# Mozambican Saline Agriculture Research and Practice (MoSARP)

FINAL REPORT

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## Contents



## Annex Documents

## 1. Background and Problem Statement

The MoSARP project was implemented as one of three initiatives supported by the Seed Money Facility of the Saline Water & Food Systems Partnership (SW&FS) in 2024. This funding programme, convened by the Netherlands Food Partnership (NFP) and the Netherlands Water Partnership (NWP), principally supports projects and activities aiming to strengthen cooperation between the Dutch water and agrifood sectors to address the challenge of salinity in low and low middle income countries. Its objective is to help create new networks and facilitate access to follow-up funding, thus allowing for scaling salinity and Saline Agriculture research and practice.

Eastern Africa faces severe agricultural challenges as a consequence of soil and water salinization. Due to its long coastline, the effects of salinity are particularly severe in Mozambique. Next to seawater intrusion, causative factors include inherently saline substrates on which local soils developed, inappropriate soil and water management, next to unfavorable hydro-climatic patterns aggravated by climate change (Mazuze 1999, Pandey et al. 2024). Excessive land clearing is further exacerbating land degradation in Mozambique (Grinand et al. 2018). Coastal lowland environments are generally the most affected by above-described trends. At the same time, they constitute some of the most important agricultural production zones of the country. Locally adaptable and scalable land management solutions addressing salinity are poorly developed. Only recently, a few pilot projects active in the southern part of the country, introduced innovative Saline Agriculture approaches. These included, i.a., the RESADE (IIAM) and SaliHort (Weltweit) projects. However, these initiatives focussed on classical approaches of crop salt tolerance, along with soil and water management. Hence there is a pressing need for more comprehensive solutions, harnessing the whole spectrum of agroecological management solutions adapted to coastal agricultural systems, including agroforestry (The Salt Doctors 2023). At the same time, despite the severity of the salinity problem, and the existence of first applied Saline Agriculture initiatives in the country, a holistic institutional approach to address the issue is a key development gap (Smaoui et al. 2024). A central pertinent challenge is to sustainably integrate the knowledge generated in research and development projects into teaching curricula of national higher and professional education institutions with a mandate to train agricultural professionals.

The MoSARP project aims at addressing these challenges in an integrated manner, bundling the expertise of Mozambican and international experts in the fields of salinity and agroforestry to jointly devise a roadmap for Saline Agriculture development at field and institutional level, adapted to the Mozambican context.

***Figure 1:*** Examples of salt-affected degraded agricultural land in Mozambique. Left: Abandoned rice field overgrown with Salicornia spp. in the Chókwe Irrigation Scheme. Right: Visible salt accumulation in a rice field at the onset of the rainy season in the Incomati River Basin, Marracuene District.

## 2. Project Approach and Objectives

MoSARP's approach focuses on fostering new collaborations and leveraging local and international knowledge to address above-outlined salinity management challenges prevalent in Mozambique. The project follows a phased strategy, combining various virtual and in-person interactions, along with field pilot establishment, and documentation/dissemination of results. The project consortium includes key Saline Agriculture actors from Mozambique (IIAM, ABIODES, UEM), which provide local expertise and priorly established research infrastructures, most importantly the field research locations which facilitate MoSARP's practical components. The two selected field locations represent 2 different salt-affected agro-ecological settings: coastal lowland rice production systems affected by seawater intrusion in Marracuene, and secondary salinization in an irrigated mixed upland-cropping system in Moamba (Figure 2-4).

