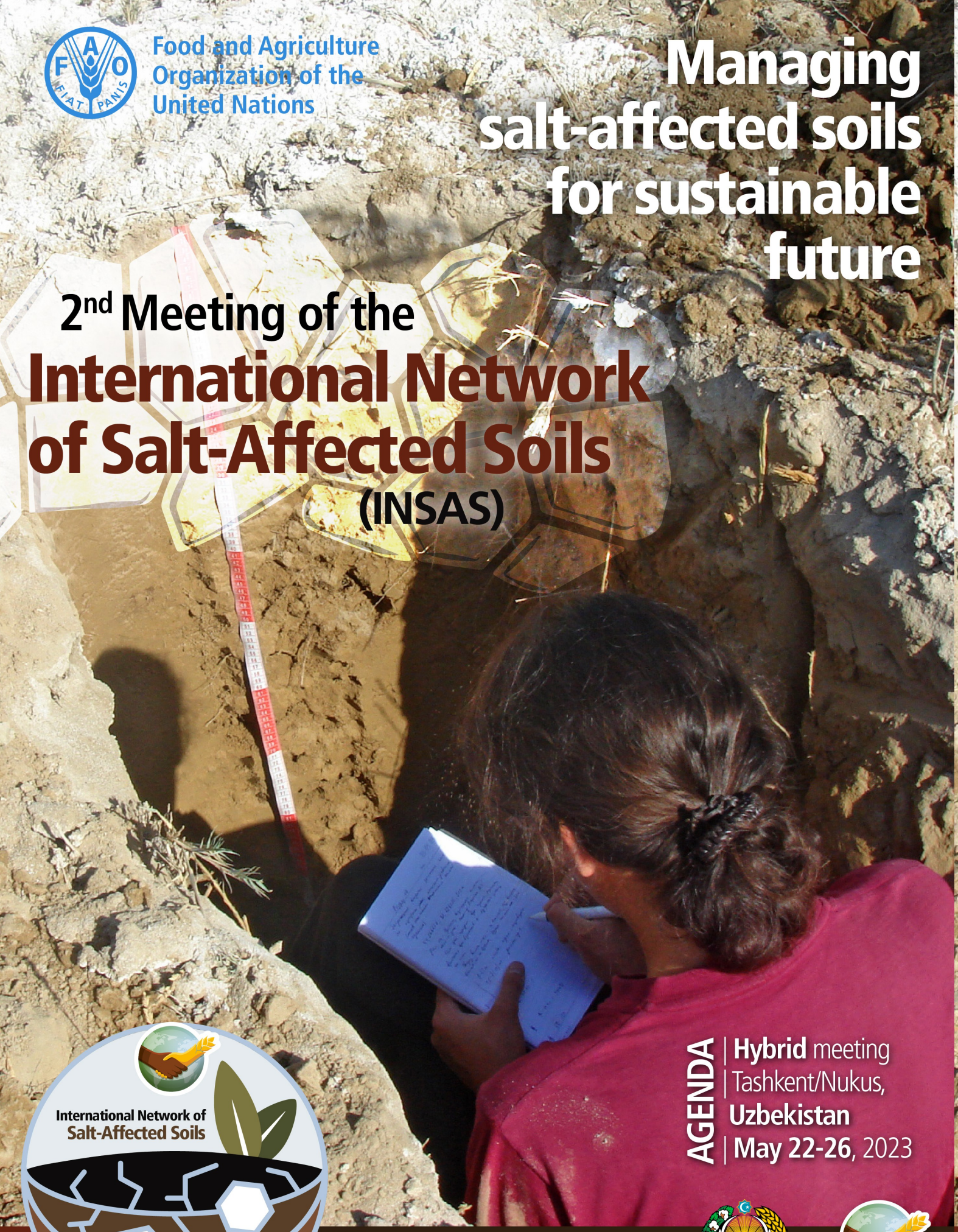
Food and Agriculture Organization of the United Nations

Managing salt-affected soils for sustainable future

2nd Meeting of the International Network of Salt-Affected Soils (INSAS)



AGENDA | **Hybrid** meeting | Tashkent/Nukus, **Uzbekistan** | **May 22-26**, 2023

