



Food and Agriculture  
Organization of the  
United Nations



**Soil Atlas of Asia-III/20/Report**

# **Report of the WRB workshop, Soil Atlas of Asia**

Online meeting, 25-26 June 2020

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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## Introduction

A dedicated workshop was organized on the correlation of national soil classification schemes with the World Reference Base (WRB) 2006 system (see the decisions of the 2nd Editorial Board meeting on mapping and classification in Annex 1). Participants represented countries in the Asian Soil Partnership, the Near East and North African Soil Partnership (Yemen, Oman, United Arab Emirates, Saudi Arabia, Jordan, Israel, Bahrain, Qatar, Kuwait, Iraq, Iran, Syria, Lebanon) and the Eurasian part of the European Soil Partnership (Armenia, Georgia, Azerbaijan, Turkmenistan, Uzbekistan, Kazakhstan, Tajikistan, Kyrgyzstan). Ultimately, all maps will be merged to form a regional map that will form the basis for overview and map spreads in the Soil Atlas of Asia.

Because of COVID-19 situation, the workshop was implemented on the Zoom platform. Forty-two participants from 20 countries attended on 25 and 26 June 2020 from 7 to 11 AM CET (see Annex 2). The workshop was opened with remarks from Ronald Vargas (GSP Secretariat, FAO), Arwyn Jones (JRC, European Commission) and Dr. Kwon Taek-Ryoun (Secretary-General, AFACI Secretariat). The importance of the Atlas as a tool to promote sustainable soil management was highlighted. Emphasis was put on the role of the Atlas in harmonizing soil data and information in the region, and assessing and monitoring soil conditions. In this regard, it was pointed out that the work countries are doing to prepare the maps for the Atlas is connected to the establishment of National Soil Information Systems and ultimately to the creation of the Asian Soil Information System (ASIS) that will be connected to the Global Soil Information System (GLOSIS) of the Global Soil Partnership, FAO.

## Main activities

The workshop consisted of two sessions (see Agenda in Annex 3):

- Session 1: **Conversion of national soil classification systems to the WRB**. Trainer Dr. Erika Micheli from the IUSS/Szent István University, Hungary.

The session started with an overview of the correlation tables submitted by national experts to Prof. Micheli and the WRB maps (shapefile) submitted to Mr. Viatkyn. Participants were asked to cross check these information and inform the trainers and Soil Atlas of Asia coordinators, Mr. Arwyn Jones (JRC-EC) and Ms. Lucrezia Caon (GSP/FAO), if something was missing or wrongly reported.

Prof. Micheli gave a presentation on the WRB classification system, recalling its basic principles and rules for classification. Difficulties in correlation from Soil Taxonomy to WRB, especially for several commonly found soils in Asia were highlighted. Priority/correlation issues determined by the sequences of highest level units in the key and the main issues facing users who are converting data to WRB were also discussed through the use of examples. In this regard, participants were invited to send examples of soils that were difficult to classify or convert to the WRB 2006 classification system. This exercise served to both train participants and assist them moving forward with the conversion of their national soil classification systems into the WRB 2006.

An example of a good correlation table was presented. Prof. Micheli closed her session by inviting participants and countries to send her their revised national correlation tables before moving into mapping and to contact her by email in case of need.

- Session 2: **Preparation and harmonization of national soil classification maps**. Trainer: Mr. Kostiantyn Viatkin, GSP/FAO

During this session, Mr. Viatkyn recalled the map requirements for the Atlas and demonstrated how to use ArcGIS or QGIS to ensure that these requirements are met. In summary, users were asked to provide:

1. Shapefile file format: complete with .shp, .shx, .prf, .dbf components
  - Coordinate system (projection) should be defined
  - Correct geometry (preferably using FAO country border)
2. Attributes with following columns:
  - **WRB\_Soil\_Name** (full name with qualifiers)
  - **RSG** (separate column)
  - **Qualifier\_1** (separate column)
  - **Qualifier\_2** (separate column)
  - Supplementary qualifiers if any (each in a separate column)
3. Correct naming in the attributes (no typos)
4. All attributes – according to WRB (no complexes, no undefined areas)

The session was ultimately closed by a reflection on the harmonization of borders, which will be discussed through a dedicated online or (if required) bilateral session later in the year. In order to anticipate and facilitate the work on the harmonization of borders, the GSP will send a single file of national borders all countries. Countries with conflicting borders can send us the map in their own borders.

