



Food and Agriculture
Organization of the
United Nations

World Soil Day

**Halt soil salinization,
boost soil productivity**

5 DECEMBER 2021



Soil Salinity Mapping and Biosaline Agriculture in Kazakhstan

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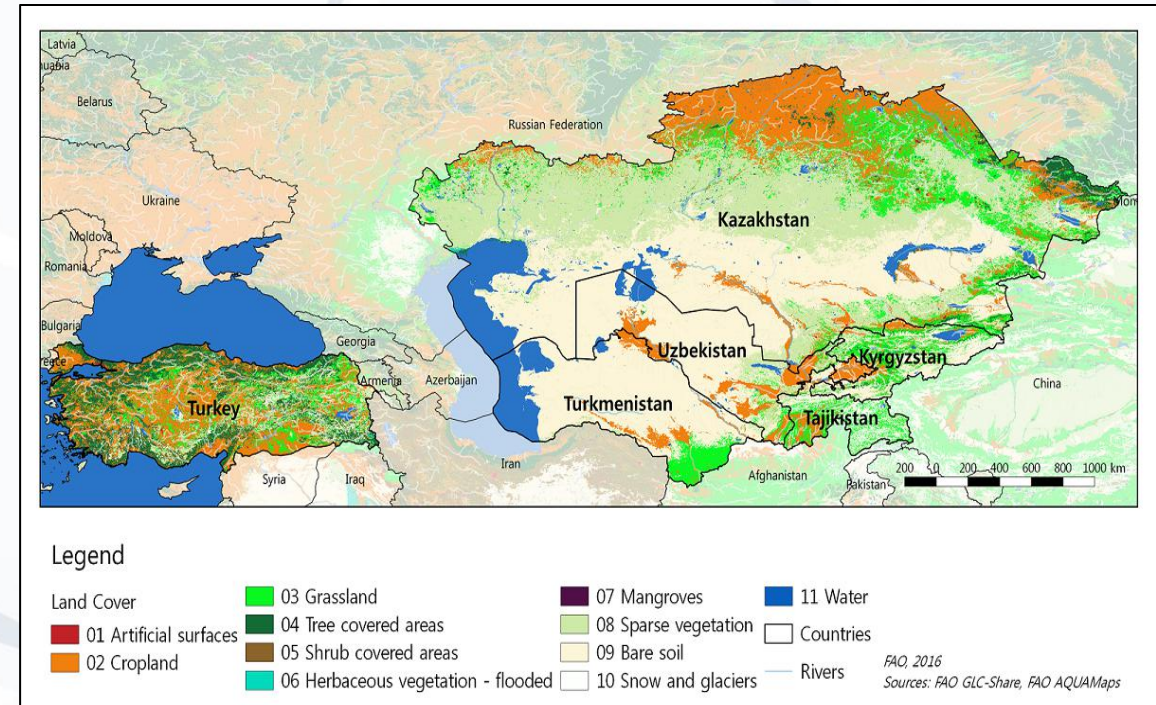
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Background Information

- **CACILM-2** is a regional FAO-GEF project in **5 Central Asian countries and Turkey** and aims to scale up best practices and integrated natural resources management approaches in drought-prone and salt-affected land.
- Kazakhstan with its typical arid climate and intensive irrigation agriculture in some its parts is severely exposed to the risk of soil salinization.
- An outdated soil salinity map and a lack of knowledge and skills impeded the effectiveness of efforts to combat the soil salinization.





Soil salinity mapping (last updated: 1980s)