International Network of Salt-Affected Soils

Government of the Republic of Uzbekistan

GLOBAL SOIL PARTNERSHIP

GLOSOLAN

GLOBAL SOIL LABORATORY NETWORK

The second plenary meeting of the International Network of Salt-Affected Soils and the training of the Global Soil Laboratory Network on salt-affected soil analysis

Tashkent/Nukus, 22-26 May 2023

Registration link for online participants:
May 22 — https://fao.zoom.us/webinar/register/WN_d8b4xso3SB68foUqfpFjyQ
May 23-24 — https://fao.zoom.us/meeting/register/tJUrfuGsrj8vGN1IF6q76KPlITN6zzviUXBt

Background. The Global Soil Partnership (GSP), the sub-regional Eurasian Soil Partnership (EASP) and the FAO country office in Uzbekistan are jointly organizing three parallel meetings: the Sixth EASP Plenary Meeting (open to EASP focal points, partners and Secretariat only), Second meeting of the International Network of Salt-Affected Soils (INSAS); and the training of the Global Soil Laboratory Network (GLOSOLAN) on salt-affected soil analysis in Tashkent, Uzbekistan.

The purpose of the **Second meeting of INSAS** will be to review the progress done by the network in the past two years (2021-2022) since INSAS' first virtual meeting, discuss and identify the priorities for the network, develop the work plan for 2023-2024, strengthen the cooperation between the members of INSAS, improve capacities of the members by trainings. The meeting will include: (1) the workshop on salt-affected soils where the call for abstracts will be opened to all interested researchers/practitioners; (2) the technical sessions of working groups of INSAS on Assessment, Sustainable soil management, Water and Crops where the members of INSAS are expected to participate; (3) side events; (4) INSAS trainings on salt-affected soils (modeling solute transport in salt-affected soils; governance targeted at sustainable management of salt affected lands; mapping soil salinity with electromagnetic induction at the farm scale); (5) GLOSOLAN training in the laboratory.

Venue: City Palace Hotel, Amir Temur st., 15 Tashkent, Uzbekistan
Venue for laboratory training: Soil composition and repository, quality analysis center, Chapanata St., Tashkent, Uzbekistan

Day	INSAS	GLOSOLAN	EASP
May 22	International workshop on salt-affected soils: MANAGING SALT-AFFECTED SOILS FOR SUSTAINABLE FUTURE		
May 23	Technical sessions of INSAS	Technical session of GLOSOLAN and trainings in the laboratory	Review of the progress done by the EASP
May 24	INSAS trainings		Projects and funding opportunities, renewal of EASP
May 25	Field trip to the former Aral Sea (Muynak): Salt-affected soils management and restoration		
May 26	Field trip to the test plot (Karabuga): Salt-affected soils management and restoration		

May 22 **Venue: City Palace, Tashkent, Uzbekistan**	
8:00 – 9:00	Registration
Session 1: Opening of the Workshop **Moderator: Ms Natalia Rodriguez, FAO/GSP**	
9:00 – 09:30	**WELCOME AND OPENING REMARKS** Representative from the Ministry of Agriculture (tbc) Representative of the World Bank (tbc) **Mr Sherzod Umarov**, FAO Uzbekistan **Ms Natalia Rodriguez Eugenio**, FAO Global Soil Partnership Representative of JICA/JST (tbc) **Mr Jorge Batlle-Sales**, Chair of INSAS
9:30 – 11:00	**KEYNOTE PRESENTATIONS** **SATREPS BLUE: Climate resilient approaches for water-use efficiency and halophytic farming in the Aral Sea basin** **Mr Kenji Tanaka,** Kyoto University, Japan; **Ms Kristina Toderich**, Tottori University, Japan **Environmental Impact Assessment of projects on salt affected lands or under risk of salinization** **Mr Jorge Batlle-Sales**, University of Valencia, Spain **Double desalinization approach (DDA) as integrated for salt affected soil management in water shortage region** **Mr Fei Wang,** Northwest A&F University, Institute of Soil and Water Conservation, China **Plantation and utilization of halophytes with saline water irrigation in the Thar Desert of Pakistan** **Ms Bilquees Gul** , University of Karachi, Pakistan **TBC** **Mr Makhmud Shaumarov**, FAO, Kazakhstan
11:00 – 11:30	Coffee break
Session 2: Oral presentations **Moderator: Ms Katarzyna Negacz, Vice-chair of INSAS**	
11:30 – 13:00	**Ecological reclamation of saline-sodic wasteland in China** **Mr Shuwen Hu**, China Agricultural University, China **Estimation of cotton yield and water productivity under saline conditions using SWAP Model** **Mr Yousef Hasheminejhad**, Khorasan Razavi Agricultural and Natural Resources Research and Education Center, Iran **Monitoring salt affected soils by NIR spectroscopy in the Colombian Caribbean banana plantations** **Mr Cristian Rincón**, Universidad Nacional, Colombia