## Conclusions and way forward

In conclusion, deadlines and milestones were discussed. In order to complete and publish the Soil Atlas and Asia by December 2021:

- **National correlation tables** (from national classification systems to the WRB 2006) **should be finalized by 10 July**. Those countries and experts that are unable to meet this deadline are kindly invited to communicate it to Ms. Lucrezia Caon ([lucrezia.caon@fao.org](mailto:lucrezia.caon@fao.org)) and Mr. Arwyn Jones ([arwyn.jones@ec.europa.eu](mailto:arwyn.jones@ec.europa.eu)) by email as soon as possible
- All **national soil classification maps (in shapefile)** **should be submitted** to the GSP Secretariat by **14 September**. Please take Ms. Lucrezia Caon ([lucrezia.caon@fao.org](mailto:lucrezia.caon@fao.org)) and Mr. Kostiantyn Viatkin ([kostiantyn.viatkin@fao.org](mailto:kostiantyn.viatkin@fao.org)) at reference for the submission. Mr. Viatkyn will create a single layer by putting all maps together. Missing data and inconsistencies will be highlighted.
- **At the end of October 2020, a four day meeting (from Tuesday to Friday) data and borders harmonization will be organized**. A day will be dedicated to each region: Tuesday for Asia, Wednesday for Eurasia and Thursday for NENA. All regions will attend the meeting on Friday.

- By the end of December 2020 the Asia Soil Map should be finalized. Last review.
- In January 2021, the map will be sent to the graphic designers for inclusion in the Atlas.

## Annex 1: Decisions on soil classification and mapping made at the 2<sup>nd</sup> Editorial Board meeting

### Soil classification

Ms. Erika Micheli (Szent István University) provided lectures and on the field trainings on the use of the World Reference Base for Soil Resources (WRB) for soil classification. Ultimately, the decision to use the WRB 2006 classification system for preparing the maps in the Atlas was made. This decision was based on (1) the fact that limited data for using the WRB 2014 and 2015 are available, and (2) the decision to avoid using use transfer functions and calibrations for preparing the maps. However, the difference between the WRB 2006 and the WRB 2014 was highlighted by Japan, who showed how their map changed when they passed from a system to the other.

All maps submitted for the Atlas should include the difference group and one dominant qualifier. For countries that have the WRB 2014 or 2015 in place: if some qualifiers in the WRB 2014 or 2015 is not in the WRB 2006, this can still be reported in the soil classification of the Atlas.

Decisions on specific soil types:

- Heptic (typic) soil units should be avoided as much as possible in the Atlas. Eventually, soils should be classified using other parameters like soil depth.
- Frozen soils: if the soil depth is less than 20cm then soil classification can be skipped.
- Suphidir soils: a section for these soils should be added in the Atlas.
- Histosols: their fragility to climate change and carbon sequestration should be highlighted.
- Criosols: Nepal to write about them in the Atlas.

Soil types can be divided into two groups: major and minor soil types depending on the data and information collected. Indeed, there is the risk that it will not be possible to represent minor soil types in the dedicated maps. These distinction will be reported right after the section on “The World Reference Base for Soil Resources” at page 52 in the print out.

Ms. Micheli will prepare a form for harmonizing soil classification building on the table for converting soil taxonomy developed by Thailand (see Annex 1).

### Mapping

The Atlas will look at those areas not covered by other Atlases in the JRC series. However, the decision to include the Asian part of Russia and Turkey in the overview map on page 68-69 was made.

