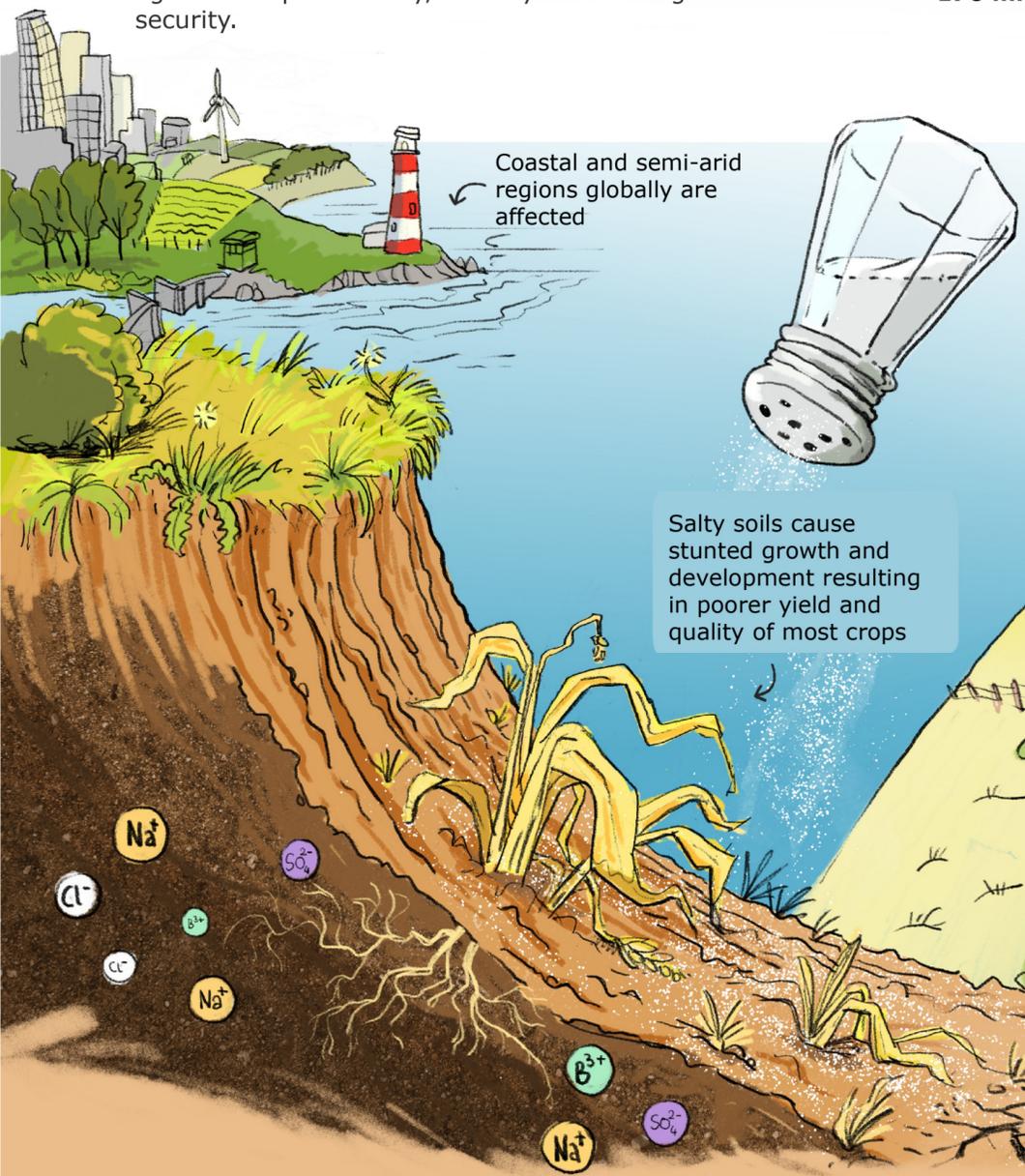


SALINIZATION: ALL HANDS ON DECK

This work was produced as part of the KB34 "dealing with Salinization" project (KB-34-002-029). Funding was by the Circular and Climate-neutral Society programme that is supported by the Dutch ministry of Agriculture, Nature and Food security.

Our soil and water bodies are getting saltier. Sea level rise, human practises and climate change contribute to the salinisation of soils and freshwater reservoirs. Salinisation impacts ecosystems. Salinized regions suffer from low agricultural productivity, thereby threatening food security.

If we don't act now, we will lose **2 million acres** of arable land every year. This is equal to food for **170 million people**



Option 1: SALINE ADAPTED AGRICULTURE

Option 2: LAND USE CHANGE

1 Irrigation innovation

3 Salt tolerant species and varieties

2 Amendments/biostimulants

5 Soil management

4 Drainage

7 Coastal protection

6 Halophytes

9 Nature conservation

A complex puzzle

There is no silver bullet to deal with salinization. Solutions must be tailored for each case. We need to combine strategies to achieve the best results. While we have many saline agriculture-based strategies or land-based strategies, we still need to find out which combined strategies are most economical and environmentally friendly.

Contact us to find out what we are working on

1 Precise irrigation using a drip or furrow irrigation system washes out excess salt from the root zone of plants, creating a suitable environment for plant growth. Water desalination technologies that separate and remove salts from water may also be installed.

2 Amendments, including biostimulants, are bioactive substances added to plants or soils to improve plant growth and yield in salty conditions. Popular amendments used in saline agriculture are zeolite, biochar and biostimulant. Biostimulants can be derived from seaweeds, silicon, protein hydrolysates or microbes.

3 It is possible to select salt-tolerant species such as quinoa, beets, or date palms. In some crops e.g., wheat and potato, you can also select or breed for more salt-tolerant varieties.

4 If excess water is left to evaporate, the dissolved salts stay behind in the soil. Proper drainage systems reduce excess water evaporation and facilitate the removal of highly salinized water from the soil.

5 Improved cultivation systems by planting on soil ridges or beds have a positive effect on the crop and soil. Raised growth beds ensure that root systems of crops can be shielded from the surrounding salty groundwater.

6 Halophytes such as samphire and sea aster can tolerate severe saline conditions. They can be grown on saline soil for consumption as food and feed, or to provide biomass for industries.

7 Dams, dykes and grey infrastructures protect coastal regions from the devastating effects of salinisation.

8 Salinized soils can be reclaimed by phytoremediation using trees such as poplars and mangroves. This is a long-term process facilitated by tree crops taking up and reducing salt in soils.

9 If the soil has become too salty for agriculture, land use transitions would be necessary. Agricultural land can be repurposed to salt marshes and nature reserves that serve as ecological habitats.