NORTH EUROPE "4 PER 1000" REGIONAL MEETING

HELSINKI

FINLAND

6 TO 8 JUNE 2023

4 PER 1000
SOILS FOR FOOD SECURITY AND CLIMATE

BSAG
Baltic Sea Action Group

MAIN MESSAGES OF THE REGIONAL MEETING FORMULATED FOR COP28

A few main messages to be presented at UNFCCC COP28 in Dubai in December 2023 were formulated at the meeting. The messages are as follows:

- Soil is the essential base of food production. It is impossible to produce enough good-quality food, locally or globally, without healthy soils.
- Now, soils are degrading, and actions are needed to regenerate soil health urgently. This has also been recognized within the European Union.
- In this context, knowledge transfer, peer-to-peer learning, and more advisory services on rebuilding soil health are on the first importance.
- Despite some indisputable improvements, the current Common Agricultural Policy (CAP) seems insufficient. The next CAP has to be more ambitious to ensure more rapid transformation.
- Reliable, state-of-the-art monitoring, reporting, and verification (MRV) system for soil carbon, is needed, as well as to keep in mind the other benefits of improving soil health and increasing biodiversity in agriculture.

More detailed messages are in section 6 of the report.

1. INTRODUCTION

1.1 RATIONALE – WHY DO WE NEED STRONGER COLLABORATION AT REGIONAL SCALE TO PROMOTE SOIL HEALTH AND CARBON SEQUESTRATION?

Sequestering carbon in the soil is a central lever to many of today's most severe challenges. By increasing carbon stocks in the soil and improving soil health, we can remove carbon from the atmosphere to help mitigate climate change, but at the same time improve resilience to the effects of climate change and increase food security. Soils rich in organic matter promote biodiversity, reduce sediment and nutrient input to water bodies and make agriculture less dependent on industrial fertilizers. In brief: there are multitudes of benefits that come with carbon-rich and healthy soils. Since 2015, the International "4 per 1000" Initiative therefore actively promotes action at all levels to increase soil health and soil carbon sequestration.

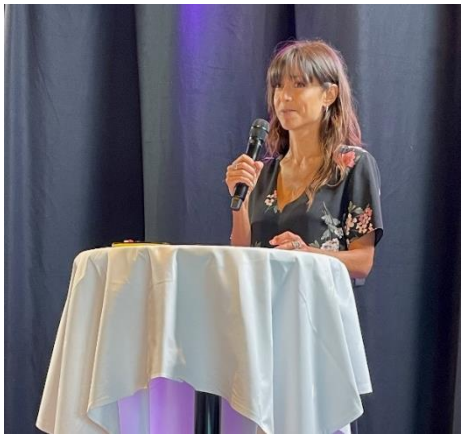
When it comes to soils, there is no one-size-fits-all solution. Soil properties and climatic conditions but also the socio-economic setting heavily influence which management decisions will be the most effective to increase soil health – and which will be feasible for farmers.

It is more than time to change the way we produce and consume agricultural commodities, a change that requires all hands on deck and has to be driven by all stakeholder groups simultaneously. However, this kind of transition requires information and knowledge, as well as needs and requirements are shared beyond stakeholder groups: to know what is possible, what is needed, and what is likely to be successful. Creating strong regional networks is a crucial component for a continuous exchange and to establish hands-on cooperation.

The "4 per 1000" regional meeting therefore brought together over 300 actors from real-world farming, research, policy making, and business from over 30 countries from Northern Europe and beyond. During two conference days with over 50 speakers and a day of excursions, participants got the chance to exchange about how to shift to regenerative, productive, and resilient agriculture. In the beautiful setting of early-summer Finland and thanks to the extraordinary engagement of the Baltic Sea Action Group to co-organize this meeting, the conference provided a real opportunity to explore what this transition can look like at all different levels.

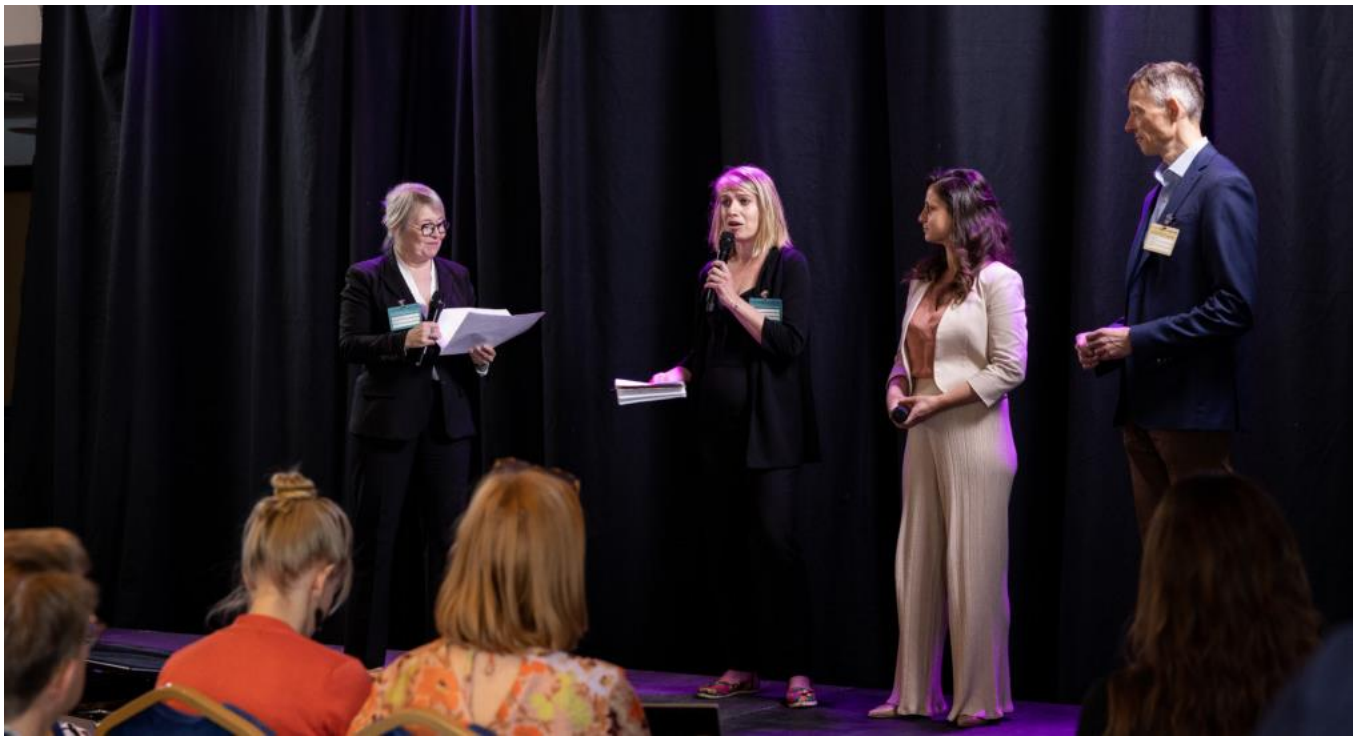
1.2 BACKGROUND

The people behind the idea for the regional meeting, BSAG Managing Director, **Laura Höijer** (Finland) and Executive Secretary of the "4 per 1000" initiative, **Paul Luu** (France) welcomed all participants under the chairmanship of **Gabrielle Bastien**, Vice-President of the "4 per 1000" Initiative. On this occasion, it was recalled that Finland was one of the first countries to join the initiative in December 2015, so it made sense to hold this regional meeting in Helsinki. It was also pointed out that BSAG, which has long worked in collaboration with "4 per 1000" and the Finnish Meteorological Institute, has managed a project in the Finnish Ministry of Agriculture and Forestry's "Catch the Carbon" program (project FIN SOIL ACTION 2021–2023), aimed at stimulating collaboration with "4 per 1000" in Finland. The Northern Europe Regional Meeting was funded by the "Catch the Carbon" program, the Strategic Research Council of the Academy of Finland and the "4 per 1000" initiative, as well as by the Maj and Tor Nessling Foundation, EIT Food and the Helsinki-Uusimaa Regional Council. The funders and partners of the Regional Meeting welcomed the audience with brief speeches.



1.3 SETTING THE SCENE

After welcoming words by Laura Höijer and Paul Luu, a video message by **Virginijus Sinkevičius** (Commissioner for the Environment, Oceans and Fisheries, EU Commission) followed. Mr. Sinkevičius explained that the EU is finalizing a legislative proposal for a new soil health law to help improve soil health by 2050. The law will help monitor, define, and improve soil health to support climate objectives, food security, and resilience. The proposal will build on existing soil monitoring structures, allowing flexibility for member states. Mr. Sinkevičius concluded his speech by affirming that the European Commission will join the "4 per 1000" Initiative.