At present, only old maps of the area are available. New maps will be prepared using the data submitted by each country to the GSP and the JRC. By the end of May/beginning of June 2019, Mr. Jones will send an email to all countries asking them to provide polygon or raster information at a scale of 1:500.000. It would be easier to make maps with polygons but raster information can be accepted and then processed. What countries need to submit are:

- Name of the soil in their national classification scheme
- The perceived WRB translation
- Data and profile pictures of each legend unit. Mr. Jones will send countries a template with the data to provide, which will be kindly prepared by Ms. Micheli

Data should be submitted by the end of August 2019.

If some country fails to submit national data, then the Harmonized World Soil Database or the ISRIC map will be used to fill the gaps. Because the map from ISRIC is a prediction map, at the time of using it, a look should be paid to the uncertainty map. All data and information will be presented as they are at the purpose of triggering countries to submit more data or produce new ones. In this regard, no harmonization to the lower denominator will be made.

Small countries and countries with very detailed mapping are kindly invited to send their maps at the largest scale available. These can be used as examples of medium and large scale soil maps (reference: page 128 in the Soil Atlas of Africa).

In order to make the Soil Atlas of Asia consistent with the others in the series, the scale of the maps was set to 1:3.000.000. In their dedicated mapping spreads, **Turkey and Russia** will be represented at a scale of 1:6.000.000. To note that the scale of the map impacts the number of pages in the Atlas, which should be a multiple of 16, and its production cost. In order to reduce the cost, the proposal to have only one big foldable map at the end of the Atlas was made as well as the proposal to reduce the scale. Mr. Jones will enquire with the graphic company on the variation of costs if these proposals are taken into account.

*Mapping spreads:* Each spread is identified so for the meridian to be central to each page. **Islands and archipelagos** will be included as boxes in the spreads. Mr. Jones, will directly coordinate with the focal point of countries with islands to see how to better represent the islands. In all maps but in the overview map and their dedicated ones, Russia and Turkey will appear in white.

*Colors:* Mr. Jones will ensure that colors are coherent with those used in other Atlases of the series. However, the color of Andosols will be made a bit darker so to meet the request of the representative of Japan.

*Legend:* The reference soil groups in the legend of the Soil Atlas of Africa should be taken at reference. For the principal qualifiers, please refer to those in Annex 3 of the WRB 2006. The colors of the reference soil groups will be used throughout the whole Atlas, including in the “Major soil types of Asia – page 52 of the print out). The legend in the maps and spreads will contain only soils that appear in those specific maps

**Soils of Western Asia (Page 70-71):** Western Asia is a rather vague definition. There are not enough info on Jordan, United Arab Emirates and Qatar, GSP national focal points should be involved more in the preparation of the Atlas. Still, ICBA can give a contribution in terms of pictures and text on arid environment. Data on Sinai can also be retrieved from the Soil Atlas of Africa.

**Soils of central Asia (Page 72-73):** Central Asia is a rather vague definition. Decision to keep Afghanistan in central Asia and not to include the Russian part of the region in it.

**Soils of Southern Asia (Page 74-75):** Decision to increase the extent by which Bhutan and Nepal are represented in the print out. Decision to add Maldives to the map.

**Soils of Eastern Asia (Page 76-77):** Because this section is very packed, the possibility to divide the region into two parts so to keep them at the same scale of other maps was considered. Mr. Jones will prepare an overview of the maps to facilitate the decision making:

- If East and South-East Asia together are kept together, it will be possible to observe the diversity of their soils in relation to climate features. Thereafter, zooms in for the two areas can be added to the Atlas.
- If East and South-East Asia are treated as two sub-regions, on what basis will countries be divided? How to deal with countries like China that fall into both sub-regions? Countries cannot be divided into two.

Still, the final decision should be made considering the purpose of the map; harmonizing or showing differences? Eventually, the decision can be made considering the minimum polygon size so support small size countries.

Some of the spin offs of this Atlas could be to focus on specific situations.

### Data Policy

The JRC and the GSP will make a formal request to countries for sharing their maps and data. The GSP will enquire whether their soil data policy can be used for the Atlas.

