



Food and Agriculture  
Organization of the  
United Nations

# 16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)

## Soil Salinity working group: the last updates

### ITPS:

Khan Mohammad Jamal

Patra Ashok

Attia Rafla

Balks Megan

Chabala Lydia

Hassan Kutaiba

Poch Rosa

### GSP Secretariat:

Konyushkova Maria

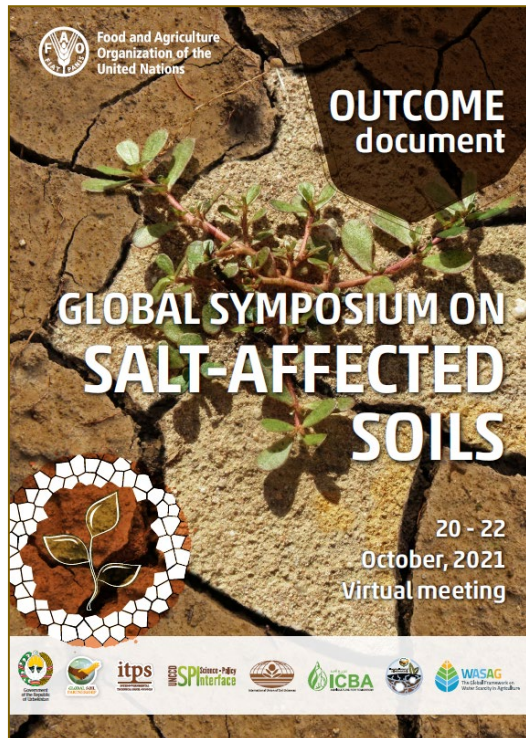
28, 29 and 30 March 2022 | Virtual meeting



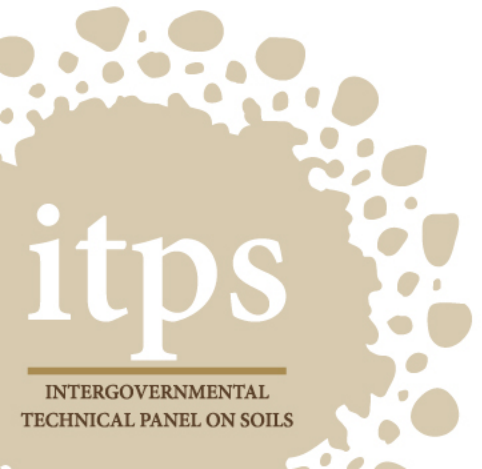


# Salinity Working Group activity between the 15th and the 16th ITPS sessions

- Revision of the GSAS Outcome document
- Revision of the Questionnaire on Salt-Affected Soils



16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting



# Main recommendations of GSAS Symposium

## Theme 1: Assessment, mapping, and monitoring of salt-affected soils

- Recommendation 1: Support the harmonization of the procedures of soil salinity, sodicity and alkalinity **assessment**.
- Recommendation 2: Refine and update the protocols for **mapping** of salt-affected soils using modern approaches.
- Recommendation 3: Promote national and regional programs designed at **monitoring** of salt-affected soils.
- Recommendation 4: Promote the formulation and wider use of **indicators** of soil salinity and sodicity.

## Theme 2. Integrated soil – water – crop solutions for the rehabilitation and management of salt-affected areas

- Recommendation 5: Promote the adoption of **good practices**.
- Recommendation 6: Support the development of **water quality to avert soil salinization and sodification**.

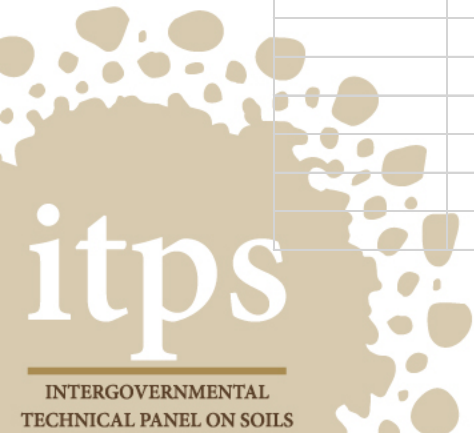
## Theme 3. Agenda for action to prevent and rehabilitate salt-affected soils, protect natural saline and sodic soils, and scale-up sustainable soil management practices

- Recommendation 7: Design **strategies** aimed at adopting good practices/options.
- Recommendation 8: Conduct an **economic assessment** of implementing good practices in the field.
- Recommendation 9: Support the development of **policy frameworks**.