May 22 Venue: City Palace, Tashkent, Uzbekistan	
Session 2: Oral presentations (cont'd)	
11:30 – 13:00	**In-field assessment of soil and water salinity with geophysics and geostatistics** **Ms Larisa Golovko**, Landviser, USA **Putting salt-affected soils on the EU policy agenda** **Mr Pim van Tongeren**, Vrije Universiteit Amsterdam, Netherlands **Adaptation and promotion of climate resilient technologies to improve productivity of salt affected lands based on quasi-real-time monitoring system** **Mr Tolib Mukimov**, Uzbek Research Design Institute (UZGIP), Uzbekistan
13:00 – 13:15	*GROUP PHOTO*
13:15 – 14:15	Lunch
Session 2: Oral presentations (cont'd)	
14:15 – 15:15	**Optimizing leaching practice in saline and sodic soils using modelling approach** **Mr Meisam Rezaei**, Soil and Water Research Institute (SWRI), Agricultural Research, Education and Extension Organization (AREEO), Iran **Exploring farmers' perception, knowledge, and management techniques of salt-affected soils to enhance rice production on small land holdings in Tanzania** **Ms Primitiva Mboyerwa**, Sokoine University of Agriculture, Tanzania **Curbing the salinization of arable land and agronomically restoring salt-affected soils, a food security challenge: assessment and prospects, the case of Senegal in West Africa** **Mr Jean Henri Bienvenue Sene**, Cheikh Anta Diop University, Senegal **Features of the distribution of nematodes on saline sierozem-meadow soils** **Ms Lazizakhon Gafurova**, National University of Uzbekistan, Uzbekistan
15:15 – 16:30	*Session 3: Oral poster session* **Moderator: Ms Maria Konyushkova, FAO/GSP**
16:30 – 17:00	Coffee break
17:00 – 18:30	*Side event FAO/CACILM-2: Managing soil salinization in arable areas of Central Asia: causes, impacts, best practices, and regional cooperation* **Moderator: Mr Makhmud Shaumarov, FAO**

Oral poster session

Physiological and biochemical evaluation of quinoa genotypes against salinity, drought and heat stress
Mr Ghulam Abbas, Centre for Climate Research and Development, COMSATS University Islamabad, Pakistan

Mixed agroforestry systems for saline landscape restoration in Karakalpakstan, Central Asia
Ms Natalya Akinshina, National University of Uzbekistan named after Mirzo Ulugbek, Uzbekistan

Evaluation of the phytodesalination capacity of four halophytes for a saline-sodic soil
Mr Demis Andrade Foronda, Universidad Mayor de San Simón, Bolivia

STCR-IPNS based fertilizer prescriptions for cotton in coastal Karaikal region
Ms Uma Bagavathi, AMMAL PAJANCOA&RI, India

Efficacy of PRIMEO humic-fulvic acid plus chelate micronutrients in pechay
Ms Grace Glend Gabisay, Schools Division of Victorias City, Philippines

Reclamation of saline soil using subsurface drainage system, Golestan region, Iran
Mr Karim Ghorbani, Water and Soil Department, Ministry of agriculture, Tehran, Iran

Impact of soil amendments on salt accumulation in rhizospheric soil and the tolerance of Quinoa to high salinity
Mr Cherki Ghoulam, Cadi Ayyad University, Marrakech / Mohammed VI Polytechnic University, Benguerir, Morocco

Sequenced glutathione and organic biostimulant application reduce accumulation of toxic sodium and detoxification of heavy metal contaminants in wheat under saline soil
Mr Hafeez Hafeez ur Rehman, Department of Agronomy, University of Agriculture Fasialabad, Pakistan

Study of some crops tolerance and phytodesalination potential for sustainable saline agriculture
Ms Anna Harutyunyan, Yerevan State University, Armenia