## Annex 2. List of participants

### Opening speakers

Mr. Ronald Vargas, Global Soil Partnership Secretariat, FAO

Mr. Arwyn Jones, JRC-European Commission

Dr. Kwon Taek-Ryoun, Secretary-General, AFACI Secretariat

### Trainers

Ms. Erika Micheli, IUSS/Szent István University

Mr. Kostiantyn Viatkin, Global Soil Partnership, FAO

### Facilitators

Mr. Arwyn Jones, JRC-European Commission

Ms. Lucrezia Caon, Global Soil Partnership, FAO

Mr. Filippo Benedetti, Global Soil Partnership, FAO

### Participants

Country	Name
Azerbaijan	Amin Ismayilov
Azerbaijan	Fikrat Feyziyev
Azerbaijan	Sultan Huseynova
Bhutan	Dawa Tashi
Bhutan	Tsheten Dorji
Cambodia	Phy Chhin
India	Partha Pratim BISWAS
Indonesia	Markus Anda
Iraq	Waleed M. Al Shafie
ITALY	CLAUDIO ZUCCA
Italy	Pandi Zdruli
Japan	Hideo KUBOTERA
Japan	Yusuke TAKATA
Japan	Yuta ISE
Japan	Yuji MAEJIMA

Lao PDR	Saysongkham Sayavong
Lao PDR	Mr. Vikham Mektakoul
Mongolia	Batkhisig Ochirbat
Mongolia	Ganzorig Ulgiichimeg
Mongolia	Byambaa Ganbat
Myanmar	Dr. Su Su Win
Myanmar	Aung Kyaw Thu
Nepal	S P Vista
Pakistan	Muhammad Sabir
Pakistan	Waqar Ahmad
Pakistan	Munir Zia
Republic of Korea	Sangho Jeon
Republic of Korea	Byounghwan Seo
Republic of Korea	Yeonkyu Sonn
Sri Lanka	Dr. U.W.A. Vitharana
Sri Lanka	Harsha Kumara Kadupitiya
Syria	Alaa Khallouf
UAE	Bayan Athamneh
UAE	Wafa Faisal Al Yamani
UAE	Anil Kumar
UAE	Rommel De Torres Pangilina
UAE	Sai Ravi Krishna
UAE	Anuja Vijayan
UAE	Tariq Al Kharusi
UAE	Ahmed Hamdy Ali EL-Naggar
Vietnam	Quyett M. Vu

## Annex 3. Agenda

### 25 June

- 7:00 – 7:20 CET** | **Opening of the workshop and endorsement of the agenda**  
*Ronald Vargas, GSP Secretariat, FAO*  
*Arwyn Jones, JRC-European Commission*  
*Dr. Kwon Taek-Ryoun, Secretary-General, AFACI Secretariat*
- 7:20 – 8:00 CET** | **Conversion of national soil classification systems to the WRB: overview**  
*Erika Micheli, IUSS/Szent István University and Kostiantyn Viatkin, GSP/FAO*
- 8:00 – 11:00 CET** | **Correlation exercise – based on the experiences with the countries examples**  
*Erika Micheli, IUSS/Szent István University*
- 11:00** | **Wrap up and closure of the day**

### 26 June

- 7:00 -8:00 CET** | **What is a good correlation table?**  
| **Correlation exercise – based on the experiences with the countries examples**  
*Erika Micheli, IUSS/Szent István University*
- 8:00 – 9:30 CET** | **Participants should send questions / problems / examples after the 1<sup>st</sup> day – that we discuss, solve**  
*Erika Micheli, IUSS/Szent István University*
- 9:00 – 10:30 CET** | **Preparation and harmonization of national soil classification maps**  
*Kostiantyn Viatkin, GSP/FAO*
- 10:30 – 11:00 CET** | **Next steps**  
*Arwyn Jones, JRC/EC and Lucrezia Caon, GSP/FAO*
- 11:00 CET** | **Closure of the workshop**

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