

Saline Farming

Saline Farming - Innovative agriculture to protect the environment and stimulate economic growth

This is the very long title of our project, but don't worry, we just call it "SalFar". The SalFar project deals with climate change and sea level rise and the challenges this raises for farming and agriculture across the North Sea Region. After two years of planning and intensive discussions within our partner consortium, the project SalFar was approved in June 2017 by the Interreg VB North Sea Region Programme Steering Committee.

We started immediately with the preparation of the kick-off meeting at the University of Lincoln, UK. Next to a number of interesting discussions and presentations on climate change issues, degradation of farmland, economic loss due to salinization, and salt tolerance of certain crops, we went for an adventurous excursion through the area of "The Wash", where farmers started to rescue parts of their land which had been flooded a year before.

In particular for the Belgian, Dutch, and German colleagues, this was a cultural shock: farmers who have to protect their land themselves against flooding? No "waterschap", no regional or national authorities who are in charge of flood protection? A few jokes were made on "Brexit" and that this would be one of the consequences the poor British had to suffer. But, of course this was the basis for a much more serious discussion, namely: how to deal with rising sea levels? Can we afford to continuously upgrade our dykes to protect the low areas of our countries? What are we going to do about increasing ground-water salinization? How can we protect the roots

of our crops and plants? Are there any crops that can resist or have a higher tolerance against salt? What are the policies for coastal protection, agriculture and water management in Denmark, Sweden, Norway, the UK, Belgium, The Netherlands and Germany? These are the questions we are working on and want to find solutions for within the project "SalFar". We, that is the following partner consortium from seven countries around the North Sea:

- Province of Groningen, Groningen, NL
- Stichting de Zilte Smaak, Terschelling, NL
- Waddensea Academy, Leeuwarden, NL
- Salt Farm Foundation, Texel, NL
- SPNA Aggroreasech, Kollumerwaard, NL
- Ökowerk Emden, Emden, DE
- VIFU - Videncenter for Fødevareudvikling, Holstebro, DK
- Smagen af Danmark, Holstebro, DK
- University of Gothenburg, SE
- Norwegian University of Life Science, Ås, NO
- University of Lincoln, Lincoln, UK
- ILVO, Merelbeke, BE
- Vlaamse Landmaatschappij, Brugge, BE



Kick-off meeting SalFar in Lincoln, UK. September 2017

Left to right above: Carina Rietema, SPNA (NL), Dorte Storper, VIFU (DK), Detlef Stang, Ökowerk Emden (D), Laurids Christensen SaD (DK), Isobel Wright, UoL (UK), Ute Ahrens, ARL (D), Flang Cupido, Hans Wiimink, SDZS (NL), Wim van Isacker, VLM (B), Iain Gould, UoL (UK)

Left to right under: Marc van Rijsselberghe, SFF (NL), Johanna Lethin, UoG (SE), Angelica Kaus, PG (NL), Åsgeir Aimas, NMBU (NO), Bas Bruining, SFF (NL), Arjen de Vries, ZPB (NL), Willeke Aapkes, SFF (NL), Susanne Eich- Greateorex, NMBU (NO), Anne M. Asselin de Willencourt, NMBU (NO), Jeroen de Waegemaeker, ILVO (BE), Olof Olsson, UoG (SE), Douwe van Noordenburg, PG (NL)

The project SalFar is funded by the Interreg VB North Sea Region Programme under priority 2 “Eco-innovation: Stimulating the green economy”, and more specifically under priority 2.1 “Promote the development and adoption of products, services and processes to accelerate greening of the North Sea Region”.



Farmers self-help in “The Wash” area, UK

A core activity of the SalFar project is WP 4 “Living Labs for Saline Farming: new products, services and processes” led by Prof. Henrik Aronsson from the University of Gothenburg (unfortunately not in the picture above). After preparing diverse field trials in the winter season, we will set-up open field labs in each participating country in early March to test the salt tolerance of certain crops. The SalFar scientific committee will first define the crops and plants to be tested and protocols to be followed. Within our multi-disciplinary partnership, knowledge and expertise on various fields will be shared. Microbiologists, biochemists, experts on soil and climate, farmers and entrepreneurs, economists, geographers, hydraulic engineers, and political scientists will analyse and compare the results from the work packages.

