3) Promoting Sensor-based Salinity and Soil Health Monitoring.

Introduction and promotion of portable soil sensor equipment for improved land use decision making and agricultural advisory.

4) Fostering Networks on Saline Agriculture.

Establishing strategic networks among national and international institutions for enhanced knowledge exchange on Saline Agriculture, and at the same time anchoring of the concept in local institutional structures.

Each of the 4 partner institutions, based on their respective competencies, contributes equally to the project's implementation. While the Municipal Council of Maputo and ABIODES lead the agricultural extension and capacity building components, the UEM holds responsible for the scientific components, and Weltweit e.V. provides overarching support in terms of project management, networking and fundraising.

Having been kicked-off in 2019, the project is envisioned to run over a timespan of at least 3 years, with prospects of extension and regional upscaling.

More detailed information and updates on the project's progress can be accessed under the following website:
https://welt-weit.org/salinization-of-maputos-horticultural-soils

Mobile soil sensing equipment.

Technical exchange visit.

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Innovative Strategies to Manage Salinity in Horticultural Production Systems (SaliHort)

Piloting and Promoting Saline Agriculture in Mozambique

Abandoned agricultural plot due to salinity.

Salinity and its Impacts on Agricultural Production Systems.

Salinization is one of the major drivers of land degradation globally, with far reaching consequences for agricultural production und ecosystem functioning. Existing estimates surmise up to 1 billion hectares of land to be salt-affected worldwide. In the light of ever intensifying human land use, as well as climate change, this area is likely to increase over the coming decades.

Mozambique is especially vulnerable to this trend due to its coastal location, thus being susceptible to sea water intrusion. The agricultural production zones of the country's river basins, to a significant extend, contain saline subsoils resulting from ancient marine deposits, requiring adequate management of irrigated agriculture to prevent salinization processes.

One example are Maputo's extensive peri-urban vegetable production areas. They account for approximately 1.200 hectares of agricultural land, cultivated by 11.700 smallholder farmers, and are able to meet a significant share of the city's vegetable demand. Previous research confirmed their proneness to salinity and reported declining yields, loss of agricultural land, as well as a lack of effective local coping strategies.

Typical effects of salinity.

Beetroot, a salt tolerant crop.

Saline Agriculture - Innovative Solution Approaches.

However, there are feasible solutions at hand. Scientists and agricultural practitioners over time have identified and documented a variety of agricultural practices which allow for agricultural production under saline conditions. Other practices even have the potential to reverse salinization processes. Such innovative approaches are brought together under the concept of Saline Agriculture. In general terms this includes:

a) Choice of tolerant crops and cultivars.

b) Adapted irrigation management.

c) Adapted fertilizer management.

d) Management of soil structure and organic matter, specifically through the use of organic manures and soil amendments.

e) Targeted application of catch-and intercrops with phytoremediation potential.

f) Further management support can be achieved through accessible and timely soil monitoring, for example based on portable sensor equipment.

Saline Agriculture thus embraces and strategically adapts practices common to other concepts like Agroecology, Integrated Soil Management, Climate Smart Agriculture, amongst others.

However, the respective approaches are not universally applicable and need to be adapted to the local particularities of production systems. Especially smallholder vegetable production systems in (sub-)tropical environments are still rather poorly understood in this regard. There exists a clear need for application-oriented research and innovation on how to adapt the principals of Saline Agriculture to these contexts and promote them adequately, a research gap the presented project intends to tackle.

Field trial.

Students monitoring the field trial.

Our Approach - Objectives and Activities of the Project.

The project's objective is to render tangible the approaches of Saline Agriculture and apply them to the Mozambican context. The vegetable production zones of Maputo constitute an ideal location for piloting innovative soil salinity management strategies under strong farmer participation in the country. This is due to its unique context of:

a) soil salinity being a pressing issue,

b) the high level of organization of the farming community,

c) the strong agricultural extension support structure,

d) the proximity of renowned research and development institutions.

While the main focus lies on horticultural production systems, the project intends to tackle questions beyond this priority area, and in any case, seeks to generate scalable knowledge gains. Accordingly, the following 4 activity packages are implemented:

1) Scientific Field Trials.

Testing of promising agronomic soil salinity management strategies under field conditions.

2) Farmer Field Schools.

Integration of local farmers in the experimental process, and at the same time conveying Saline Agricultural principals along with general good soil and water management practices in a participatory manner.

Farmer Field School session.