Representing the EU Commission as well, **Magda Kopczynska** (Directorate-General for Agriculture and Rural Development, EU Commission) spoke on the EU Mission: A Soil Deal for Europe, which aims to promote sustainable soil management through living labs, knowledge sharing, and best practices. She also briefly presented the EU's Common Agricultural Policy, which aims to provide support for soil health, carbon farming, and related initiatives. Magda Kopczynska (Poland) summarized the importance of soil in her speech: "If soil goes wrong, agriculture will not go right."

The Ministry of Agriculture and Forestry of Finland was represented by **Jaana Husu-Kallio** (Permanent Secretary). Ms. Husu-Kallio highlighted Finland's commitment to "4 per 1000" and investment into soil health related research and initiatives. She stressed the overall importance of healthy soils for farmers, food security, biodiversity, and climate change mitigation. She also spoke on the need to take into account regional differences in soils and involve farmers and researchers to find effective, practical solutions. As an example, Ms. Husu-Kallio briefly introduced the Catch the Carbon program.

Pia Tynys (Finland), Chief Advisor on Climate Change at the Helsinki Uusiamaa Regional Council, outlined the region's aims for carbon neutrality by 2030 and affirmed its commitment to the UN SDGs and the European Green Deal. She also highlighted the region's advanced R&D sector, which is producing innovations in regenerative agriculture, soil health, greenhouse gas emissions measurement tools and sustainable food systems.

Marja-Liisa Meurice (Director EIT Food CLC North-East) provided an overview of EIT Food's mission, activities, and partnership opportunities. The EIT Food mission promotes healthier food, net zero food systems and resilient/transparent supply chains. Their approach revolves around protein diversification, regenerative agriculture, and labelling, packaging and transparency. Ms. Meurice also introduced the European wide EIT Food Regenerative Agriculture Revolution project.

2. MEETING AGENDA

Overview table of the program of each day

June 6th - Plenary

13:00 - 14:00	Registration desk
14:00 - 14:15	Welcoming words
14:15 - 14:55	Opening speeches
14:55 - 15:20	Q&A session: EIT Food Regenerative Agriculture Revolution project – Challenges and success stories in development of regenerative agriculture in the Central and Eastern Europe
15:20 - 15:35	Inspirational speech: Carbon Action - showing that change is possible
15:35 - 16:10	Coffee
16:10 - 17:10	Panel discussion: Benefits, bottlenecks, and action
17:10 - 17:50	Farmer stories: Transitioning to regenerative farming
17:50 - 18:00	Trophic Verses – The soil of art
18:00 - 19:00	Posters & drinks
19:00 - 21:00	Dinner

June 7th - Plenary 1

08:30 - 09:00	Coffee
09:00 - 09:20	Plenary opening
09:20 - 09:30	Inspirational speech: Farmers as key players
09:30 - 09:40	Inspirational speech: The perspective of youth

- Parallel 1: Healthy soils for climate, biodiversity, and water protection

10:00 - 10:30	Keynote: Jena experiment – The interactions between plant diversity and ecosystem processes
10:30 - 11:00	Keynote: How biodiversity impacts the ability of fields to store carbon – results from the TWINWIN experiment
11:00 - 11:10	Comment: Farmer's perspective: Holistic approach on farm level
11:10 - 11:20	Comment: How to find win-win-win solutions by soil management?
11:20 - 11:30	Comment: EU Soil Observatory: Soil Health Knowledge to support the European Green Deal
11:30 - 13:00	Lunch & Networking
13:00 - 13:30	Keynote: Organic matter: a key component of soil health
13:30 - 14:00	Keynote: Soil health, water management and carbon sequestration on farms
14:00 - 14:10	Comment: The importance of advisory work in promoting soil health
14:10 - 14:20	Comment: Carbon farming with multiple benefits – Svensk Kolinlagring's four criterias for successful carbon sequestration
14:20 - 14:30	Comment: Measuring on farm outcomes of regenerative practices adoption

- Parallel 2: Soil carbon monitoring, reporting, verification – scientific basis for public and private incentives

10:00 - 10:30	Keynote: What could a soil carbon MRV framework look like
10:30 - 10:50	Keynote: Near-real-time GHG and soil carbon change predictions: A step towards NetZero
10:50 - 11:10	Keynote: Headline TBA
11:10 - 11:30	Keynote: Key insights from a multi-stream multi-model carbon calculator system
11:30 - 13:00	Lunch & Networking
13:00 - 13:15	Comment: How ICOS is responding to the needs of MRV systems
13:15 - 13:30	Comment: European Commission's Carbon Removals Certification
13:30 - 13:45	Comment: Carbon market company perspective
13:45 - 14:00	Comment: Sensing technology company perspective
14:00 - 14:15	Comment: Farmer's perspective
14:15 - 14:30	Comment: MaRVic: Towards a framework for the design of context-specific MRV systems for carbon farming

- Parallel 3: Parallel 3: Regional priority in Northern Europe: Agricultural organic soils

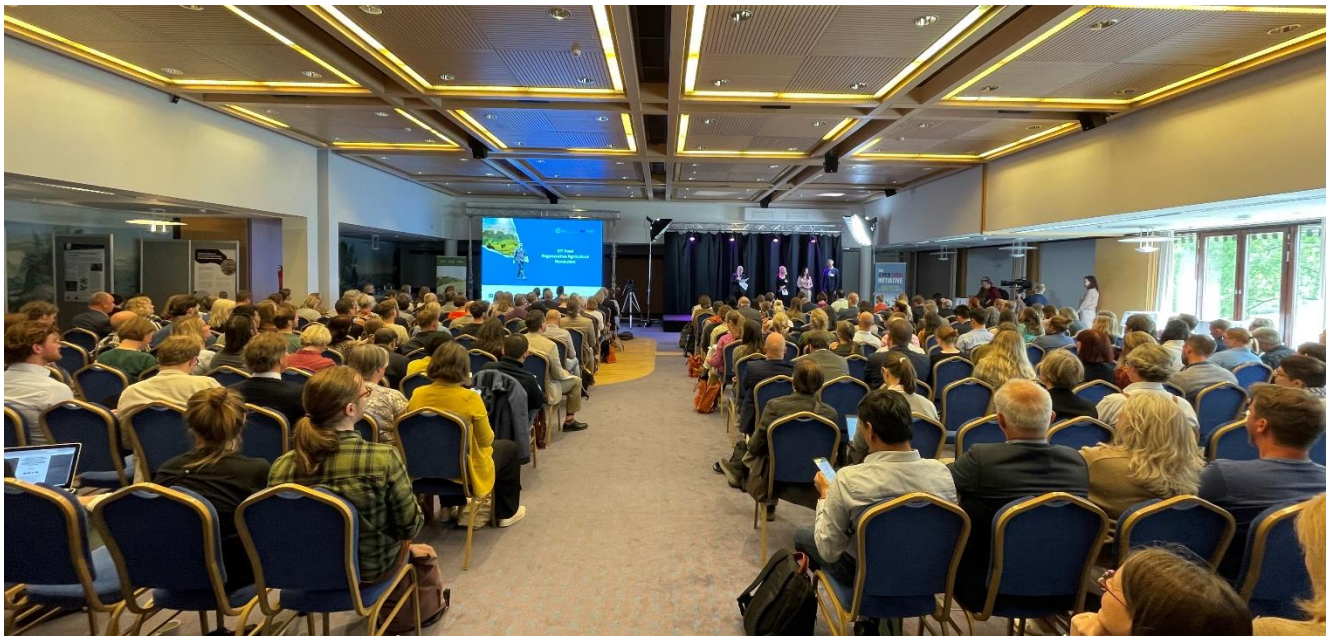
10:00 - 10:30 Keynote: Agriculturally used peatlands in Europe and their key role in EU Green Deal policies
10:30 - 11:00 Keynote: The importance of agricultural peat soils from Finland's perspective
11:00 - 11:10 Comment: European Green deal progress - Commission policy perspective
11:10 - 11:20 Comment: The complexity of agriculture organic soil management - LIFE OrgBalt project experience
11:20 - 11:30 Comment: Enhancing sustainable use of agricultural organic soils in Estonia
11:30 - 13:00 Lunch & networking
13:00 - 13:30 Keynote: Paludiculture – plenty of water reducing CO_2 emissions and sequestering carbon in soils and biomass in wet peatlands
13:30 - 14:00 Keynote: The importance of agricultural peat soils from Finland's perspective
14:00 - 14:10 Comment: How to consider climate benefits of rewetting peatlands in carbon farming schemes?
14:10 - 14:20 Comment: Farmer's Perspectives of Rewetting in the Midlands of Ireland - The FarmPEAT Project's experience
14:20 - 14:30 Comment: Finland's policy perspective
14:30 - 15:30 Coffee & posters