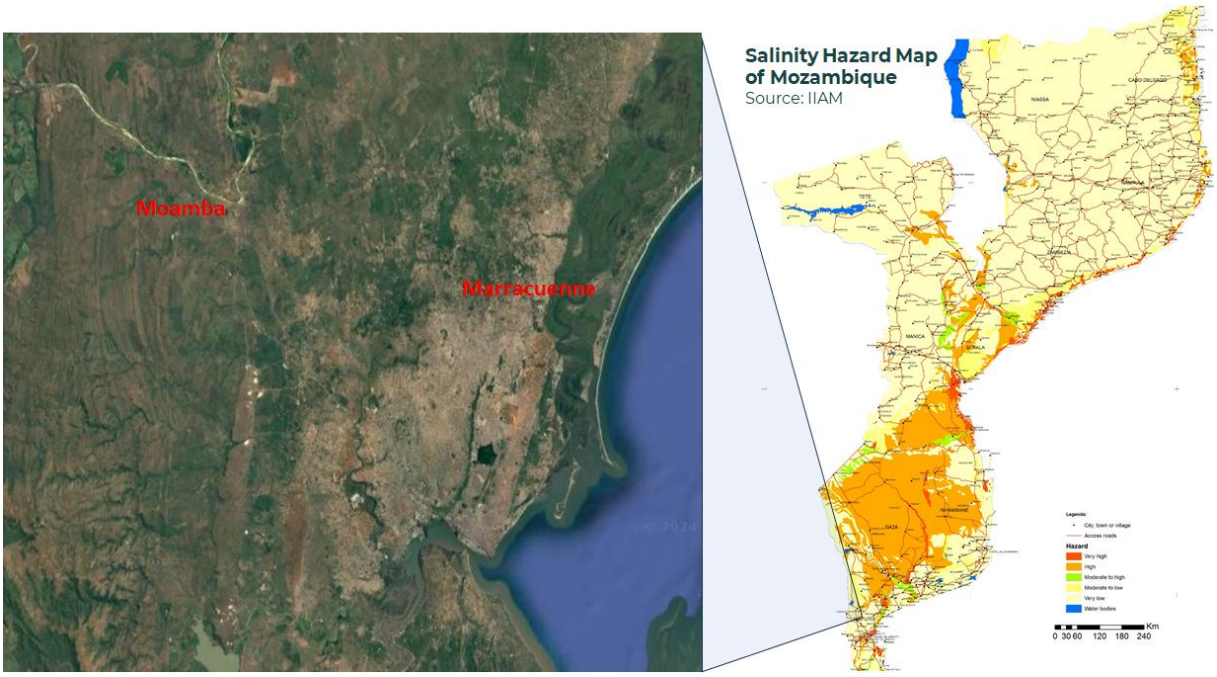


***Figure 2:*** Localization of MoSARP's field sites, against the background of Mozambique's Salinity Hazard Map.

***Figure 3:*** Field location 1, farmers' rice fields in Marracuene, located in the coastal plain of the Incomati estuary.

***Figure 4:*** Field location 2, RESADE's Best Practice Hub in Moamba, located in Moamba's Irrigation Scheme Bloco II adjacent to the Incomati river.

The project further integrates interdisciplinary expertise from Mozambique: ASSAMBA (Agroforestry), Europe: Weltweit (agronomic salinity management, network building), VU (social science aspects of Saline Agriculture, education and curricula development), The Salt Doctors (agronomic salinity management), and Eastern Africa: CIFOR-ICRAF (Agroforestry, soil management). In the frame of the individual workshops and webinars further local and international stakeholders and experts have been engaged, representing agricultural practitioners, science, civil society, private sector and governmental decision makers.

The following project objectives / expected outputs have been set:

1) Capacity gains: knowledge transfer between salinity and agroforestry professionals: i.a. presentation of best practices / successful case studies of Saline Agroforestry,

2) Improved networks: establishing target-oriented collaboration between local and international partners, aligning with the SW&FSP's goal of strengthening local networks and international cooperation,

3) Proof of concept: a field pilot providing first insights on feasibility, guiding future scaling of Saline Agroforestry,

4) Integrated training module design: identifying local salinity impacts and providing a modular approach for incorporating aspects of Saline Agriculture into training courses.

Based on these, a set of 6 work packages have been defined, which are outlined in the following section. The project consortium achieved seamless project coordination and implementation, consistently interacting via virtual team meetings, messenger communication and joint document management via Drive tools.

## 3. Work Programme

| Work Package | Description |
|---|---|
| Kick-off Webinar | To align expectations, goals and approaches amongst the consortium partners, to introduce Saline Agriculture and Agroforestry actors to each other, and to exchange on the topical status quo in Eastern Africa. Planned as an open event, with invites widely circulated via the networks of the consortium partners. Structured around technical presentations from project members and external experts. |
| Mapping of Salinity Initiatives and Education Courses | Desk study, covering aspects of Saline Agriculture in Mozambique and neighboring countries to identify best curricula-change entry points and partners for theoretical and practical education components. Led by VU, drawing on well-established methodologies applied in SALAD and Bio* projects. The assessment of entry points for integration of Saline Agriculture into university and TVET curricula is based on virtual questionnaires, distributed to Mozambican educational institutions. |
| Action Workshop | In-person workshop for exchange and co-creation of knowledge on Agroforestry approaches in Saline Agriculture, as well as discussing possibilities for a consistent integration of Saline Agriculture into curricula. Facilitated by representatives of all of the project's institutions. Target group: diverse stakeholders from Mozambique, including agricultural practitioners, representatives from research and education, NGOs, private sector and governmental decision makers. A seminar day, focussing on theoretical knowledge exchange, is complemented by practical field days at the two above-indicated project locations. Practical learning includes salinity assessment demonstrations, field pilot establishment, and focus group discussions with affected communities. |
| Saline Agriculture Field Pilot | Led by The Salt Doctors. Participatory site analysis at the two field locations visited during the Action Workshop, and joint conceptualization of possible local management approaches. Based on these initial results, a Saline Agriculture demo trial, integrating innovative soil, crop and agroforestry management approaches, is to be set up and monitored at both field locations. |
| Training School Concept Development | A survey among Mozambican universities and research institutes, led by VU, revealed no dedicated Saline Agriculture courses, whereas salinity assessment and management are covered within broader soil science and agricultural programmes. The Action Workshop provided a platform to assess suitable entry points for enhancing Saline Agriculture capacities within the existing educational framework. Together with the training participants, a training module concept was developed. Next steps include refining selected curricula content with experts and potential students, exploring dissemination strategies, and engaging with educational sector representatives to address challenges and opportunities for integrating the module into relevant curricula. |
| Technical Network Building and Outreach | Apart from the webinar and workshop interactions, continued networking and knowledge exchange is to be achieved by the following means: The establishment of a Saline Agriculture working group on the Action Network Worldwide platform (Weltweit) is open to all project stakeholders and the wider interested public. All project outputs (presentations, reports, publications, etc.) will be made accessible via the platform. The public relation channels of all consortium partners are used for awareness raising and sharing of project experiences and results, e.g. website blogs, social media, Saline Agri Map. |

## 4. Outputs by Work Package

### 4.1. Kick-off Webinar

The kick-off Webinar was conducted on September 18th 2024 under the title "Agroforestry Solutions for Salt-Affected Coastal Environments in Eastern Africa". A total of 6 speakers covered a variety of topics, including land degradation trends, seawater intrusion and different agroecological salinity management strategies (see Annex II for the full webinar programme). We registered 25+participants throughout the webinar. Active interaction and discussions between participants and presenters were facilitated verbally and via the chat function. The recording of the webinar and the individual presentations can be accessed via the ANW platform upon registration.