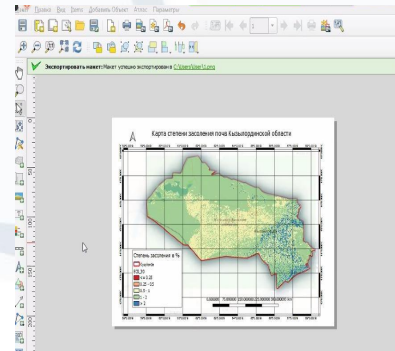


CACILM-2

Training sessions on
ground
measurement &
GIS tools

Ministry of Agriculture

Ground data
collection



CACILM-2

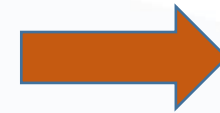
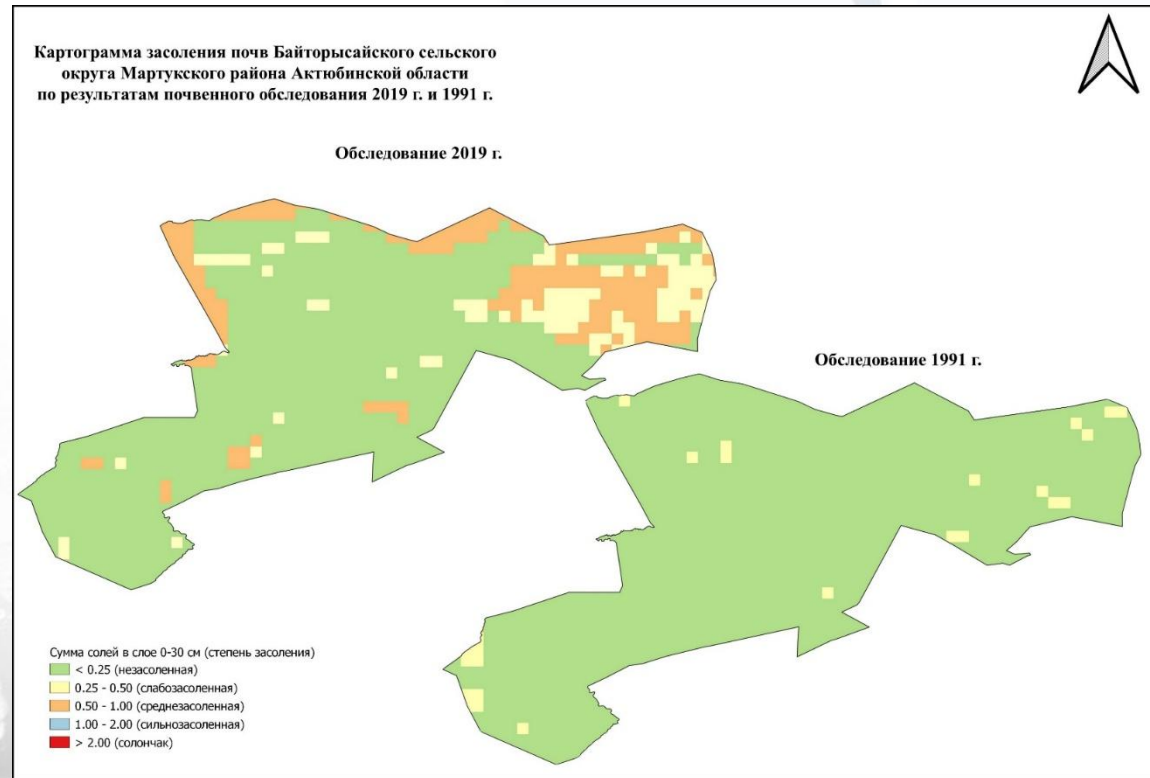
Calibration of
remote sensing
data with the
ground data

Predictors:

- Relief
 - Vegetation
 - Geology
 - Climate
 - Satellite images
-
- **Methodology:** Digital Soil Mapping (DSM). The input soil data consists of more than 30,000 soil profiles that were surveyed between 2004 to 2019, at soil depths from 0 to 30 cm.