- Plenary 2

14:30 - 15:30 Coffee & posters
15:30 - 16:30 Concluding panel discussion
16:30 - 17:00 Main messages from the meeting & Closing the event

June 8th - Excursions

08:00 - 17:00 Qvidja farm, Parainen, South-West Finland
09:00 - 14:00 Viikki experimental sites, Helsinki



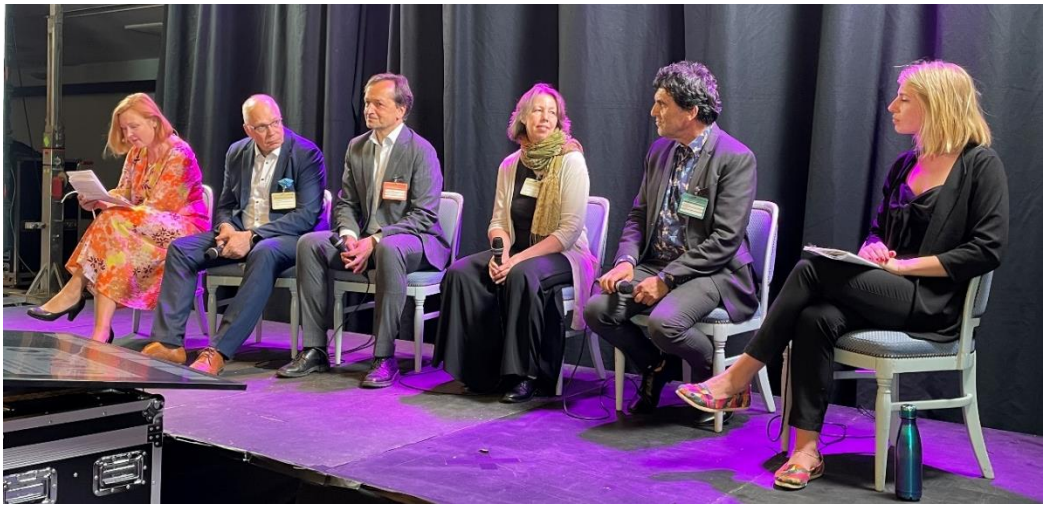
3. CREATING AN ENABLING ENVIRONMENT FOR THE AGRICULTURAL TRANSITION

3.1 APPROACHES AND NEEDS FOR FURTHER ACTION

EIT Food, one of the partners in organizing the event, brought the views of farmers from the Central and Eastern Europe to the stage with their Q&A session, shedding light on the development of regenerative agriculture in the area. **Václav Kurel** (Director, Carboneg Project, Czech Republic), **Lili Balogh** (President, Hungarian Agroecology Network Association, Hungary), and **Petya Ivanova** (Vertical Manager, Regenerative Agriculture Association of Bulgaria) provided insights in their work of helping farmers transitioning towards regenerative agriculture and exchanged on their experiences and main challenges. They agreed that changing farmers' mindset represents the greatest challenge for the transition to regenerative agriculture. Enabling policies, financial structures, advisory systems, and services are needed to reduce risks for farmers looking to change practices. Grassroots organizations are currently filling this gap but need more support. Another issue is that there is no common definition of regenerative agriculture within the EU yet. The panelists also contributed through success stories from their regions about farmers who successfully transitioned to regenerative agriculture, the good experiences they made with peer-to-peer learning and the willingness of farmers to cooperate and learn. The panelists underlined the importance of accessibility to training and knowledge. At the conclusion of the session, each panelist expressed their organization's aspirations for the future: Mr. Kurel envisioned that Carboneg Project would be able to sequester 1 billion tons of CO2 until 2030 globally. Ms. Ivanova expressed the hope to enhance the percentage of regenerative agriculture up to 30 percent within a few years. Finally, Ms. Balogh emphasized the importance of getting people, especially young people, excited about farming and agro-ecological practices, and expressed the hope that in the future more people will choose to become farmers who implement agro-ecological practices.

Following the Q&A session, **Saara Kankaanrinta** (Co-founder of BSAG & Carbon Action platform, Finland) delivered an inspirational speech, introducing Carbon-Action and its pioneer position in Finland and Europe in detail. Carbon Action, the Finnish regenerative agriculture initiative, is an example of a working pilot and living lab where different stakeholders are actively working together to proceed the systemic change.

After the inspirational speech, a panel discussion aimed to outline the benefits, bottlenecks and necessary actions regarding soil organic sequestration. This panel included **Laura Höijer**, who acted as moderator, **Christian Holzleitner** (Head of Unit, Directorate-General for Climate Action, EU Commission), **Daniel Zimmer** (Director Sustainable Land Use, EIT Climate-KIC, France), **Cornelia Rumpel** (Research Director, French National Research Center CNRS, France), **Lili Balogh** (President, Agroecology Europe), and **Juha Nousiainen** (Senior Vice President, Group Climate Program, Valio Ltd, Finland). The panelists



highlighted the benefits of soil organic carbon sequestration for soil, climate, biodiversity, water resilience and food security. They also highlighted the impact of carbon sequestration on value chains, not only in food production but also in industry. The panelists also discussed possible bottlenecks and the actions needed to overcome them. In particular, they highlighted the need to strengthen research and knowledge transfer, and to develop a reliable certification methodology and monitoring system to quantify soil organic carbon sequestration. It was also suggested that it is necessary to promote systemic transition along the entire value chain.

3.2 FARMER'S INSIGHTS

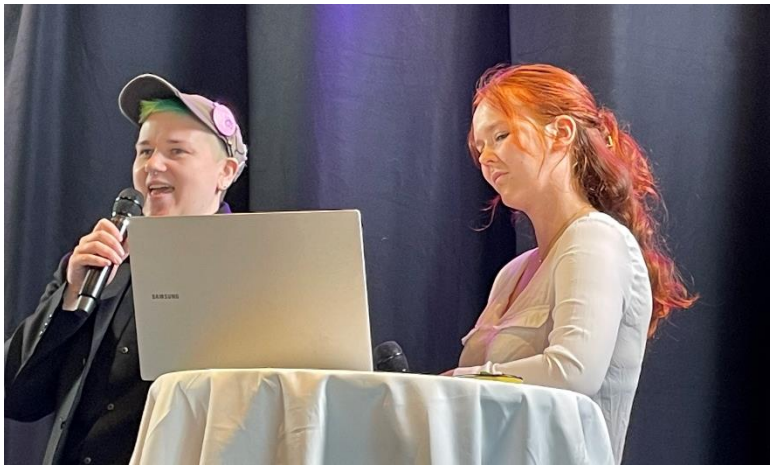
During the conference, **farmers and farmer organization representatives from northern European countries** had the opportunity to share their individual stories. They described their transition to regenerative agriculture and highlighted the main challenges and needs of farmers.

Knowledge sharing is one of the key aspects influencing the transition to regenerative agriculture. In this context, the speakers highlighted the importance of farmers working with scientists in the field to identify best practices for promoting soil health. They affirmed the potential of combining the local knowledge and experience of farmers with the analytical skills of scientists. The overall experience of the presenters was that many farmers are indeed eager to work with scientists. Successful knowledge exchange requires knowledge transfer in both directions, from scientists to farmers and from farmers to scientists. There was also a call for a more holistic approach by scientists studying agroecosystems.

Another form of knowledge exchange with which many of the presenters had good experience was peer-to-peer learning. This is a way of demonstrating the effects of appropriate regenerative farming practices to other farmers, who can then learn how to implement them on their own land. It also helps to convince other farmers of the long-term viability of regenerative agriculture, encouraging them to adapt their farming practices accordingly.

The representatives also addressed the issue of inspiring new generations to become farmers. They emphasized the need for farming to remain both a profitable and fulfilling livelihood. They also highlighted the need for farmers to be aware of their role as stewards of the land, maintaining and promoting soil health and biodiversity.

3.3 PERSPECTIVE OF THE YOUTH



On the second day of the conference, **Elo Vanhanen** (Finland) and **Hanna Höijer** (Finland), youth delegates for nature and climate appointed by the Finnish National Youth Council Allianssi, gave a keynote speech outlining young people's perspectives on climate change and the role of regenerative agriculture as a means to promote soil health. They described a sense of hopelessness among young people who feel that policy makers are not hearing their concerns about the impacts of climate change. There is also great concern about the situation in the Global South, which will be hit first and hardest by climate change. All this underlines the need for a shift in thinking among farmers and policy makers towards long-term solutions. The two speakers expressed their conviction that sustainable food production must be reconciled with the production of bioenergy in order not to jeopardize food security. A reduction in meat production in favor of plant protein production is also desirable for the future. In addition, future policies for the conversion of agriculture must take into account the livelihoods of farmers. In conclusion, Vanhanen and Höijer expressed great hope for the ongoing transition towards regenerative agriculture in Europe and urged to continue this process.