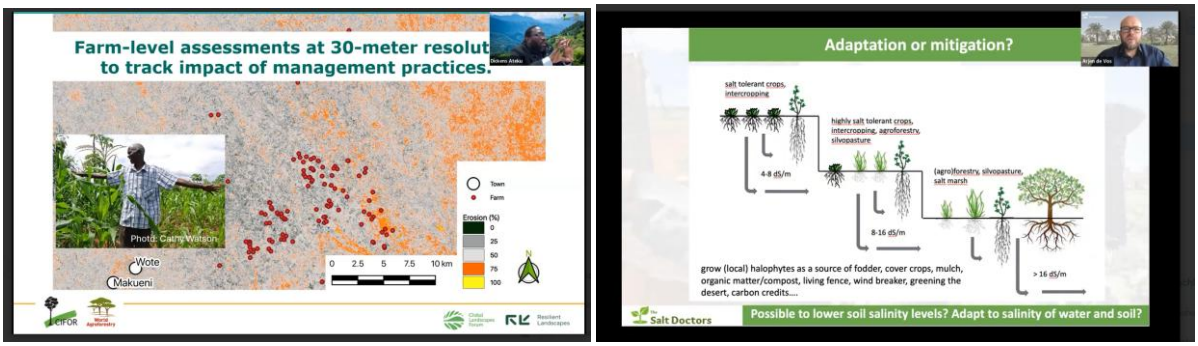


***Figure 5:*** Screenshots from selected webinar presentations.

### 4.2. Mapping of Salinity Initiatives and Education Courses

#### *4.2.1. Mapping of Salinity and Agroforestry Initiatives*

A desk study was conducted to investigate international, regional, and local initiatives addressing salinity issues and agroforestry. These initiatives were meticulously researched, systematically collected in a database, and methodically mapped according to their actors, functions, and themes. Well-established methodologies from SALAD and Bio* projects were applied in this study (see links below). A total of 15 initiatives were identified and subsequently analyzed, of which six (60%) have an international scope, three (20%) are regionally focused on East Africa, and six (60%) operate within the national context. Short summaries of the individual initiatives will be published on the Saline AgriMap, in order to increase their visibility and contextualise them in the global Saline Agriculture actors landscape.

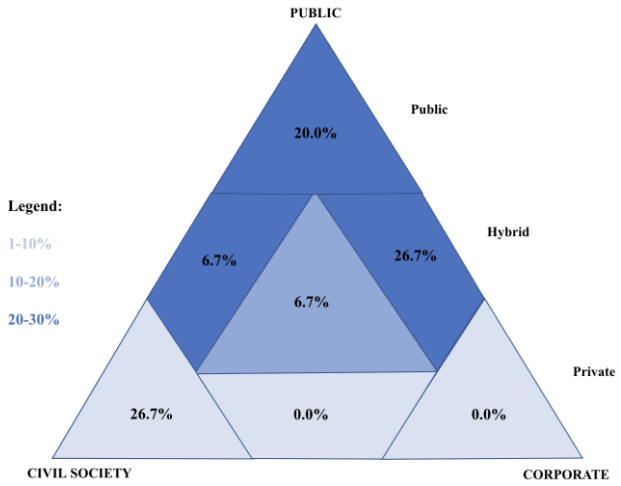


***Figure 6:*** *Governance triangle for international, regional, and national initiatives active in Mozambique. The seven zones show the percentages of actor constellations within the initiatives analysed. Concept adapted from Abbott and Snidal (2009a, 2009b) and Abbott (2012).*

The actor constellation of the initiatives demonstrates a predominance of purely civil society initiatives and initiatives that are established by public and corporate actors (26.7%, respectively). 6.7% of the initiatives comprise all three actor types or a combination of civil society and public actors. None of the initiatives is constituted exclusively out of private actors.

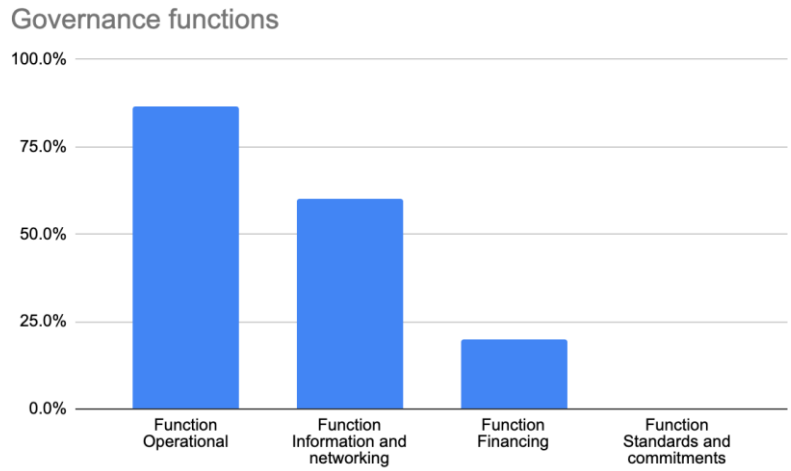


***Figure 7:*** *Initiatives by functions.*

86.7% of the initiatives perform operational functions such as setting up pilot projects, while 60% of the initiatives focus on information exchange and networking. Only 20% of the initiatives perform financing functions and none of them try to implement standards or commitments.