Integrated soil and water management under saline conditions
Mr Prince Hiama, Central agriculture research institute, Liberia

Synergistic effects of potassium and cultivars to improve rice (Oryza sativa. L) productivity under moderate salinity conditions in Central Vietnam
Ms Hoa Hoàng Thị Thái Hòa, Faculty of Agronomy, University of Agriculture and Forestry, Hue University, Vietnam

The impact of new technology on the biological activity of saline soils and the yield of rice
Ms Mariya Ibrayeva, Kazakh Research Institute of Soil Science and Agrochemistry named after U.U.Uspanov, Kazakhstan

Salinity transformation approach for progress; an integrated approach for salinity, groundwater, soil and agriculture
Mr Md Feroz Islam, Wageningen University and Research, Netherlands

Oral poster session (cont'd)

Health risks and source identification of heavy metal pollution in soil around marble processing plants in Malakand District of Pakistan
Mr Asghar Khan, Islamia Collge Peshawar, Pakistan

Soil salinity and soil structure dynamics under land cover/land use changes in a RAMSAR saline inland wetland : case study- BAZER-SAKRA SABKH, Setif (North-East of Algeria)
Mr Yacine Louadj, Université ferhat abbas sétif, Algeria

The important role of silicon in saline soil
Ms Malika Mamasolieva, National University of Uzbekistan, Uzbekistan

Chenopodium album as a perspective plant for saline soil phytoremediation
Ms Gohar Margaryan, Yerevan State University, Armenia

Biochar application in saline soils to increase wheat germination success in central Mexico
Mr Lenin Medina-Orozco, Tecnologico Nacional de Mexico, Mexico

Iranian soil resource, extent of soil salinity and strategies for saline soil management
Mr Jahanbakhsh Mirzavand, Ministry of Agriculture-Jahad, Deputy of Water & Soil, Iran

Methodological contribution to the mapping of environmental susceptibility to soil salinization in dry regions
Mr Flávio Rodrigues do Nascimento, Federal University of Ceará, Brazil

Soil salinity assessment in the south of the steppe zone of Russia based on multi-temporal high-resolution satellite images
Ms Kristina Prokopyeva, Lomonosov Moscow State University, Russian Federation

The modern state of the halophytic vegetation of the Southern Aral Sea Basin in the destabilised natural environment
Mr Polat Reymov, Karakalpak State University named after Berdak, Uzbekistan

Soil salinity detection and mapping under climate and land cover changes between 2000 and 2022: Sminja case study (Tunisia)
Mr Karem Saad, National Engineering School of Sfax, University of Sfax, Tunisia

Possibilities of enhancing gypsum ameliorative efficiency during chemical reclamation of Soda Solonetz-Solonchaks
Mr Samvel Sahakyan, National University of Architecture and Construction of Armenia, Armenia

Development and calibration of geo-spatial techniques for monitoring of soil salinity in agricultural landscape of Punjab
Mr Zulfiqar Ahmad Saqib, University of Agriculture Faisalabad, Pakistan

Oral poster session (cont'd)

Prospects of rehabilitation of salt affected lands using trees
Mr Muhammad Saqib, Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad, Pakistan

Sustainable management of calcareous sodic soil through combined application of chemical and organic amendments in Bihar, eastern India
Mr Shiveshwar Pratap, SINGH Dr. Rajendra Prasad Central Agricultural University, India

Cropping patterns for the sustainable use of poor quality irrigation water in agriculture
Ms Preeti Singh, ICAR-IARI, Jharkhand, India

Methodological challenges of salinity quantification by electrical conductivity of soil solutions
Mr Andrey Smagin, Lomonosov Moscow State University, ILAN RAS, Russian Federation

Basic agrophysical characteristics of soils in Karakalpakstan
Mr Oralkhon Sultasheva, Karakalpak State University, Uzbekistan

Quality assessment of mine ponds and soil heavy metal levels of two Biafran Villages in the vicinity of active and abandoned lead mines
Mr Augustine Uwanuruochi Uwanuruochi, Investment Limited, Malaysia

Mapping the severity of soil salinization potential in Israel
Mr Elazar Volk, The Soil Erosion Research Station, Dept. of Soil Conservation and Drainage Ministry of Agriculture, Israel