4. SUMMARY OF THE PARALLEL SESSIONS

4.1 HEALTHY SOILS FOR CLIMATE, BIODIVERSITY AND WATER

This session began with a keynote speech of **Professor Nico Eisenhauer** (Germany) of the German Center for Integrative Biodiversity Research. He discussed plant diversity and its effects on soil carbon accumulation and explained the "Jena Experiment", which is a long-term experiment with more than 500 plots and up to 60 different plant species. One of the results he presented was that three times more SOC was accumulated in high-diversity plant communities.

Thereafter a second keynote speech by **Professor Jussi Heinonsalo** (Finland) of the University of Helsinki followed. He presented the TWINWIN experiment, which follows the same logic of the before shown Jena Experiment. The TWINWIN experiment was also explained in detail on the field trip to Viikki. He concluded with the importance of long-term experiments and multi-disciplinary studies.

Tanya Santalahti (Finland) from the Baltic Sea Action Group followed with a holistic approach to healthy soils from a farmer's perspective. She categorized the multiple benefits of biodiversity and explained how they all way in the decision-making progress on a farm.

Next was **Liisa Pietola** (Finland) of the Finish Innovation Fund SITRA who spoke about circularity and how biodiversity, healthy soils, climate and water are interrelated. Since she is also a Board Member of the EU Mission: Soil Deal for Europe she also explained the objectives of the mission. 'Soils in Europe are not at all in a good condition' she cited Madga Kopczynska's speech from the day before and adds that time to discuss and to find solutions is urgently needed.

Thereafter **Cristina Arias-Navarro** (Italy), a scientific soil project officer at the EU Soil Observatory started by explaining the Soil Observatory and the technical working group on SOC, which was only launched last year. The Soil Observatory provides users with an overview of soil health at EU level. The EU Soil Health Dashboard, which was also introduced, is a new instrument under the Soil Observatory and one of the key elements of the EU Soil Strategy. It is based on a set of indicators and results shown in a map.

After a lunch break, the session continued with a third keynote speech by **Prof. Claire Chenu** (France), Research Director at INRAE, who talked about soil organic matter as key to soil quality and soil health. She started by defining soil health as actual capacity of soils to provide ecosystem services and continued with the question: how that relates to soil quality.

Tuomas Mattila (Finland), who is a farmer and a senior research scientist at the Finnish Environment Institute Syke, held the last keynote speech for this session. He started by explaining his own farm approach to carbon sequestration. Then he talked about results from 20 Carbon Action farms. He stated that many of the soils are extensively and increasingly compacted and how that influences the water cycle. In his speech, Mattila pointed out measures to counteract compaction and concluded that structure really matters.

The next speaker was **Hege Sundet** (Norway) from Norwegian Agricultural Advisory and Regenerative Norway, who talked about the importance of local advisors and their special knowledge about the regional context.

Jessica Johansson (Sweden), a project manager at Svensk Kolinlagring, a Swedish regenerative farming initiative followed her. Johansson presented four criteria for successful carbon sequestration in Sweden developed by Svensk Kolinlagring. She finished her talk by stating: "The more diversity – the more carbon sequestration".

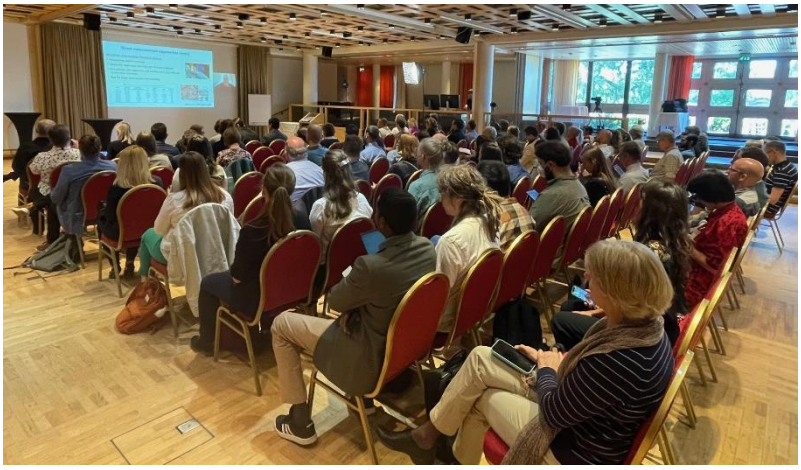
The final speaker of this parallel thematic session was **Tom Rabaey**, Senior Research and Development Manager at General Mills Inc. He spoke about the problem how they, as company, can know if the regions they are buying from are improving in

regenerative practices. How can adoption be measured at larger scales? General Mills Inc. is working on MRV tools and has launched pilot programs in education, coaching, community work, soil and wildlife measurement.

Overall, the session provided insights into the multiple benefits of improving soil health. It was heard about the positive connections between soil health, soil carbon and biodiversity, as well as the importance of water management of the fields in Northern latitudes. Also about the importance of peer support and advisory services to farmers, about the good experiences in co-creation among farmers, researchers, and other stakeholders.

4.2 SOIL CARBON MONITORING, REPORTING AND VERIFICATION

The second parallel session focused on the topic of soil carbon monitoring, reporting and verification (MRV) as a basis for public and private incentives. The first part of the session was composed of four keynote speeches that gave an overview of the current state of soil carbon MRV systems and delivered several examples.



Opening the session, **Prof. Dr. Pete Smith** (Scotland) from the Institute of Biological & Environmental Sciences at the University of Aberdeen gave an overview of all currently available methods for soil carbon measurement. Especially the development of new technologies and advancements in fields such as robotics, AI modelling, data assimilation and machine learning hold great potential for the future of soil carbon MRV. Smith laid out the framework for a soil carbon MRV system and pointed out that the system's necessary components, such as long- & short-term experiments, remote sensing, SOC/GHG models, spatial & activity data etc. are already at least to some extent available. So far, however, they have yet to be effectively integrated and espe cially developing countries have overall low soil data coverage. The FAO's Recsoil program was presented as a first approach for a global MRV system.

Following Smith's presentation **Dr. Jagadeesh Yeluripati** (Scotland) from The James Hutton Institute, Scotland, emphasized the necessity of harmonizing methods at national and regional level as a prerequisite for a credible soil carbon MRV system. Yeluripati also introduced the RETINA project, which aims to create an iterative near real time MRV system at farm level.

Dr. Jean-Francois Soussana (France), Vice-President of INRAE – National Research Institute for Agriculture, Food and Environment of France, remarked upon the current situation of carbon credits, pointing out that their generation is often lin ked to unstandardized and costly methods, which makes the establishment of an international MRV standard necessary. Regional/national authorities could facilitate access to affordable carbon credits for farmers who adapt carbon-farming practices. Formerly sequestered carbon should not put pioneer farmers in a disadvantageous position compared to those who start carbon farming later. Dr. Soussana also emphasized the need for an international research consortium in order to develop internationally recognized standards.

The first part of the session was concluded with an in-depth presentation by **Dr. Istem Fer** (Finland), a senior research scientist at the Finnish Meteorological Institute (FMI), about the MRV system developed at the FMI.

The second part of the sessions featured comments from representatives of different stakeholder groups on soil carbon MRV. Starting off, **Dr. Werner Kutsch** (Finland), Director General, presented the work of the ICOS (Integrated Carbon Observation System) network, which is a European wide research network including greenhouse gas measurement stations with continuous, long-term observations and unified data processing. Kutsch highlighted the challenge of measuring and verifying the real impact of carbon farming due to slow changes and lack of clarity regarding the long-term stability of sequestered carbon. He also spoke on the danger of greenwashing stressing the need for credible verification.

This point was also highlighted by **Christian Holzleitner**, Head of Unit of DG-Climate from the European Commission who introduced the Framework for the voluntary certification of carbon removal in the EU, which aims for the development of one methodology for certification.

Niklas Kaskeala (Finland), Chief impact officer of Compensate Foundation, further underlined the need for high quality -carbon removal credits. He stated that the voluntary carbon market will grow exponentially but that there is currently not a large enough supply of quality carbon removal credits to meet the increasing demands.

The increasing numbers of companies with net zero commitments will, however, drive the removal of carbon on a global scale further. Regarding carbon sensing technologies, **Hilkka Heiskari-Tuohiniemi** (Finland) from Vaisala Weather and Environment affirmed the statements of previous speakers by confirming the availability of such technologies. She also pointed out that some of them are still in need of further advancement and mentioned that there is currently not a big market for certain technologies (e.g. new prototypes to measure fluxes).