Defined Work Packages and their leaders

WP 1 Project Management (Province of Groningen, NL)

WP 2 Communication (VIFU, DK)

WP 3 Baseline study Saline Farming (University of Lincoln, UK)

WP 4 Living Labs for Saline Farming: new products, services and processes (University of Gothenburg, SE)

WP 5 Business strategies for innovative food production (Taste of Denmark, DK)

WP 6 Awareness raising, capacity building and governance (VLM, ILVO, BE)

SalFar Open Fields Tests

In the SalFar project, we are dealing with three different kinds of open field labs to test the salt tolerance of crops and the cultivation of plants that grow naturally under saline conditions:

- 1) Tests using strict scientific protocols
- 2) Tests to demonstrate what will happen to plants under various conditions
- 3) Tests in areas that have been naturally flooded

One of our partners, the Ökowerk Emden, has already started its pilots as “demonstrations” i.e. trials without strict scientific protocol. They set up two test fields with *Salicornia* and *Cochlearia* on flooded areas. Plants of *Salicornia europaea* were first raised in pots in the greenhouse and planted on open fields in August. In October 2017, the area was covered with a 5 cm layer of salty mud. This test will show, whether the natural regrowth of *Salicornia* by seed is feasible under these conditions and if the test field can be used as production unit in 2018. *Cochlearia officinalis*, “scurvy grass”, is covered with salty mud, in permanent extremely wet soil and developing well under these severe conditions. This test will show, whether *Cochlearia* is able to survive winter time, whether there is a difference in taste of the leaves compared to the plants grown in the greenhouse with artificial salinization. It also should give an indication about the flowering time in the

open field compared to the greenhouse. *Cochlearia* contains a high level of vitamin C, is antiscorbutic, aperient, disinfectant, diuretic and stimulant.



Pictures from Ökowerk Emden - test fields with *Salicornia* and *Cochlearia*.

Duration: June 2017 - December 2021

Total Budget:	6.147.375 €
ERDF Funding:	2.760.633 €
Norwegian funding:	313.055 €

Members of the Scientific Committee are:

- Prof. Henrik Aronsson, University of Gothenburg
- Dr. Åsgeir Rossebø Almås, Norwegian University of Life Sciences
- Dr. Bas Bruning, VU Amsterdam, Salt Farm Foundation Texel
- Dr. Iain Gould, Lincoln Institute for Agri-Food Technology
- Prof. Olof Olsson Lund University
- Carina Rietema MSc, SPNA Agro Research Kollumerwaard
- Prof. Pier Vellinga, Waddenacademie
- Dr. Jeroen de Waegemaeker Msc, ILVO
- Ko Munneke MSc, Provincie Groningen

Raising Awareness

An important part of the SalFar project is to raise awareness about climate change issues in agriculture. Farmers know about salinization and that this is a danger for their land. But they do not like to talk about it. Degradation of farmland by salinization is a hot item as prices will decrease significantly per ha when salt groundwater or flooding with saltwater comes into the picture. On the other hand, the costs for constantly heightening the dykes and other measurements for coastal protection are rising continuously. On the longer run, nobody can pay for this anymore. This is why the project SalFar is trying to find alternatives for farming in low lying coastal regions. To discuss the problem with regional stakeholders, like farmers, entrepreneurs, local and regional authorities we organise seminars and workshops as well as farmers' cafés, where concrete situations can be discussed in an informal setting.

Very important: the involvement of regional and national stakeholders from each participating country. This will be done by workshops and seminars, farmers' cafés and excursions to create space for the exchange of knowledge, in-depth discussions and mutual learning. A mid-term conference will be organised in June 2019 to present first results on testing the salt-tolerance of crops. The project will end with a final conference in September 2021. For further information, please see our website: <http://northsearegion.eu/salfar>.

At SPNA Agro Research Kollumerwaard the following picture was drawn to give an idea for innovative agriculture on saline grounds.



The picture was drawn at SPNA Agro Research Kollumerwaard to give an idea for innovative agriculture on saline grounds.

Read more:

www.northsearegion.eu/salfar

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Dissemination of knowledge

Communication with local, regional and national authorities and their advisory boards is very important. This is why we will also do a policy analysis for all the seven coastal regions participating in SalFar. Different attitudes towards climate change issues and how to deal with these challenges determine the policies on coastal protection and agriculture on all levels. Dissemination of knowledge on these issues will take place also in seminars and workshops for local, regional and national authorities to stimulate rethinking water management and farming in lower coastal regions. If these authorities understand the economic impact of salinization of farmland, different views will develop on this subject. The project SalFar wants to stimulate this development by the creation of living labs on saline farming, where experiments with new products, services and processes will take place to offer alternative business models for coastal agriculture.