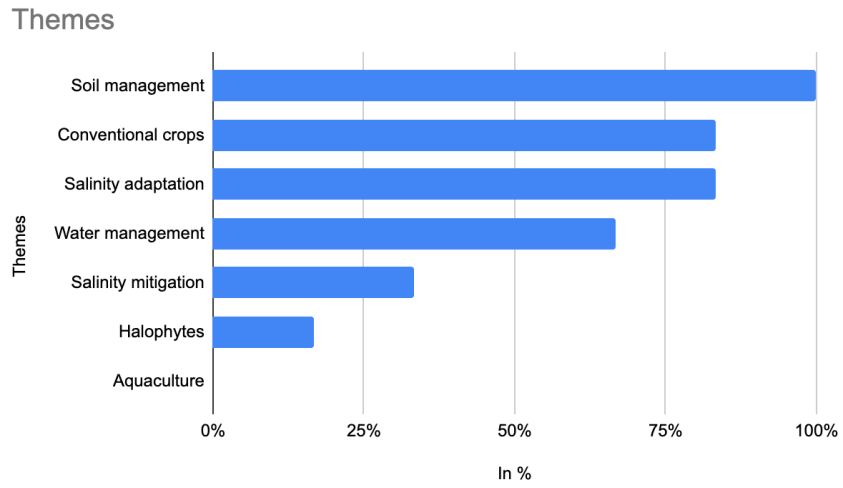


***Figure 8:*** *Focus themes of initiatives.*

With respect to the thematic focus of the initiatives, it is evident that all of them address the subject of soil management to some extent. The second most prevalent themes are conventional crops and salinity adaptation, each accounting for 83% of the initiatives. In contrast, the focus on salinity mitigation is notably less, with only 33% of initiatives concentrating on this aspect. While 67% of the initiatives prioritize water management, the focus on halophytes is rather limited, with only 17% of the initiatives addressing this subject.

#### *4.2.2. Assessment of entry points of Saline Agriculture into university and TVET curricula*

The survey among the universities and research institutes in Mozambique revealed that there is no separate course on Saline Agriculture existing in the country. Instead, basic conventional elements of salinity assessment and management are taught within courses on general soil assessment or agricultural programmes. Following up on this initial survey, the Action Workshop served as a platform

to assess suitable entry points to strengthen Saline Agriculture capacities in the frame of the existing educational structure (cf. 4.3.).

### 4.3. Action Workshop

Initially planned for mid-November, the in-person workshop in Mozambique had to be postponed due to the extensive post-election demonstrations and strikes which would have posed a serious risk to a successful implementation of the planned activities. Eventually, the workshop was conducted from February 5th-7th. It was preceded by intensive planning and preparation of the two field sites (i.a. salinity assessments, mobilisation of local farmers and community representatives, land clearing, acquisition of planting material). The latter tasks were principally coordinated by IIAM, ABIODES and ASSAMBA. A total of 36 participants were registered, including project representatives (cf. annex IV).

Picking up on the format and topics of the kick-off webinar, the seminar day was structured around a number of technical presentations, principally sharing previous Saline Agriculture experiences from Mozambique and Eastern Africa. This was complemented by interactive sessions on Policy and Partnership Discussions as well as Curricula Development (led by UEM and VU), and a visit to the IIAM soil laboratory (cf. Figure 9; see Annex III for the full workshop programme). During the workshop, a brainstorming session facilitated an open dialogue on the outcomes of the initiative mapping task, bringing together participants to exchange ideas in an interactive setting. Participants were divided into four groups to discuss key topics, including the impacts of salinity, adaptation and mitigation strategies, national governance of salinity and international cooperation, and community engagement and local knowledge integration. The outcomes of these discussions were later presented in a plenary session, offering deeper insights into the underlying challenges of salinity in Mozambique. This served as a basis for the Training Module Concept Development presented in section 4.5.

Practical activities on each of the two field days included participatory agro-ecosystem analysis, comprising soil profile description, salinity assessments, training on the Land Degradation Surveillance Framework (LDSF) methodology, and conceptualisation of suitable agroforestry cropping schemes for the respective locations. These components were led by The Salt Doctors and external experts from CIFOR-ICRAF (cf. Figure 10+11). As the weather conditions during the current rainy season prevented access to the initially selected field location in Marracuene, an alternative location in Maputo KaMubukwna with similar biophysical characteristics was spontaneously selected and prepared by ABIODES. The outcomes of the participatory site analysis and planned next steps for the field pilots at the two project locations are outlined in section 4.4. The workshop was met by positive feedback from the participants, which was reflected by a consistently strong participation across the three workshop days.