# Global Status of Salt-Affected Soils

The launch has been postponed to 2022

Submitted (35)		Not submitted (37)		Last minute map submissions (49), not contacted yet	
Argentina	Lebanon	Afghanistan	Mozambique	Austria	Laos
Armenia	Lesotho	Bolivia, Plurinational	Myanmar	Belgium	Latvia
Azerbaijan	Mexico	Brazil	Nicaragua	Benin	Liberia
Bangladesh	Paraguay	Chad	Niger	Botswana	Lithuania
Burkina Faso	Peru	Colombia	Nigeria	Bulgaria	Luxembourg
Cambodia	Philippines	Congo, the Democratic Republic of the	Oman	Burundi	Macedonia
Cameroon	Russian Federation	Costa Rica	Pakistan	Canada	Malawi
Canada	Sudan	Djibouti	Papua New Guinea	CAR	Marshall Island
Cuba	Tanzania, United Republic of	Ethiopia	Rwanda	Cote d'Ivoire	Mauritania
Ecuador	Thailand	Georgia	Senegal	Croatia	Namibia
Eritrea	Trinidad and Tobago	Iraq	Somalia	Cyprus	Netherlands
Germany	Turkey	Jamaica	South Africa	Czech Republic	Palestine
Ghana	United States	Jordan	South Sudan	Denmark	Poland
Greece	Uzbekistan	Kenya	Sri Lanka	DRC	Portugal
Guyana	Venezuela, Bolivarian Republic of	Lao People's Democratic Republic	Togo	Equatorial Guinea	Romania
Hungary	Yemen	Madagascar	Ukraine	Estonia	Samoa
India	Zimbabwe	Mali	United Arab Emirates	Eswatini	Sierra Leone
Italy		Moldova, Republic of	Zambia	Finland	Slovakia
		Morocco		France	Slovenia
				Gabon	Spain
				Gambia	Sweden
				Guinea	Syria
				Guinea-Bissau	Tunisia
				Ireland	United Kingdom
				Kuwait	



16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting



# Global Assessment of Salt-Affected Soils: Table of Content

## Introduction

### Chapter 1. The assessment of salinity / sodicity / alkalinity

### Chapter 2. Mapping and monitoring of salt-affected soils

- 2.1. The methodology of mapping at the local, national and global scale
- 2.2. The development of bottom-up approach to monitor SAS

### Chapter 3. The national reports on the status of salt-affected soils

### Chapter 4. Salt-tolerant crops

- 4.1. Effect of salinity/sodicity on soil and plant growth
- 4.2. Salt tolerance mechanism
- 4.3. Crop tolerance and yield potential
- 4.4. Factors affecting salt tolerance

### Chapter 5. Sustainable management and economics of salt-affected soils

- 5.1. The main objective of reclamation of SAS (saline and sodic)
- 5.2. Irrigated farming
- 5.3. Rainfed farming
- 5.4. The economic aspects of SSM in SAS (with economic benefits)

### Chapter 6. Sustainable water management in saline environments

- 6.1. Water quality characterization, classification and its impact
- 6.2. Guideline for using brackish water
- 6.3. Specific toxic ions and their management

### Chapter 7. Specific cases of salt-affected soils

- 7.1. Grey water use
- 7.2. Urban and road salinization by chemicals (de-icing agents)
- 7.3. Overfertilization
- 7.4. Natural salinization caused by permafrost thawing
- 7.5. Salinization caused by oil extraction and other sorts of mining
- 7.6. Salinization of the coastal area caused by salt water intrusion
- 7.7. Tsunami-affected salinization of the coastal areas

### Chapter 8. The natural environments with salt-affected soils as a shelter of biodiversity

### Chapter 9. Governance related to the sustainable management of salt-affected soils

## Conclusions

16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting

# GLOSOLAN/INSAS joint working group

23 experts from 13 countries

## Tasks of the joint INSAS-GLOSOLAN WG:

- Revision of existing SOPs related to salt-affected soils
- Development of new SOPs related to salt-affected soils
- Transfer functions between different analytical methods
- Capacity development

## First meeting, March 17, 2022:

- Calibration between different measurements of EC and TSS
- SOP on Boron, experts volunteered to review