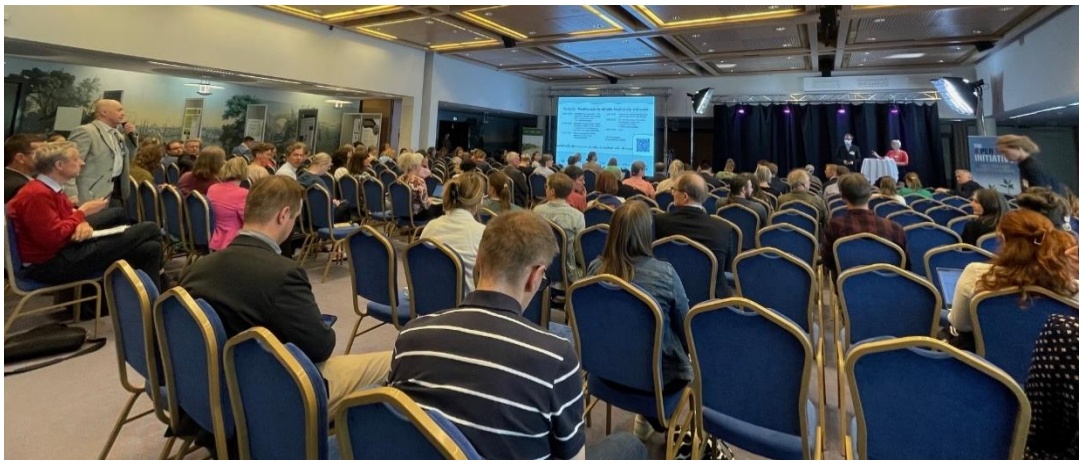
The farmer's requirements regarding a soil carbon MRV system were presented by **Juuso Joona** (Finland), a farmer from Tyynelä Farm, a researcher, and board member of Baltic Sea Action Group. He proposed that models should include agronomic parameters and that the permanence of soil carbon storage needs to be assessed. A MRV system should also allow multi-year forecast based on cultivation planning and be able to track the actual performance of carbon farming practices.

The last speaker of the session, **Dr. Greet Ruysschaert** (Belgium) from ILVO – Flanders Research Institute for Agriculture, Fisheries and Food, spoke on the Marvic project, which surrounds the development and testing of a framework for the design of harmonized, context-specific MRV systems. The framework specifically targets the European region and will be aligned with the EU Carbon Removal Certification.

Overall, the session highlighted several points: The certification of carbon farming will have to be based on a credible and context specific MRV systems. There is also a great need for harmonizing methodologies on regional and national level. It was also made clear that all the necessary components for MRV systems (data, benchmark sites, models, measurement technologies) already exist to a certain extent. They have, however, to be effectively combined. There are also regional gaps regarding the availability and/or sophistication of said components. Furthermore, the session provided ample examples of MRV systems that are already in development in the region of northern Europe.

4.3 ORGANIC SOILS

The third parallel session focusing on organic soils was opened by **Professor Jørgen Olesen** (Denmark) from the Aarhus University, who set the scene by highlighting the importance of organic agricultural soils in greenhouse gas emission reductions and showcasing the situation in Denmark. He emphasized for example the need for co-creation and living labs.



The second keynote speech was given by **Jan Peters** from the Succow Foundation, part of Greifswald Mire Centre, Germany, further connecting the role of agriculturally used peatlands in EU Green Deal policies. Peters stated that climate benefits could be maximized by rewetting croplands over grasslands on peat – but rewetting does not have to end production, instead, paludiculture could provide other income options. Peters pointed out that at the moment, CAP (EU's common agricultural policy) hinders other EU targets to reduce greenhouse gas emissions on the subject of peatlands. Peatland rewetting is also cost effective, commented Ismo Ulvila, European Commission Spokesperson in Finland. He also reminded that in order to demand international commitment, the EU needs to act on European level.

Ieva Licite (Latvia), project manager of LIFE OrgBalt from the Latvian state forest research institute SILAVA, raised the importance of "carrots" to farmers, as "carrots" work better than "sticks". She reminded that it is a complex issue to solve and it is hard to change long-time traditions.

The first part of this session ended with a speech by **Elsa Putku** (Estonia), chief specialist from the Centre of Estonian Rural Research and Knowledge, presenting the situation in Estonia, where it is estimated that 40% of greenhouse gas emissions come from cultivated organic soils.

The second half of the session on organic soils started with a keynote presentation by **Christian Fritz** (Netherlands), senior researcher from Radboud University in the Netherlands, who explained about the role of water in paludiculture management and storing carbon in peat via paludiculture. He showed that in paludiculture, sphagnum and reed have substantial potential on sequestering carbon below ground. Fritz said that machinery, infrastructure, and market demand are already existing, but they are scattered, so there is still work to be done.

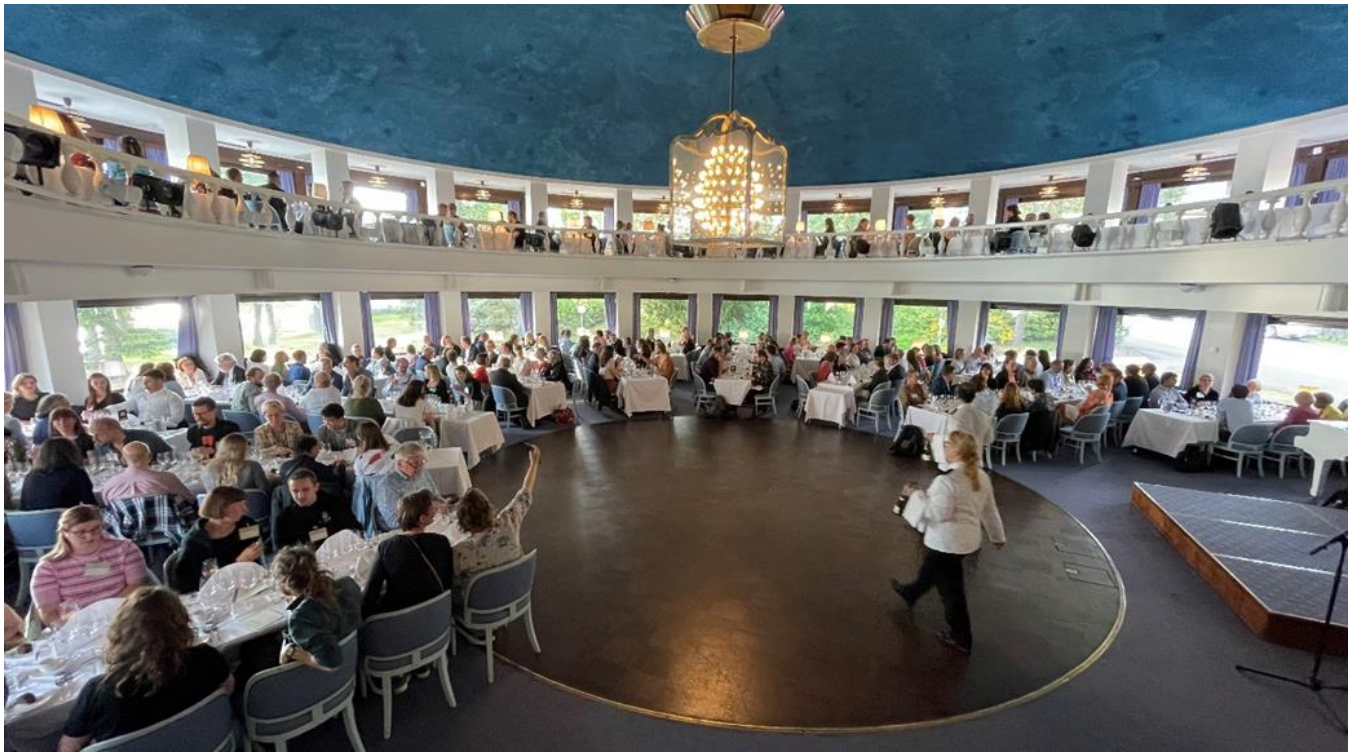
Continuing about paludiculture and its potential to biomass production, **research Professor Kristiina Lång** (Finland) from the Natural Resources Institute Finland (Luke), presented the perspectives from Finland, where a small proportion of agricultural soils produces significant share of the greenhouse gas emissions. However, there are some "low-hanging fruits" that should be picked first.

Regarding rewetting, it is important to hear farmers' perspectives, and these were next heard from Ireland by **Caroline Lalor**, who is a project manager in the FarmPEAT project. In this project, farmers get result-based payments from their efforts and different types of management practices, based on the nature quality scores of their farm.

Jens Leifeld from Agroscope, Switzerland, spoke about how to consider climate benefits of rewetting peatlands in carbon farming schemes. There is a trade-off between CO_2 reductions and CH_4 cost. If rewetting fails, however, the climate effect is still always better than continuation of business as usual, but this depends on the estimation period.