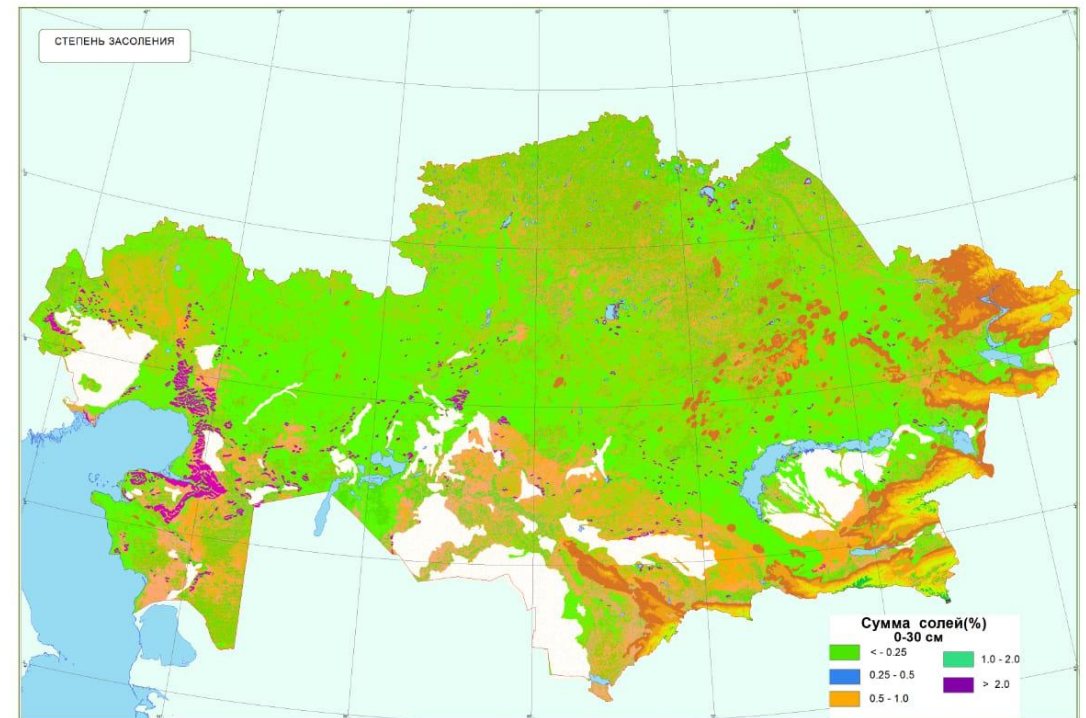
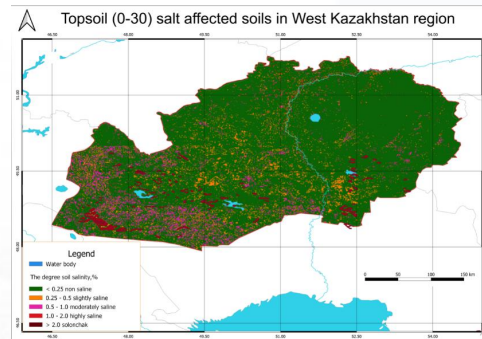
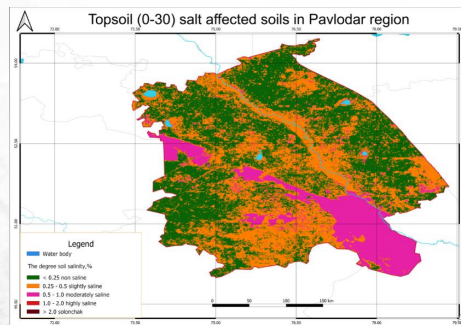
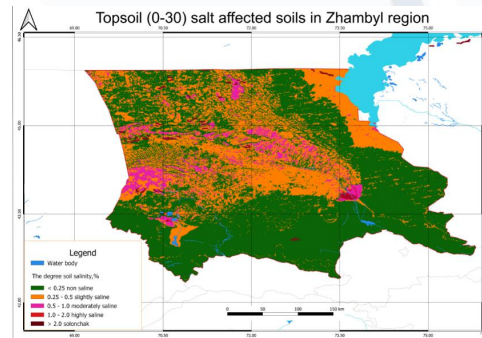
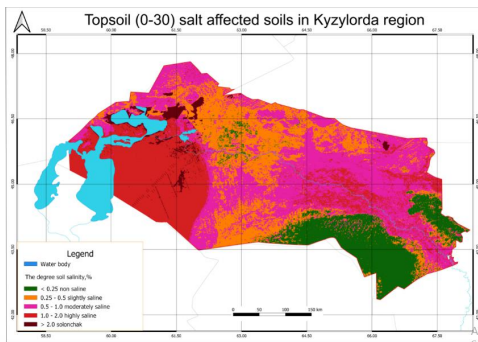
Soil salinity mapping: a case of the Baytorysay rural district of the Aktobe province (oblast), Kazakhstan



For a period of 28 years (1991-2019), the area of saline lands in the Baytorysay rural district (RD) increased by about 7950 ha, i.e. out of 47,740 ha of all lands, approx. 16.5% of all lands in the RD



Soil salinity mapping: A province (oblast) and national level, Kazakhstan



- Soil salinity maps of 4 provinces/oblasts (Kyzylorda, Pavlodar, West Kazakhstan and Zhambyl)
- A preliminary national salinity map

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Biosaline Agriculture in Central Asia: A Guideline



I

Classification & assessment of saline soil

II

Reclamation of saline soil

III

Salt tolerance of crops

IV

Biosaline agriculture

V

Cross-cutting themes (e.g. value chain, gender, etc.)

- An integrated modular approach was applied for a manual, which addressed soil, water, biosaline agriculture, and more.
- A special focus was given to the specific circumstance of Central Asia with rich field examples, particularly of Kazakhstan.
- Cross-cutting themes were considered to achieve SDGs in a more comprehensive way.

- The manual will improve farmers' knowledge of salinity management.
- The best biosaline practices are to be applied to salinity vulnerable areas identified by the soil salinity mapping, and the subsequent change in salinity will be monitored by a regular update of the map.

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