***Figure 9:*** Workshop day 1, seminar presentations.

***Figure 10:*** Workshop day 1, group work and visit to the IIAM soil laboratory.

***Figure 11:*** Workshop day 2, practical field work at the alternative field location in Maputo KaMubukwana.

***Figure 12:*** Workshop day 3, practical field work at the RESADE Best Practice Hub in Moamba.

### 4.4. Saline Agriculture Field Pilot

First, the soil profile of the upper 100 cm was assessed, with the help of the toolkit of The Salt Doctors. It is important to understand the soil characteristics and the soil salinity levels at different soil depths. The first 15 to 20 cm was loose, dry soil, which after addition of water proved to be heavy clay soil. This was followed by heavy clay (dark gray) up to 40 cm. From 40 to 100 cm, the soil was also heavy clay, but characterized by a light gray blueish color. Soil salinity was assessed with a Fieldscout handheld sensor and calibrated results showed that soil salinity levels are in the range of 24, 26 and 28 dS/m ($EC_e$) for the 0-20, 20-40 and 40-100 cm layers, respectively. These soil salinity levels are extremely high and need to be reduced in order to ensure good germination and good yields. This can be achieved by leaching (adding water to the soil above field capacity so that water will leach to deeper

soil layers, taking excess salts with it). But leaching heavy clay soil is constrained by its limited water infiltration capacity. Additional drainage is required to lower soil salinity levels. The local farmers shared some of their experiences and a common approach is to create a layer of reed stems under the cultivated soil in order to increase the drainage capacity. This seems to be a good way to reduce soil salinity levels indeed, although it might be difficult to scale up this practice to larger areas (very labour intensive). Reeds, but also *Sesbania sesban* (a highly tolerant shrub species) is commonly available around the location. Together with the workshop participants, several options for the pilot were discussed. The local practice (a layer of reed stems) will be included in the pilot, as well as the stems of the Sesbania and mix that into the soil. This will help to create extra pores and should result in extra drainage. Additionally, raised beds can help to improve water infiltration and drainage. For this, beds of 40 cm width and 25-35 cm height will be created. A control treatment will also be included. This results in a total of three treatments: (1) raised beds with the straw/stems of reed and sesbania mixed into the soil, (2) raised bed on top of a layer of reed straw/stems, and (3) the control treatment. Each treatment should consist of 3 to 4 beds of at least 5 m length.

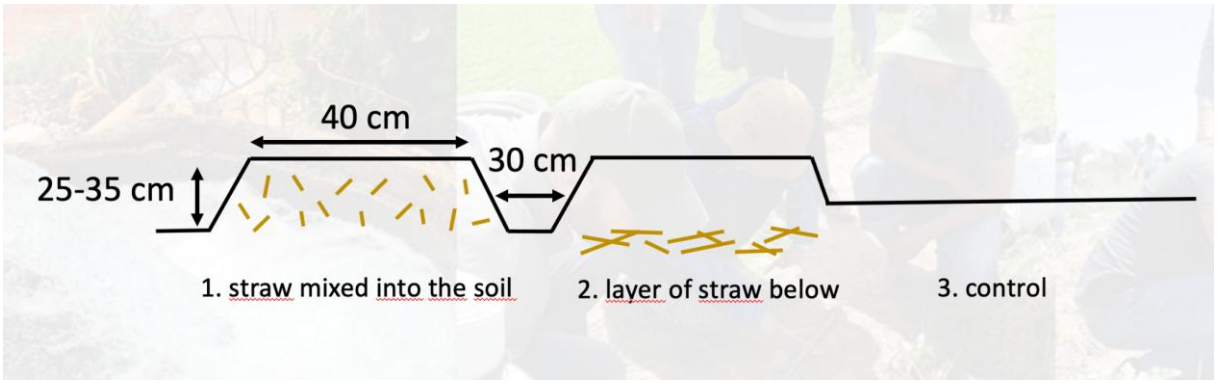


***Figure 13:*** Illustration of the 3 treatments to be applied in the field pilots.

The water quality was also assessed, demonstrating a variation of EC levels between 2,6 and 4,5 dS/m. The water with the lowest EC level is to be used for irrigation. But it is also the start of the rainy season and if the beds are created on short notice, then the rains can leach the excess salts and soil salinity levels should reduce significantly. As a first crop, it is recommended to plant beetroot (the most salt tolerant species of the seeds provided by The Salt Doctors). The beetroot should be planted with 25-30 cm space between two rows, so two rows on one bed. Within the row, seeds should be planted first at 3-6 cm apart, later to be thinned to 8-10 cm after seedlings are well established. Well decomposed compost can be used to enrich the planting line and create a microenvironment that is more favourable for the seeds (lower salinity levels, better drainage/aeration). As present, with the measured soil salinity levels, planting seeds will only result in very poor germination rates. So, soil management (raised beds and using organic inputs) is needed first, in order to reduce soil salinity levels. When soil salinity levels reach about 8 dS/m the seeds of the beetroot can be planted. It is recommended to collect soil samples every two weeks to assess the leaching effect and determine the timing for planting.