Finally, the session was concluded by **Johanna Vanhatalo**, senior specialist from the Ministry of Agriculture and Forestry of Finland, who presented the policy perspective of Finland, where the emission reduction target for agriculture is 29% by 2035. For this, the protection of wetlands and peatlands has been estimated to be the most effective measure of the current CAP. In addition, the public investment for this issue is 100 million euros for the years 2020–2024 through the Catch the Carbon Program. Vanhatalo concluded that special emphasis has been placed on communication, knowledge building, and enhancing cooperation between public and private actors.

Overall, the session highlighted the possibilities in reducing greenhouse gas emissions on agricultural organic soils – paludiculture providing many possibilities in the future. However, farmers need "carrots" for making changes, and paludicultural products need more stable market demand.

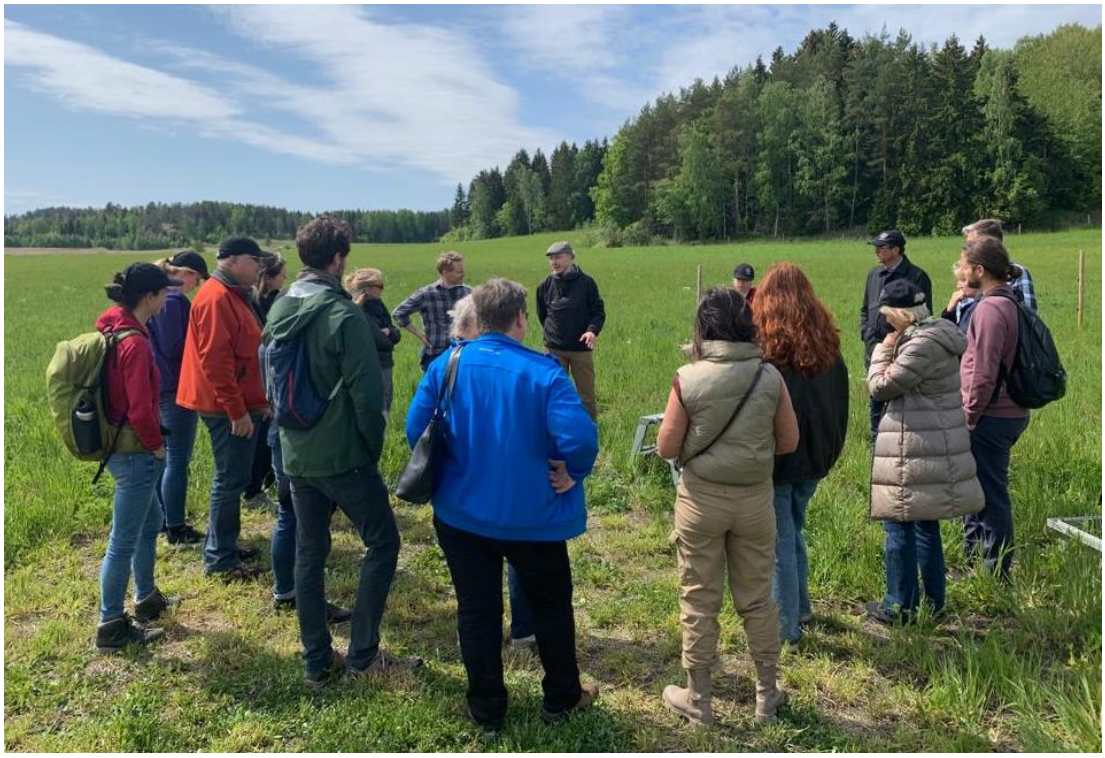


5. FIELD TRIPS

5.1 QVIDJA MANOR

The excursion group was warmly welcomed to the Qvidja Manor by the owners, **Ilkka Herlin** and **Saara Kankaanrinta**, who are founding members of BSAG. Chief scientist **Jari Liski** from the Finnish Meteorological Institute (FMI) introduced the scientific work of Carbon Action. On the field, the participants divided into four groups. Jari Liski and **Esko Karvinen**, researcher from FMI, presented carbon and greenhouse gas measurements and Field Observatory service that shows the measurements and modelling in near real time. Senior specialist **Tanya Santalahti** from BSAG and researcher **Hanna Susi** from the University of Helsinki demonstrated how healthy soil provides many benefits, for example to the protection of waters and for promoting biodiversity. Carbon Action advisors and farmers, among other titles, **Juuso Joona** of Tyynelä Farm and **Tuomas Mattila** of Kilpiä Farm demonstrated the effect of different farming practices to soil structure. At this point, also the participants got a spade shovel in their hands. The fourth demonstration point offered introduction to state-of-art laser-based soil carbon measurements by Jan Viljanen, researcher at Tampere University, and his group. At the end of the trip, participants visited the Qvidja stone castle that dates from the 15th century.

Overall, the program in the excursion was very comprehensive, from practical farming to the state-of-art science. The group of about 60 participants was very pleased with the successful excursion.

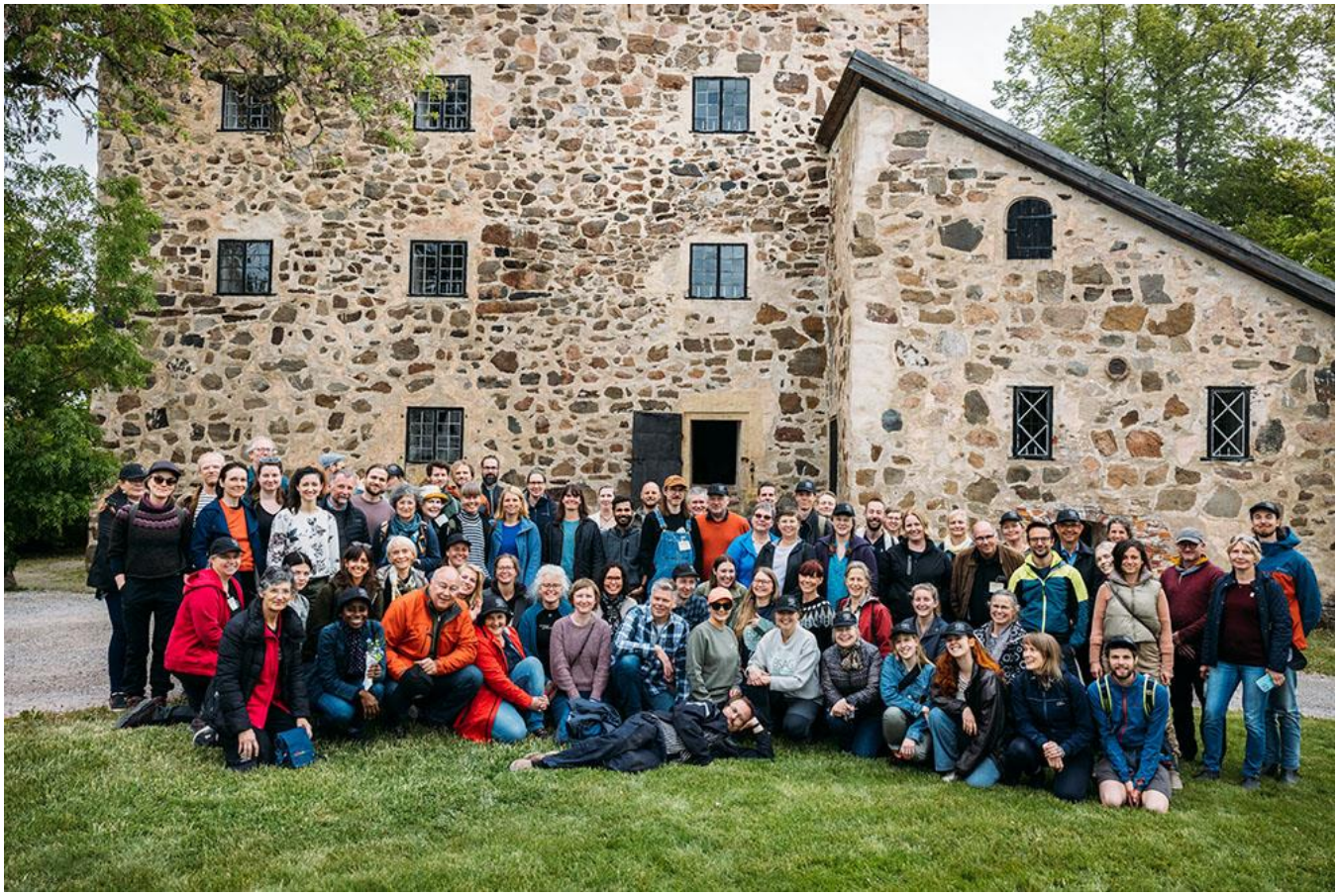


5.2 VIIKKI EXPERIMENTAL SITES

The excursion to the Viikki campus and experimental sites was composed of four demonstration points around the campus, introducing the research and measurements. At the first excursion point, leading research scientist **Iivari Kunttu** and senior data scientist **Olli Niemitalo** from Häme University of Applied Sciences (HAMK) presented the Field Observatory website, which displays near real-time data from the Carbon Action farms and study sites and explains the methods in detail. As the second excursion point, the participants visited SMEAR-Agri (Station for Measuring Ecosystem-Atmosphere Relations) measurement station on the fields of Viikki Research Farm. There, they were provided with a demonstration of field measurements regarding soil-crop-atmosphere interactions by **Prof. Mari Pihlatie** from the University of Helsinki and her group, and **Prof. Mikael Ehn** from the University of Helsinki presenting the aerosol measurements. For the third part, the participants received a tour of the research facilities of the Natural Resources Institute Finland (Luke) by senior scientists **Helena Soinne**, **Sannakajsa Velmala**, and