Policy and agronomic practice of sustainable management of salt-affected soils in Ukraine
Ms Ludmila Vorotyntseva, National Scientific Center «Institute for Soil Science and Agrocheistry Research named after O.N. Sokolovsky», Ukraine

Evaluating crop-specific responses to drought and salinity stress from remote sensing
Ms Wen Wen, Institute of Environmental Sciences (CML), Leiden University, Netherlands

Experience of sugar sorghum cultivation on saline soils of rice growing systems in Kyzylorda region
Mr Vladimir Zabolotskyh, Food and Agriculture Organization of the United Nations, Kazakhstan

Salt regime of soils under drip irrigation in orchards of Ukraine
Ms Maryna Zakharova, National Scientific Center «Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky», Ukraine

Changes in the water-soluble salts content in the calcic chernozem under irrigation with brackish waters
Ms Maryna Zakharova, National Scientific Center «Institute for Soil Science and Agrochemistry Research named after O.N. Sokolovsky», Ukraine

May 23 **Venue: City Palace, Tashkent, Uzbekistan**		
Technical session of INSAS **Moderator: Jorge Batlle-Sales**		
9:00 – 9:30	Report on the INSAS work in 2021-2022	Maria Konyushkova, GSP Secretariat
9:30 – 10:30	Planning by Working group 1: SAS&Assessment: Mapping, assessing and monitoring of salt-affected soils	Members of WG1
10:30 – 11:00	Coffee break	
11:00 – 12:00	Planning by Working group 2: SAS&SSM: Sustainable management of salt-affected soils (practices, policy)	Members of WG2
12:00 – 13:15	FAO/SW&FS Partnership: Global Campaign on Salinization	
13:15 – 13:30	GROUP PHOTO	
13:30 – 14:30	Lunch	
14:30 – 15:30	Planning by Working group 3: SAS&Crops: Halophyte agriculture and salt-tolerant crops and plants	Members of WG3
15:30 – 16:30	Planning by Working group 4: SAS&Water: Integrated soil and water management under saline/sodic conditions	Members of WG4
16:30 – 17:00	Summary and finalization of the INSAS' work plan for 2023-2024	all
17:00 – 17:30	Coffee break	
17:30 – 18:00	Summary and finalization of the INSAS' work plan for 2023-2024 (cont'd)	all
18:00 – 18:30	Closing remarks	INSAS Chair

May 24 **Venue: City Palace, Tashkent, Uzbekistan**		
Trainings on salt-affected soils		
8:30 – 10:00	Sustainable management practices: Stakeholder identification and impact	Katarzyna Negacz, INSAS Vice-Chair, IVM Vrije Universiteit Amsterdam, Assistant Professor
10:00 – 11:00	Water flow and solute transport using hydrological models	Meisam Rezaei, INSAS Vice-Chair, Soil and Water Research Institute, Assistant Professor
11:00 – 11:30	Coffee break	
11:30 – 13:00	Water flow and solute transport using hydrological models (cont'd)	Meisam Rezaei, INSAS Vice-Chair, Soil and Water Research Institute, Assistant Professor
13:00 – 13:15	GROUP PHOTO	
13:15 – 14:30	Lunch	
14:30 – 17:00	EM Inversion Modelling for 2-D and 3-D salinity mapping	John Triantafilis, Portfolio Leader Managing Land & Water, Manaaki Whenua – Landcare Research
17:00 – 17:30	Coffee break	
20:00	Departure to Nukus	
May 25 - 26 **Nukus, Uzbekistan**		
7:00 – 22:30	Field trip to former Aral Sea area: Salt-affected soils management and restoration	
23:50	Arrival back to Tashkent	