Full name	Country, Institution
Jason Reynolds	<b>Australia</b>
Adalbert Adibime Onana	<b>Cameroon</b> , International Institute of Tropical Agriculture (IITA) - ONE CGIAR
Georges K. Kome	<b>Cameroon</b> , University of Dschang
Magdi T. Abdelhamid	<b>Egypt</b> , National Research Centre
Margarita Hurtarte	<b>Guatemala</b> , Agrolaboratorio CERES
Shiveshwar Pratap Singh	<b>India</b>
U. Surendran	<b>India</b> , Centre for Water Resources Development and Management (CWRDM)
Pradip Dey	<b>India</b> , ICAR-Indian Institute of Soil Science
Guru Prasad Muppala	<b>India</b> , Sterline Bioremedis pvt ltd
Bijan Khalilimoghadam	<b>Iran</b> , Agricultural Sciences and Natural Resources University of Khuzestan(ASNRUKH)
Mohsen Baghery	<b>Iran</b> , Soil and Water Research Institute
Karim Shahbazi	<b>Iran</b> , Soil and Water Research Institute (SWRI)
Shabbir A Shahid	<b>Kuwait</b> , Environment & Life Sciences Research Center
Fassil Kebede	<b>Morocco</b> , Mohammed VI Polytechnic University
Zouahri	<b>Morocco</b>
Ahmad Mahmood	<b>Pakistan</b> , Muhammad Nawaz Shareef University of Agriculture
Zulfiqar Ahmad Saqib	<b>Pakistan</b> , University of Agriculture, Faisalabad
Mile Markoski	<b>Republic of North Macedonia</b> , Ss.Cyril and Methodius University in Skopje
Jamal Elfaki	<b>Sudan</b> , Nile Valley University
Ahmad Majar	<b>Syria</b> , GCSAR
Riham Zahalan	<b>Syria</b> , General Commission for Scientific Agricultural Research
Rich Ferguson	<b>USA</b> , Kellogg Soil Survey Laboratory (KSSL)
Todd Skaggs	<b>USA</b> , USDA Agricultural Research Service





# GLOSOLAN/INSAS joint working group first meeting

- Revision of existing SOPs related to salt-affected soils:
  - SOP for electrical conductivity
  - SOP for saturated soil paste extract
  - SOP for boron
- Development of new SOPs related to salt-affected soils:
  - ESP, several analytical methods
  - SAR, several methods
  - Alkalinity in soil saturated paste extract
  - Conservation of samples (to avoid precipitation of cations and alkalinity)
  - Analysis of Boron, several analytical methods
  - Soil sampling design, volume and homogenization of samples.
  - Soil particle size analysis



Food and Agriculture Organization of the United Nations

GLOBAL SOIL PARTNERSHIP

*Joint working group on  
salt-affected soils analysis GLOSOLAN/INSAS*

*First Meeting*  
*17 March 2022*  
*from 1:00PM to 3:00 PM CET (Rome time)*  
*Virtual meeting*

International Network of Salt-Affected Soils

**GLOSOLAN**  
GLOBAL SOIL LABORATORY NETWORK

## First tasks:

- Calibration between different measurements of EC and TSS
- SOP on Boron, experts volunteered to review

16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting

# INSAS working sessions (May – September 2021)

Working group	1 <sup>st</sup> working session	2 <sup>nd</sup> working session
SAS&Assessment: Mapping, assessing and monitoring of salt-affected soils	<p><b>May 24:</b> getting to know each other and defining the priority theme</p> <p><u>Decision:</u> Review and refinement of methodology for mapping salt-affected soils</p>	<p><b>August 2:</b> Discussion of the concept, structure, and content of the refined methodology for mapping salt-affected soils</p> <p><u>Outcome:</u> the draft Table of Content</p>
SAS&SSM: Sustainable management of salt-affected soils (practices, policy)	<p><b>May 25:</b> getting to know each other and defining the priority theme</p> <p><u>Decision:</u> Good practices: database on SSM practices of SAS (part I “Inventory”)</p>	<p><b>September 13:</b> revision of the draft of the Practice/Technology for sustainable management of salt-affected soils</p> <p><u>Outcome:</u> the revised template</p>
SAS&Crops: Halophyte agriculture and salt-tolerant crops and plants	<p><b>June 14:</b> getting to know each other and discussion of the models/scenarios which predict the crop/plant production based on soil salinity/sodicity levels</p> <p><u>Decision:</u> collect the existing information about such models/scenarios to overview in the next meeting</p>	In 2022
SAS&Water: Integrated soil and water management under saline/sodic conditions	<p><b>June 15:</b> getting to know each other and defining the priority theme</p> <p><u>Decision:</u> Development of the manual on sustainable water management in saline/sodic environments</p>	In 2022

16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting





# Salinity Working Group activity in the period 2018-2022 (term 3 of ITPS)

## MAIN ACHIEVEMENTS:

- **International Network on Salt-Affected Soils** established and work plan developed
- **GSAS Symposium** organized and held
- **GSAS Outcome document** prepared
- **Global Status of Salt-Affected Soils**, content developed and reviewed
- **Questionnaire on the Status of Salt-Affected Soils** developed



16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting





Food and Agriculture  
Organization of the  
United Nations

itps

INTERGOVERNMENTAL  
TECHNICAL PANEL ON SOILS

16<sup>th</sup> Working Session of the Intergovernmental Technical Panel on Soils (ITPS)  
28, 29 and 30 March 2022 | Virtual meeting