The above-outlined guidelines serve as a reference for the Mozambican project partners responsible for the effective field pilot establishment and monitoring in the course of the current cropping season (approx. March - August 2025): IIAM in Moamba, and ABIODES in Maputo KaMubukwana. Initial field preparations of the designed treatments have been carried out jointly by the workshop participants (cf. Figure 13). The Salt Doctors will provide continuous guidance, i.a. via regular virtual technical meetings. Additional to above-described cropping trial, the provided tree/shrub planting material (e.g. variety of bamboo species, *Acacia nilotica*, *Sesbania* spp.), was planted at the fields' margins, with the objective to test their growth performance under the local salinity levels and to assess their capacity for biodrainage and facilitated salt leaching (cf. Figure 14).

***Figure 14:*** First collaborative establishment of the field pilot treatments during the workshop.

***Figure 15:*** Initial planting of provided seedling of bamboo and other perennial species during the workshop.

### 4.5. Training Module Concept Development

The following training module concept was developed together with the training participants in the context of the Action Workshop, considering the assessed needs and experiences. As a next step, selected curricular contents such as the videos should be elaborated among experts but also potential students to test their educational value. Furthermore, dissemination opportunities should be explored to make the concept accessible to a wider audience. For this purpose, we are thinking of publishing a specific website on the VU channel. Finally, follow-up discussions are planned with representatives of the education sector to identify bottlenecks and opportunities for integrating the concept into appropriate curricula. It is intended to seek funds which will allow for testing and implementation of the developed training module concept together with the Mozambican stakeholders from the education sector, e.g. via the COST Action SUSTAIN or bilateral collaboration funds.

**Hybrid (online and on-site) Module Syllabus: Saline Agriculture and Agroforestry**
Study load: 2 ECTS

**Introduction**
Salinisation is a significant driver of soil degradation, posing a growing threat to agricultural productivity and environmental stability. Worsened by climate change, increasing soil salinity

endangers food and water security, contributes to biodiversity loss, and disrupts the livelihoods of farmers worldwide. As salinity continues to spread, innovative solutions are needed to sustain agricultural production in affected areas. One promising approach is Saline Agriculture, which involves the strategic management of soil, water, and plants to cultivate crops in saline conditions. When combined with agroforestry, this method can enhance resilience, improve soil health, and support sustainable farming in salt-affected landscapes.

The training module "Saline Agriculture and Agroforestry" aims to provide participants with a profound understanding of how Saline Agriculture and Agroforestry can contribute in their own ways to the transformation towards a more sustainable farming system enhancing biodiversity and farmers' livelihoods.

**Objectives**

By the end of this module, the participants should be able to:

1. **Understand the causes of soil salinity and map local community needs** related to them
2. **Measure soil salinity** using appropriate equipment and methods to assess the extent of salt-affected soils.
3. **Establish and monitor agroforestry systems** in saline soils to enhance soil health and agricultural resilience.
4. **Recommend best practices** for adaptation and mitigation techniques to manage salt-affected soils, considering the impacts of climate change.

**Target audience**

Students of technical institutes, universities, extension workers, with additional exercises for other stakeholders such as farmers

**Keywords**: soil salinity, water salinity, biodiversity, saline agriculture, agroforestry

**Content**

The structure of the module outlined in the matrix below. It will be an interactive hybrid module comprising theoretical introduction and practical exercises featuring transdisciplinary topics.

| **Main topic and online introduction** | **Practical exercise for students** | **Practical exercise for farmers** |
|---|---|---|
| Introduction to salinity causes and consequences | 1. List main causes and consequences of salinity<br>2. Assess the impacts of soil salinity in the chosen area | 3. Discuss needs of the local community in terms of environmental, economic, social consequences of salinity |
| Soil salinity assessment | 1. How to collect the soil sample? - watch the video and follow a | |

| | | |
|---|---|---|
| | standard operating procedure protocol<br>2. How to prepare a soil sample for the analysis? - identifying equipment for taking measurements in the lab and in the field and following the protocol<br>3. How to interpret the result? - relating the result to standard thresholds and interpreting the consequences | |
| Biodiversity and agroforestry | 1. Create an inventory of tree diversity - survival of the trees and their growth<br>2. Design optimal tree and crop mix for the chosen area using available resources | 3. Create an inventory of tree diversity - survival of the trees and their growth |
| Best practices for adaptation and mitigation techniques | 1. Evaluate current soil, water and plan management practices<br>2. Propose what can be improved in the future given the climate change<br>3. Discuss initiatives and policy support | 1. What irrigation technique is best for the chosen area?<br>2. What soil management techniques can be beneficial in the future? |

**Structure**

Each topic covered in the module will include an introductory 20 min video available in an online environment. The video will be supplemented with instructions for practical exercises for two target groups listed above.

**Indicative division of module hours**

| **Activity Hours** | |
|---|---|
| Session attendance | 2 |
| Readings | 10 |

| | |
|---|---|
| Preparing practical exercises | 28 |
| Preparing and taking the assessment | 16 |
| TOTAL | 56 |

**Assessment**

To pass the module, participants must prepare a short video (16 min) presenting their execution and results of exercises from all four sections and obtain an overall grade of at least 5.5 (out of 10) for their video.

**Literature**

Barrett-Lennard, E. G. (2002). Restoration of saline land through revegetation. Agricultural Water Management, 53(1-3), 213-226.