In addition to the website, we developed various communication tools, like leaflets and posters which you will find at each partners' premises. Activities like farmers cafés, workshops and seminars will take place in all participating regions and knowledge will be exchanged among our international scientists circle. Citizens and tourists as consumers of food were approached in particular by the partners Ökowerk Emden and Stichting de Zilte Smaak Terschelling. Visitors of these centres could pick their Salicornia or Sea Aster and were given recipes for the use of them. Cooking workshops and tastings were organized, where people could try new products, like Salicornia Chutney, Cochleria pasta, or strawberry sea aster jam for instance. The Stichting Zilte Smaak even received an award by the province of Friesland for the "Salty Garden" they set up and for promoting innovative "terroir"-based food products.



Celebrating the award



Field of Sea Aster Stichting De Zilte Smaak

Co-operation with regional stakeholders in the Netherlands

Over the last few months the Waddenacademy has supported the University of Applied sciences, van Hall Larenstein in Leeuwarden to create a "Salt Campus". Plans are made to set up a "living lab" for teaching and experiments at regional level, together with farmers and entrepreneurs. SPNA and Zilte Smaak Terschelling, two of our Dutch Salfar partners have joined this initiative. As a first "spin-off", a project proposal with 10 partners participating from the public and the private sector has been submitted

to the funding organisation "Waddenfonds" at the end of January. The activities so far have focussed on the province of Friesland but parties from Groningen and Groningen University participate as well. In fact it is open to all interested parties, including international parties. As part of the Salfar project, the Waddenacademie is supporting this initiative with the aim to strengthen education and research on salt tolerant agriculture in the region. Further information: pier.vellinga@waddenacademie.nl.

Fresh water shortages? A hot topic!

Findings from the seminar "Sustainable water management in the polders" in Belgium

On 9 October 2017 the Flemish Land Agency (Vlaamse Landmaatschappij) hosted the seminar '**Sustainable water management in polders**'. Co-organizers were the Province of West-Flanders, Ruimte Vlaanderen and Vlaamse Milieumaatschappij (the policy departments for spatial planning and water management at the regional level). The seminar addressed sustainable water management in the Flemish coastal region, also known as the polders. In particular, the focus lay on the region's long-term development within a context of ever increasing fresh water shortages, the result of climate change.

The seminar puts the aims and the temporally results of three Interreg-projects in the spotlight. These Interreg- projects each address the water management in the coastal region, yet from diverging perspectives.

- **SCAPE** - Shaping Climate change Adaptive Places. An Interreg 2 Seas-project that employs the landscape as a starting point for innovative solutions on water management. The aim is to make the coastal areas (rural, urban or peri-urban) more resilient to impacts of climate change.

- **Topsoil**. An Interreg North Sea-project that wishes to maximize the transferability of fresh water solutions by exchanging knowledge and expertise in the transnational partnership. In the Flemish case the focus lies on subsoil storage of surface water and the extensive mapping of salt water intrusion.

- **SalFar** - Saline Farming, our project that aims to explore the strategy of saline farming and to build up public support for the innovative agricultural strategy.

The seminar was tailored to the local stakeholders; the water boards, the farmers organizations, the organizations for nature conservation and the local municipalities. **And more than a hundred participants showed up!** Despite the seminar's focus on fresh water shortages, an issue that received little attention in the past decades. This high turn-out was partly caused by a renewed sense of urgency, the result of an exceptional drought period in the summer of 2017. For the first time in decades, there was a need for emergency measures, such as a temporary ban on the use of surface water for the irrigation of agricultural land, or a temporary ban on the use of drinking-water for washing cars, and irrigating private lawns. In addition, inland navigation was halted since water-levels dropped and therefore, safe shipping could not be guaranteed. These emergency measures were in place for more than two months: from the 13th of June until the 18th of August. The risk of salinization steered the evaluation of these crisis-management measures.



VLM seminar "Sustainable water management in the polders", October 9, 2017

Please feel free to contact the project managers if you need any further information

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