GLOSOLAN training on the analysis of salt-affected soils

Tashkent, Uzbekistan | May 23, 2023

Venue: Soil composition and repository, quality analysis center, Tashkent, Uzbekistan		
8:30 – 9:00	Registration	
Session 1: Opening of the workshop and GSP overview *Moderator: Magdeline Vlasimsky*		
9:00 – 09:20	Welcome and Opening Remarks	
Session 2: Technical session of the Global Soil Laboratory Network (GLOSOLAN) *Moderator: Magdeline Vlasimsky*		
9:20 – 9:40	Introduction to the Global Soil Laboratory Network (GLOSOLAN)	Ms Miriam Ostinelli, GLOSOLAN Chair (online)
9:40 – 10:00	GLOSOLAN-INSAS collaboration: What we did, what we will do	Ms Magdeline Vlasimsky, GSP
10:10 – 10:30	GLOSOLAN's Standard Operating Procedures (SOPs) on electrical conductivity (EC), pH, saturated soil paste extract, boron by hot water extraction. Questions and answers on GLOSOLAN's SOPs	Mr Elh Moudi Moustapha Abdourahaman, GLOSOLAN vice-Chair
10:30 – 10:50	Coffee break	
10:50 – 11:50	Lecture: Quality control and quality assurance (QA/QC) and participation to proficiency tests: • Common errors • Results submission • How to assess the laboratory performance • Actions to take in case of low performance of the laboratory	Ms Hanane Aroui, Laboratoire des Moyens Analytiques – IRD, Senegal
11:50 – 12:20	Laboratory health and safety	Ms Hanane Aroui, Laboratoire des Moyens Analytiques – IRD, Seneg
12:20 – 12:50	Demonstration of on-site soil tests	

12:50 – 13:00	Group picture	
13:00—14:00	Lunch	
14:00—14:30	Outcomes of the GLOSOLAN PT 2022 Launch of the Eurasian PT How to participate to international proficiency tests	Ms Elena Shamrikova, Komi Scientific Center of the Ural Branch of the Russian Academy of Sciences Ms Magdeline Vlasimsky, GSP Secretariat
Session 3: Training at the Soil lab of Uzbekistan		
14:30 – 15:00	Sample preparation and storage, balance calibration and sieving	Laboratory personnel
15:00 – 15:30	Training on the implementation of the GLOSOLAN SOP on electrical conductivity (EC), video on saturated soil paste extract	Mr Giorgi Ghambashidze, Laboratory of Soil Research named after Prof. Ivane Sarishvili, Scientific-Research Centre of Agriculture (SRCA), Georgia
15:30 – 16:15	Training on the implementation of the GLOSOLAN SOP on soil pH (in H_2O, in KCl, in $CaCl_2$)	
16:15 – 17:00	Training on the implementation of the GLOSOLAN SOP on Boron by hot water extraction / DTPA extraction	
17:00 – 17:30	Coffee break	
17:30—18:30	Training on the measurement of Total Soluble Salts (TSS) and exchangeable sodium percentage (ESP)	Mr Giorgi Ghambashidze, Laboratory of Soil Research named after Prof. Ivane Sarishvili, Scientific-Research Centre of Agriculture (SRCA), Georgia
18:30—19:30	Implementation of procedures by participants	
19:30—20:00	Reflections of the day	

Trainings

Training 1
Sustainable management practices: Stakeholder identification and impact

Trainer: Ms Katarzyna Negacz, INSAS Vice-Chair, IVM Vrije Universiteit Amsterdam, Assistant Professor at the Department of Environmental Policy Analysis

Objectives: Salinisation is one of the major soil degradation processes influencing human livelihoods and food systems. Monitoring of salt-affected soils, sustainable management practices and projects conducted on these soils often involve assessment of socio-economic impacts. Therefore, in this workshop we will show how to identify stakeholders and measure the impact of your practice or project on them, based on the example of cost-benefit analysis. Further, we will discuss how to include socio-economic analysis in your project/study and investigate its viability for further upscaling.

Audience: multi-disciplinary experts and students.

Tentative duration: 1.5 h

After this workshop, the participants will be able to:

- Identify and map the stakeholders involved in your practice / project and assess their influence and interest in the topic
- Conduct cost-benefit analysis taking into account economic, social and environmental values
- Evaluate and assess the viability of your practice/project upscaling taking into account its socio-economic impacts

Training 2
Water flow and solute transport training using hydrological model

Trainer: Meisam Rezaei, INSAS Vice-Chair, Soil and Water Research Institute, Assistant Professor

Objectives: A detailed conceptual and mathematical description of water flow and solute transport processes in the vadose zone and groundwater will be given during the first part of the course. Hands-on computer sessions will then provide participants an opportunity to become familiar with the windows-based HYDRUS computer software packages, including several additional modules, such as the ROSETTA, UNSATCHEM, and Wetlands modules. The training will include:

- Introduction of modeling approach and hydrological models
- Introduction to variably-saturated water flow and solute transport processes (conceptual and mathematical description)
- Review of the hydraulic properties of unsaturated porous media and introduction RETC and ROSETTA to estimate hydraulic properties
- Introduction to HYDRUS-1D software package, its modules and its application for simple one-dimensional problems
- Application of HYDRUS-1D to a water flow and solute transport problem (Case studies from Iran, Belgium and the Netherlands)
- Advanced one-dimensional forward and inverse modeling with HYDRUS-1D (case study of potato field of the Netherlands)
- Application of HYDRUS-1D to modeling salinity using the standard and UNSATCHEM Modules (case study of saline agriculture pilot of Khuzestan, and Sistan Plain, Iran)

Audience: multi-disciplinary experts and students.
Tentative duration: 2.5 h

Laptops are required to perform this training

Minimum System Requirements:

- Operating Systems: Windows 11 (64-bit), or Windows 10 (64-bit), or Windows 8 (64-bit)
- X64 CPU with 2 GHz
- 2 GB RAM
- 10 GB total hard disk capacity with about 500 MB reserved for installation
- Graphic card with a resolution of 1280 x 800 pixels

For further information and to download the model, please visit:
https://www.pc-progress.com/en

Training 3
EM Inversion Modelling for 2-D and 3-D salinity

Trainer: John Triantafilis, Portfolio Leader Managing Land and Water, Manaaki Whenua Landcare Research Aotearoa New Zealand

Objectives: Training will be provided on use of electromagnetic (EM) induction instruments and data to create digital soil maps of soil physical, biological, chemical, and hydrological properties. Focus will be on the use of EM4Soil inversion software to estimate depth specifics and its use to develop 2-d and 3-d inversion models. A hands-on computer session will provide participants an opportunity to become familiar with the EM4Soil computer software package, including the inversion of EM data from EM instruments. The training will include:

- Introduction to theory of operation of electromagnetic (EM) induction instruments and measurement of apparent electrical conductivity (ECa – mS/m)
- Introduction to commercially available EM instruments including Geonics (e.g., EM38, EM31 and EM34) and DUALEM (e.g., DUALEM1, and DUALEM421)
- Introduction to demonstrated case studies in the use of ECa to create digital soil maps of soil physical (e.g., clay, silt and sand), biological (e.g., SOC), chemical (e.g., salinity) and hydrological (e.g., volumetric moisture content)
- Introduction to theory of EM inversion modelling, development of EM4Soil software to invert EC_a data to estimates of depth specific sigma (s – mS/m)
- Demonstrated case studies in the use s to create digital soil maps of soil physical (e.g., clay, silt and sand), chemical (e.g., salinity) and hydrological (e.g., volumetric moisture content) at multiple depths
- Practical demonstration of two-dimensional inverse modeling of EC_a data with EM4Soil (case study of EM38 data along transects to predict salinity)
- Practical demonstration of two-dimensional joint-inverse modeling of EC_a data with EM4Soil (case study of DUALEM-421 and EM34 along transect to predict clay)
- Practical demonstration of three-dimensional inversion modeling of EM38 data with EM4Soil (case study to predict salinity)

Audience: multi-disciplinary experts and students.
Tentative duration: 2.5 h

Laptops are required to perform the inversion modelling and to fill in e-document

Minimum System Requirements:

- Operating Systems: Windows 11 (64-bit), or Windows 10 (64-bit), or Windows 8 (64-bit)
- X64 CPU with 2 GHz
- 2 GB RAM
- 10 GB total hard disk capacity with about 10 MB reserved for installation of demonstration version of EM4Soil software
- Graphic card with a resolution of 1280 x 800 pixels

Field excursion

Salt-affected soils management and restoration

Day 1: Nukus – Muynak – Nukus (~200 km one way)

The field excursion of the first day will include the visit to the My garden in the Aral Sea – the reforestation plot of the International Innovation Center for the Aral Sea basin (IICAS), the Regional History and Aral Sea museum, and Panorama.