Gheyi, H. R., da Silva Dias, N., de Lacerda, C. F. & Gomes Filho, E., eds. (2016). Manejo da Salinidade na Agricultura: Estudos Básicos e Aplicados, 123–148, INCTSal, Fortaleza.

Hardie, M., & Doyle, R. (2012). Measuring soil salinity. Plant salt tolerance: methods and protocols, 415-425.

Negacz, K., Vellinga, P., Barrett-Lennard, E., Choukr-Allah, R., & Elzenga, T. (2021). Future of sustainable agriculture in saline environments (p. 541). Taylor & Francis.

de Vos, A., Bruning, B., van Straten, G., Oosterbaan, R., Rozema, J., & van Bodegom, P. (2016). Crop salt tolerance under controlled field conditions in The Netherlands, based on trials conducted at Salt Farm Texel. Salt Farm Texel.

Young, A. (1989). Agroforestry for soil conservation.

### 4.6. Technical Network Building and Outreach

The webinar and workshop interactions effectively fostered many new professional connections, most notably between actors from the Dutch and Mozambican water and agri-food sectors. New links were established, for example, to institutions like Resilience, Smart Farming, Harmonergy, IRRI and CIP. But also regional networks between experts from Eastern Africa were strengthened. Most importantly, this concerned the in-depth collaboration with CIFOR-ICRAF in the context of MoSARP which opened new opportunities for continued collaboration between CIFOR-ICRAF and IIAM on the topics of Agroforestry and soil research. Further regional networks were established to the DiDEM project and Blue Carbon Tanzania.

In order to facilitate continued interaction and knowledge exchange across these newly established networks, a Saline Agriculture working group has been set up on the ANW platform, principally focussing on the Eastern and Southern African (ESA) region and thus strengthening the recently initiated ESA Saline Agriculture Network. It is open to all project stakeholders and the wider interested public. All digital project outputs, e.g. presentations, reports, publications, etc., are made accessible via the platform. Weltweit will make efforts to stimulate continuous interaction in the working group via active community management beyond the project timeframe. Furthermore, links and synergies with NFP Connects will be explored.

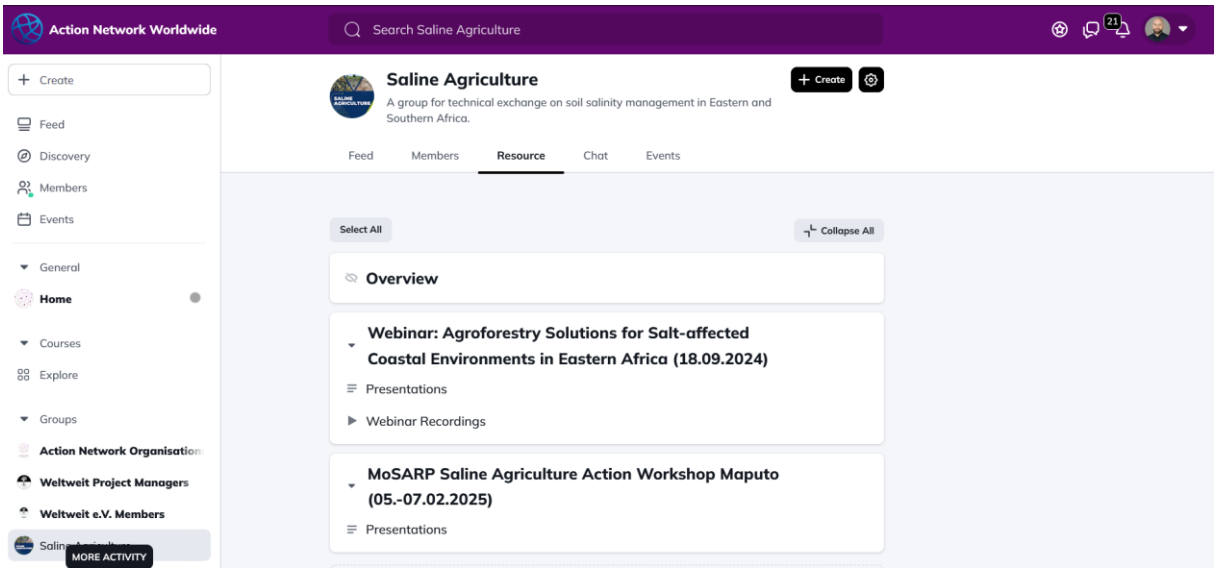


***Figure 16:*** Screenshot of the newly established Saline Agriculture Working group on the ANW platform.

Dissemination of project info and results is achieved via the various public relation channels of the consortium partners. Up to date, the following social media posts have been published:

LinkedIn: Webinar on Agroforestry Solutions for Salt-Affected Coastal Environments in Eastern Africa

LinkedIn: Blue Carbon Tanzania contribution to the Webinar

LinkedIn: The Salt Doctors' reflections on the Action Workshop

Further social media posts reflecting on the Action Workshop are currently being prepared; while a continuous documentation of the ongoing field pilots is envisioned. Additionally, positioning of project experiences on the websites of VU, The Salt Doctors and Weltweit, etc. are planned for the nearer future, along with an entry in the Saline Agri Map.

Lastly, we had the chance to present MoSARP and inform about the problem of salinity in Eastern Africa at the Tropical Summit 2024 by means of an oral presentation, as well as learning from sister projects during a SW&FS Partnership workshop in December 2024. Both of which allowed for additional visibility of the project's efforts and further networking opportunities.