Anuj Kumar, as well as laboratory engineer **Kalle Kaipanen** from Luke. This excursion point provided insights in soil-sample analysis and the development of carbon-based products (e.g. new forms of insulation materials). The final site was a biodiversity field experiment of the TWINWIN project, presented by **Prof. Jussi Heinonsalo** from the University of Helsinki and others from the team, consisting of 60 study plots with barley and different combination of under-sowing treatments as well as some control plots.

Overall, the excursion proved to be a suitable addition to the program of the conference as it delivered practical demonstration for many of the conference topics (e.g. MRV, biodiversity).



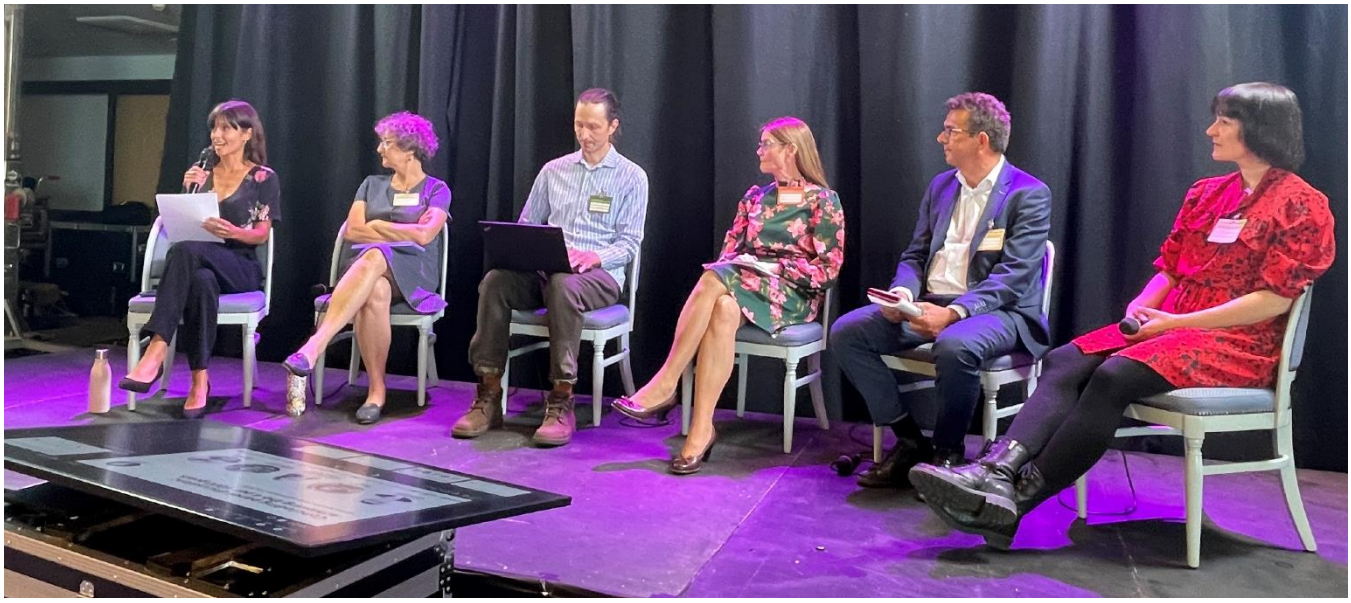
6. ELEMENTS FOR THE REGIONAL ROADMAP: MAIN MESSAGES AND CALLS FOR ACTION

In the Northern European Regional meeting 2023, it was highlighted repeatedly that the transition to regenerative agriculture needs a change of mindset – a paradigm change is needed. Mindset change is naturally needed from the farmers, as they need to learn and adopt new practices, but also to be adaptive and holistic in their farm keeping. Peer-to-peer support is highly beneficial to farmers and opportunities for that should be created. However, a change of mindset was also demanded from other stakeholder groups.

Farmers should be supported in the transition by means of expert advisory services as well as financial tools, like well targeted CAP incentives and supporting new paludiculture products.

A robust and scalable MRV system utilizing various methods of in-field and remote data sourcing is needed to realize the full societal and market potential of soil carbon sequestration. The harmonization of methods, especially rules and recommendations for baseline determination at national and regional level are a prerequisite for a credible soil carbon MRV system, including iterative near-real-time MRV systems at farm level. Long-term measurements are needed alongside to monitor the long-term changes.

Besides monitoring carbon sequestration, healthy soils should be at the center of all activities, as they provide multiple benefits for the environment, food security, people, and economy.



These findings were highlighted in the final panel discussion on the second day, where speakers **Claire Chenu**, **Juuso Joona**, **Eskild Andersen**, **Anna Krzywoszynska** and **Birgitta Vainio-Mattila** reflected on the three parallel sessions and discussed the main challenges and opportunities for a sustainable transition to regenerative agriculture in Northern Europe.

6.1 POLICIES AND MARKETS

The world needs climate solutions which are sustainable. Transition can be accelerated with the help of the market, but that requires strong regulatory frameworks and clear rules. With respect to policy and markets, some recommendations emerge from the discussions:

- The methodologies for carbon removal certification need to be harmonized to enable their evaluation and upscaling.
- A robust and scalable MRV system utilizing various methods of in-field and remote data sourcing is needed to monetize the carbon sequestration either by markets or subsidies.

- Regional/national authorities could facilitate access to affordable carbon credits for farmers who adapt carbon farming practices.
- Formerly sequestered carbon should not put pioneer farmers in a disadvantageous position compared to those who start carbon farming later - the pioneer farmers need to get financial compensation for the already stored carbon.

6.2 SCIENCES

Linking local measures to global climate action requires a strong scientific basis and robust methods. The following recommendations are highlighted:

- The certification of carbon farming will have to be based on credible and context-specific MRV systems.
- The necessary components (benchmark sites, models, remote sensing, etc.), for a MRV systems partially exist. They need to be further advanced and combined as a harmonized system, and regional specific features, e.g. land use and soil type should be considered when mapping available components and knowledge gaps.
- The harmonization of methods, especially rules and recommendations for baseline determination at national and regional level are a prerequisite for a credible soil carbon MRV system, including iterative near-real-time MRV systems at farm level.
- An international research consortium on soil carbon needs to be established in order to develop internationally recognized standards.
- Long-term experiments and multi-disciplinary studies are critical in helping relating carbon sequestration to historic land use and to monitor and manage wider impacts and long-term effects.

6.3 KNOWLEDGE SHARING

Carbon farming and transition to regenerative farming is knowledge intensive at farm level. Applicable information and qualified and accessible advisory services are important for farmers.

- Carbon sequestration in soils needs to be promoted for the many benefits it brings to the environment and ecosystems, not only for climate change mitigation.
- Solutions in agriculture should be developed in collaboration and co-creation between farmers, scientists and other stakeholders; the exchange needs to go in both direction (living labs).
- Peer-to-peer learning is essential to promote the transition towards regenerative farming and to adapt new practices.
- Soil Observatory and Soil Health Dashboard (based on a set of indicators and results shown on a map) provide users with an overview of soil health at regional level, and key elements of the regional Soil Strategy.

6.4 CIVIL SOCIETY

Carbon farming and climate action in primary production can benefit the local communities in many ways. The following considerations, in particular, were highlighted at the conference:

- Move away from short-term, "profit-based" thinking towards long-term, holistic approach.
- Recognize and support farmers' role as stewards of soil health and the environment.
- Importance of local advisors and their special knowledge about the regional context.