6.30 – Departure from the hotel

~10.00 – Arrival in Muynak

10.00 – 11.00 – Visit to the Regional History and Aral Sea museum

11.00 – 12.00 - International Innovation Center for the Aral Sea basin, *My garden in the Aral Sea*

12.00 – 13.00 – Panorama and lunch

13.00 – 14.00 – Trip along the former Aral Sea coast (by bus or on foot, depending on the road trafficability)

14.00 – Departure back to Nukus

~17.00 – Arrival in Nukus

MUYNAK

Former port city on the Aral Sea and the "Cemetery of Ships"

The city of Muynak in the autonomous Republic of Karakalpakstan is the furthest from the capital of Uzbekistan, Tashkent, a small settlement with a population of about 18,000 people. Until the 1980s, Muynak was a prosperous fishing port city on the southern shore of the Aral Sea. Muynak had its own fish cannery, which supplied the whole of Uzbekistan with fish and was among the largest in the entire USSR.

Everything changed in the 1980s, when the sea began to shallow catastrophically fast. Every year the water moved farther away from the city, the fish disappeared, and the moored ships remained standing in the port. They are still here today - the harbor of Muynak has turned into a "Cemetery of ships" in the middle of the bare seabed. The former bottom of the Aral Sea has already become overgrown with saxaul and has turned into a full-fledged Aralkum desert, as if there had never been any water here.

At present, the territory of the **dried bottom of the Aral Sea** is about **6 million ha** of which 3.2 million ha are located on the territory of Uzbekistan, the remaining about 2.8 million ha are on the territory of Kazakhstan. The Western and Southern Aral Sea region belongs to the Republic of Karakalpakstan in the north of Uzbekistan. The Aral Sea region is one of the most significant dust storm sources in Central Asia.

Day 2: Nukus – Halophyte farm in Karabuga – Nukus (~60 km one way)

The field excursion of the second day will include the visit to the SATREPS test plot with halophytes, training on soil salinity mapping with EM-38 and the visit to Savitsky Art Museum.

7.00 – Departure from the hotel

9.00 – Arrival in Karabuga

9.00 – 12.00 – Visit to a halophyte farm

12.00 – Lunch

13.00 – 15.00 – Training with EM-38

15.00 – Departure from Karabuga

17.00 – 19.00 – Visit to the Karakalpak State Art Museum named after I.V. Savitskiy

22.30 – Departure from Nukus to Tashkent (flight)

23.50 – Arrival in Tashkent

The overall premise of this field excursion is that halophytic plants (broadly defined to highly include salt-loving wild species and salt-tolerant crops) can be cultivated to maintain agricultural productivity with food and fodder production potential of saline lands. The technologies and business models for the sustainable saline agriculture on the marginal saline lands are developed based on the concept of Circular Halophytes Mixed Farming (CHMF). A CHMF production system is being performed at Karabuga demonstration site in the Amudarya Delta (Karakalpakstan) in the frame of the Blue Satreps Japan-Uzbekistan project. CHMF focuses on the development and application of a soil-water-plant salinity dynamics model to the stimulation of the cultivation and management options over multiple growing seasons. The field excursion will bring together the international and national experts to discuss the benefits of cultivation of multi-purpose halophytes and cash salt tolerant glycophytes in a mixed farming agriculture system to mitigate soil salinization and improve economic utility of salt-affected agricultural lands.

On-farm showcase study approaches and technical solutions to mitigate and adapt to salinity, considering the increasing soil and groundwater salinization challenges on national basis will be demonstrated. This session is very much relevant to Aral Sea Basin that are severely affected by salinization due to prolonged droughts and rapidly decreasing water and land productivity.

The on-farm training with EM-38 equipment to measure soil salinity will be performed in the field.

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.

Land and Water Division
GSP-secretariat@fao.org
www.fao.org/global-soil-partnership

Food and Agriculture Organization of the United Nations
Rome, Italy

The International Network of Salt-Affected Soils (INSAS), launched in 2019 during the International Center for Biosaline Agriculture's (ICBA) first Global Forum on Innovations for Marginal Environments, is a Technical Network of the Global Soil Partnership (GSP) and follows its Rules of procedure. The Network aims to facilitate the sustainable and productive use of salt-affected soils for current and future generations. INSAS's mission is to support and facilitate joint efforts towards the sustainable management of SAS for food security, agricultural sustainability and climate change mitigation.

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gef

Ministry of Agriculture, Nature and Food Quality of the Netherlands

Korea Green Growth Trust Fund

Ministry of Foreign Affairs of the Russian Federation

BLUE

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

WORLD BANK GROUP