## 5. Conclusion and Outlook

As indicated in the previous section, several project activities are still ongoing, partly delayed due to the recent political situation which hampered project implementation. Hence, some of the intended outputs are still pending. This refers specifically to the monitoring of the field pilots, as well as data processing, publishing of the project's outputs including the training module concept, and a final meeting with the Dutch Embassy in Mozambique to discuss the project's outcomes. Despite these hindrances, we assess the project as successful, as we are about to deliver all of the expected outcomes. The team is committed to jointly work on the pending deliverables beyond the formal project timeframe, in the course of the coming months, as outlined in the following table.

| Deliverable | Activities | Timeframe |
|---|---|---|
| Meeting with the Dutch Embassy in Mozambique | A virtual meeting, facilitated by NFP/NWP, to discuss the project's results and possibilities for follow-up and scaling. | March/April 2025 |
| Field pilot monitoring | The Salt Doctors are going to provide a concrete trial protocol to the Mozambican partners, along with technical guidance throughout the cropping period from approx. March - August 2025. IIAM and ABIODES will ensure trial maintenance and monitoring. Additionally, farmers will be supported to run own small-scale trials on their plots. | March - August 2025 |
| Training module concept | VU will create a website featuring the project's outcomes, including an outline of the training concept design. Furthermore, virtual follow-up discussions with representatives of the Mozambican education sector are to be conducted, in order to identify bottlenecks and opportunities for integrating the concept into appropriate curricula. A VU MSc student will write a thesis on the topic related to this project to further capitalise on the findings. Lastly, it is intended to seek funds which will allow for testing and implementation of the developed training module concept in Mozambique, and possibly other countries in the region, e.g. via the COST Action SUSTAIN or bilateral funding. | March - April 2025 |

These efforts will benefit from synergies with complementary projects which have recently been secured, e.g. support of the Best Practice Hub in Moamba via the ProCava project and a Farmer Field School programme to be implemented by ABIODES in Maputo KaMubkwana. Furthermore, the newly established networks in the context of MoSARP will provide fruitful ground for follow-up (Saline Agriculture) initiatives in Mozambique. The following table gives an overview of possible leads that resulted from, or were developed further, via the interactions under the MoSARP project.

| Perspectives | Institutions | Description |
|---|---|---|
| Operationalisation of the ESA Saline Agriculture Network | Weltweit e.V. | The ESA Saline Agriculture Network was initiated by Weltweit in 2023, following up on initial regional networking activities in the context of the SaliHort project. Its objective is to foster knowledge exchange between Saline Agriculture actors in Eastern and Southern Africa and thus to capitalize on existing expertise and capacities in the region. As previous fundraising efforts haven't been successful, network activity relies primarily on voluntary initiative. MoSARP provided further impulses for vitalizing network interactions (mobilization of new actors, initiation of the |

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|---|---|---|
| | | working group on the ANW platform, etc.) and provided leads for future support. One opportunity to be explored is a collaboration with the SW&FS partnership and the NFP Connects platform. |
| Research on salinity impacts in rice production systems of Central Mozambique | IIAM, UEM, Martin Luther University Halle-Wittenberg | MoSARP provided an ideal platform for establishing profound working relationships between Mozambican and German research institutions. Based on these, a new research collaboration on salinity dynamics in rice paddy soils of Eastern Africa is currently being set up, with field research to be realized in Central Mozambique. First data collection activities are planned for mid-2025. |
| A Saline Agriculture pilot project in Zambezia province | The Salt Doctors, private sector partners | This project, initiated in early 2025, equally benefited from synergies with the MoSARP project. A first demonstration trial was set up in the field. Practical training and trial follow up are to be provided in the course of 2025. |
| Strengthened scientific collaboration with CGIAR centers on soil analyses and agroforestry | IIAM, CIFOR-ICRAF | The involvement of CIFOR-ICRAF experts in the webinar and workshop activities of MoSARP allowed IIAM to strengthen its relationship with this CGIAR center. An immediate opportunity for collaboration was discussed with regard to the introduction of modern soil spectroscopy technology, where CIFOR-ICRAF could facilitate required regional expertise in the context of an ongoing FAO-IIAM project on improving soil analysis capacities and spatial soil data in Mozambique. Equally, collaboration opportunities in the field of agroforestry via CIFOR-ICRAF's office in Malawi are being assessed. |
| Applied projects on agroforestry-based land restoration | ASSAMBA, ABIODES | Also the project's NGO partners benefitted from new contacts, with prospects for collaborative action in terms of applied land restoration projects in Mozambique. Concrete opportunities have been discussed between ASSAMBA and Harmonergy (agroforestry / syntropic agriculture), as well as ABIODES and CIFOR-ICRAF (strengthening farmers' access to soil analyses services). |
| Policy lobbying for strengthening Saline Agriculture research and action in Mozambique | VU, IIAM | Unfortunately, the invitations for workshop participation extended to representatives of politics (e.g. agricultural ministry of Mozambique) were poorly accepted. Hence, effective police dialogue and lobbying was rather restricted in the context of MoSARP. We hope that the planned meeting with the Dutch Embassy in Mozambique might open up alternative entry points for awareness raising and dialogue at the policy level. |

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