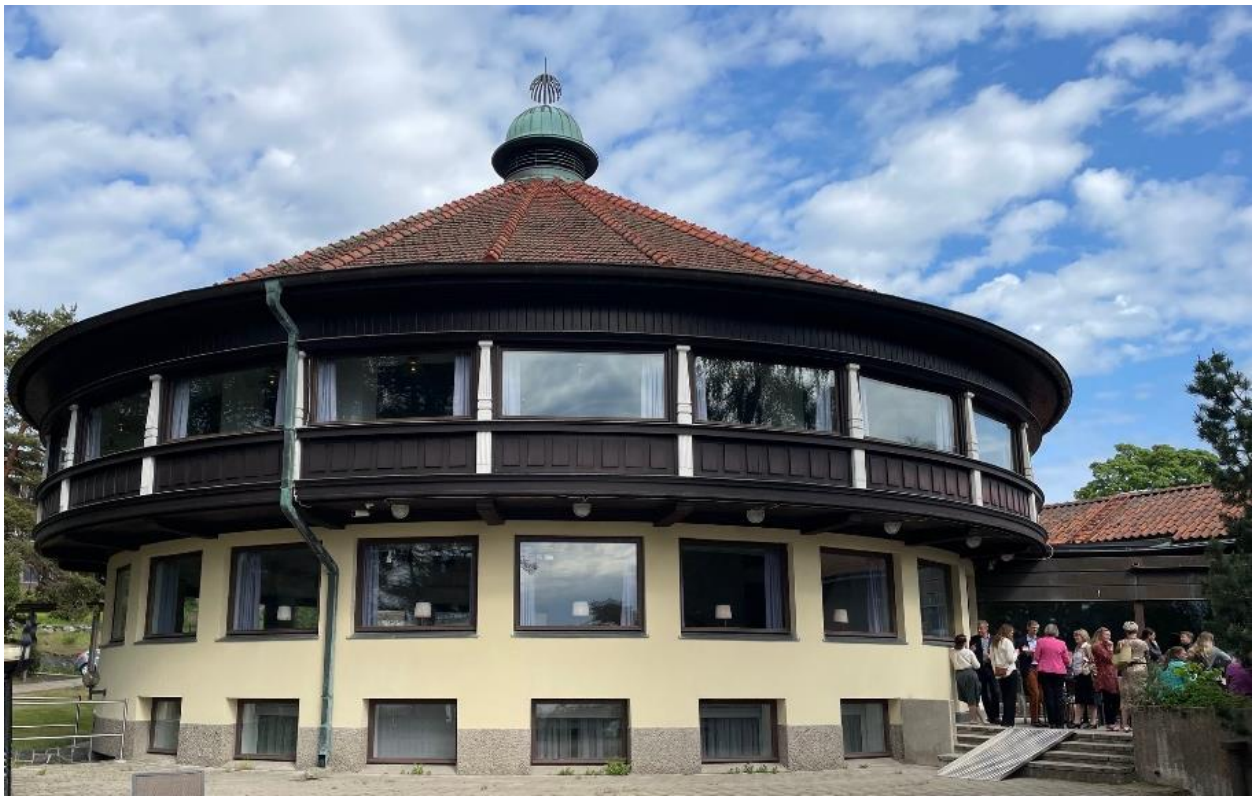
6.5 REGIONAL CHARACTERISTICS AND SPECIFICITIES

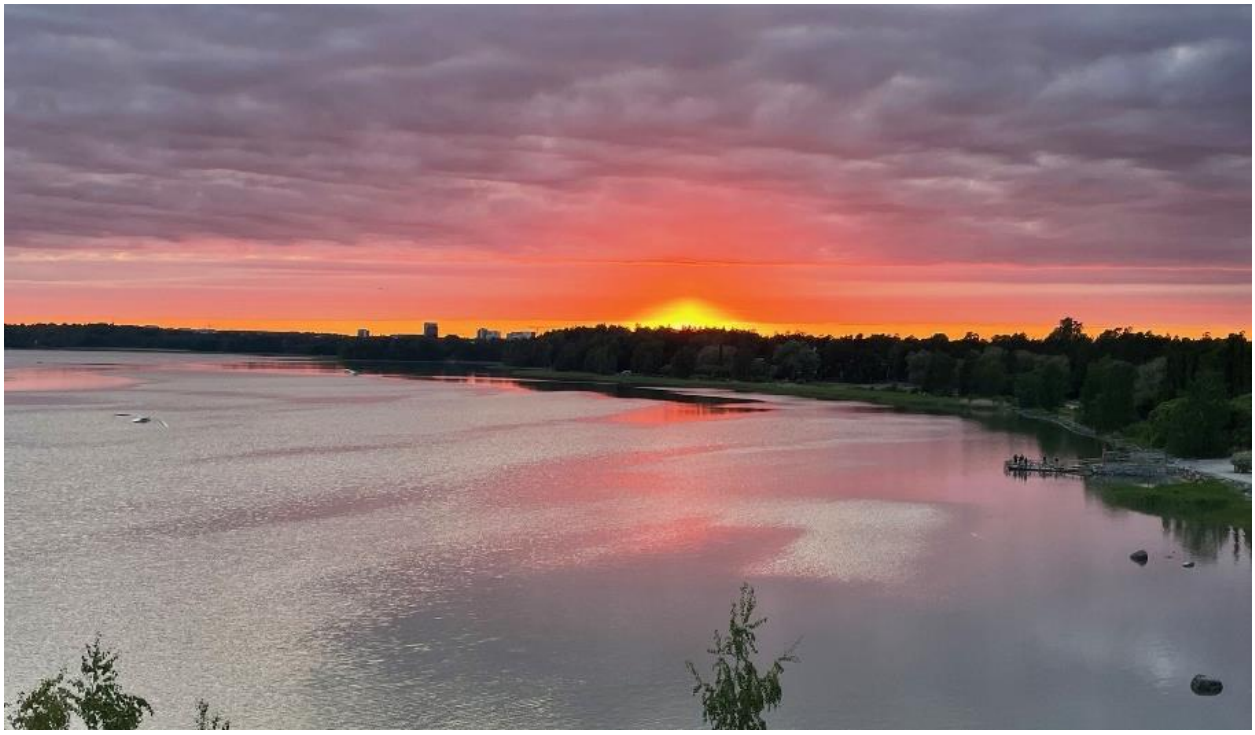
- Take into consideration the Northern European organic soils for their adapted valorization, in close contact with farmers through living labs.
- Regions differ by soil type, climate, by agricultural production, by food system organization and diversity, but also by administrative and social capacities and customs. In some regions, the transition is easier than in others. In some regions, alternative cultivation strategies and new markets are more viable than in others. Therefore, policies and markets need to adapt to the geo-climatic and socioeconomic contexts of different regions.
- Regarding marginal soils on drained peatlands, possibilities to rewetting and shifting to paludiculture or protecting these peatlands should be supported by political solutions.
- Organic soils need to be addressed with special measures that support transition to paludiculture and the development of the market for paludiculture products.
- Adapted national and European policies (CAP) should facilitate the work of farmers on those organic soils, paludiculture, rewetting of peatlands, etc., and commercialization of products in those conditions.

6.6 MAIN MESSAGES FORMULATED FOR COP28

A few main messages to be presented at UNFCCC COP28 in Dubai in December 2023 were formulated at the meeting. The messages are as follows:

- Soil is the essential base of food production. It is impossible to produce enough good-quality food, locally or globally, without healthy soils.
- Now, soils are degrading, and actions are needed to regenerate soil health urgently. This has also been recognized within the European Union.
- In this context, knowledge transfer, peer-to-peer learning, and more advisory services on rebuilding soil health are on the first importance.
- Despite some indisputable improvements, the current Common Agricultural Policy (CAP) seems insufficient. The next CAP has to be more ambitious to ensure more rapid transformation.
- Reliable, state-of-the-art monitoring, reporting, and verification (MRV) system for soil carbon, is needed, as well as to keep in mind the other benefits of improving soil health and increasing biodiversity in agriculture.





Launched at UNFCCC CoP 21 in December 2015, the **international "4 per 1000 Initiative: Soils for Food Security and Climate "** aims to show that agriculture, and in particular agricultural soils, can provide concrete solutions to the challenge of climate change while at the same time meeting the challenge of food security by implementing agricultural practices adapted to local conditions: agroecology, agroforestry, regenerative agriculture, conservation agriculture, landscape management, etc.

The international "4 per 1000" Initiative promotes the natural sequestration of organic carbon in soils and brings the vision of healthy, carbon-rich soils to fight climate change and eradicate world hunger.

Based on solid scientific documentation, the international "4 per 1000" Initiative encourages all voluntary actors around the world to engage in a transition towards a regenerative, productive, highly resilient agriculture, based on appropriate management of land and soil, which creates jobs and incomes and thus leads to sustainable development.

To join the international "4 per 1000" initiative, click here. (https://4p1000.org/join/?lang=en)

If you have any questions or suggestions, please send an e-mail to:
socialmedia.admin@4p1000.org

INTERNATIONAL « 4 PER 1000 » INITIATIVE:

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