

Peer Review Results – Partner Meeting Vechta 2025

1. Introduction

The Partner meeting held in Vechta from the 28 to the 30 of October consisted of 33 participants. Within the peer review used during the BUFFER+ partner meetings, several questions and concerns are addressed. These peer reviews are meant to ensure the learning is easy and the same for everyone.

Peatlands (in German Moore) are characteristic ecosystem of the North German lowlands and play an important role in the landscape of the district of Vechta in Lowe Saxony. In this region, extensive raised bogs developed over thousands of years under waterlogged and nutrient-poor conditions, allowing the accumulation of partially decomposed plant material known as peat. One of the most prominent peatland complexes in the area is the Großer Moor, which stretches between the towns of Damme, Lohne, Vechta and Goldenstedt, and form spart of a wider chain of bogs across the North Plain.

Historically, peatlands in Vechta region were widely drained for peat extraction and agricultural use, transforming large areas of natural bog into grassland, peat cuttings, and managed landscapes. Despites these alterations, remnants of near natural-natural bog habitats still exist and provide important ecological functions, including water regulation, biodiversity conservation, and carbon storage.

Many of these peatland areas are located within or near protected landscapes such as the Dümmer Nature Park, which contains several bog ecosystem and supports diverse flora and fauna associated with wetland environments.

Today peatlands in the Vechta region are increasingly recognized for their relevance to climate mitigation and environmental restoration. Efforts such as rewetting drained peat soils and restoring bog vegetation aim to reduce greenhouse gas emissions, enhance biodiversity, and promote more sustainable land use practices in the region's agricultural landscape.

2. Program

2.1 Visit to the pilot site for paludiculture (MOOSland project) as a sustainable agricultural use of raised bogs soils.

MOOSland is the name of a new model and demonstration project by the University of Greifswald and seven partners from Lower Saxony, including the University of Vechta. Its goal is to make a small plant a big success – sphagnum moss. This can be cultivated as a renewable raw material to replace peat in horticulture, with significant benefits for the climate and the economy. Over a ten-year period, MOOSland aims to implement the cultivation and utilization of sphagnum moss biomass, which has already been researched in pilot projects, on a large scale.



2.2 Visit to The European Moor and Climate Competence Centre in Wagenfeld-Ströhen

The MOORWELTEN exhibition presents the significance of peatlands for climate protection in an interactive, multimedia way. Here you can learn why the crane and other migratory birds are found in such large numbers on the Diepholz peatlands today. You can test your knowledge on various bird species in a bird quiz, while the barefoot park offers plenty of space for individual touch experiences. Younger visitors can let off steam in the moorland sheep adventure world, while their parents relax in the outdoor restaurant. Moor experience tours are offered every Saturday and Sunday, providing a chance to experience the moor with all the senses.



2.3 Visit & Workshops at „Haus im Moor“

Between Vechta and Goldenstedt toward Arkerburg, you find one of the most unusual landscapes in northern Germany: the Goldenstedt Moor.

At first, the route leads through flat pastures and past small patches of woodland. Then the paved road turns into a sandy track, and brown tones begin to dominate the landscape. The areas to the left and right of the path become increasingly wet, and the trees grow smaller and more stunted.

The Goldenstedt Moor is a raised bog (Hochmoor in German) and part of the Diepholz Moor Lowland (Diepholzer Moorniederung), one of the largest remaining continuous raised bog landscapes in Germany. In the past, peatlands covered more than ten percent of the area of Lower Saxony. However, people once considered them wasteland. The unstable ground, which squelched under every step, also frightened them. They feared sinking if they lost a safe path in the dense fog.

For centuries, drainage was used to reclaim the land, peat was extracted as fuel or bedding for livestock stables, and the areas were greatly reduced and lost their original character – including the Goldenstedt Moor. However, in 1984 the area was placed under protection and restoring through rewetting began. Today, visitors can experience a peatland that in many places has regained its natural appearance, where cotton grass and sundew grow and peat mosses slowly allow the bog surface to rise again – by about one millimeter per year.

The goal of the Nature Conservation and Information Center (NIZ) „ Haus im Moor“ is to protect this unique habitat while making it accessible to visitors. It offers rides on the peatland railway and a 900-meter-long educational bog trail.

In the peatland tunnel, visitors can observe the bog from an underground perspective while the „Moorbioskopion“ provides both an observation platform and a laboratory.



3. Focus

In BUFFER+ partners aim to enhance climate change adaptation and mitigation in peatland areas in NWE regions and make peatlands function as carbon and water buffers.

Questions

- *What are the main challenges in this region in relation to peatlands and climate change adaptation and mitigation?*
- *Are there policies in place to tackle these challenges?*
- *Which activities are implemented already to tackle these challenges?*
- *Who are the main stakeholders?*

WP1

Focus: Sustainably rewet, restore or preserve peatlands and build new healthy peat landscapes to create buffers for carbon and water with increased biodiversity, resulting in restored peatlands, or detailed plans for restoration.

Questions:

1. *What are the main challenges in this region in relation to peatland restoration?*
2. *What activities on peatland restoration are implemented?*
3. *What plans for further development are in place?*
4. *What are the existing and potential funding mechanisms to realize the plans?*
5. *What are the main goals for re-wetting the peat areas?*
6. *What are co-linkage opportunities and benefits are being taken advantage of in peat restoration (water infiltration, health, etc.)?*

1. The General Challenges for Peatland restoration in the Vechta region are:

Water Management and Hydrological Constraints

A key challenge mentioned by several partners is maintaining appropriate water levels. Peatland restoration requires rewetting, but this is difficult due to existing drainage systems, surrounding drained landscapes, and changing climate patterns. Seasonal water shortages, longer drought periods, and irregular rainfall patterns complicate water management. In addition, restoration often requires expensive infrastructure such as reservoirs or pumping systems, as well as continuous monitoring and control of water levels.

Conflicts with Existing Land Use

Many peatlands in the region are currently used for agriculture or peat extraction, which creates tensions with restoration efforts. Rewetting may reduce agricultural productivity or require changes in land use. Additionally, nutrient-rich soils from previous agricultural activities can hinder ecological restoration. The coexistence of restored sites with conventional agriculture nearby also complicates hydrological management.

Economic and Financial Barriers

Partners repeatedly highlighted high costs and financial uncertainty as major challenges. Restoration projects involve significant upfront investments, particularly for infrastructure and site preparation. Many initiatives currently rely on public funding or temporary financing schemes, raising concerns about long-term economic sustainability. Furthermore, emerging approaches such as sphagnum moss cultivation still face market uncertainties, including unclear value chains, harvesting challenges, and limited buyer demand.

Technical and Operational challenges

Several responses pointed to technical difficulties in restoration and biomass production systems. These include the need for specialized machinery, challenges in efficient harvesting of moss, and damage caused by machinery on rewetted soils. Additionally, peatland soils are often heterogeneous (varying peat layers, sand layers, and elevation differences), which makes restoration planning and implementation more complex.

Policy and Governance Constraints

Institutional and regulatory issues also represent a major barrier. Partners mentioned difficulties related to policy frameworks, such as the Water Framework Directive and agricultural subsidy systems, which do not always align with peatland restoration goals. In addition, governance challenges – including land ownership issues, coordination

between stakeholders and policy uncertainty (e.g., potential peat-use bans)- can slow or complicate restoration efforts.

Environmental Degradation of Peatlands

Another shared concern is the severe degradation of peatlands due to drainage and land-use change. Drained peatlands release large amounts of CO₂, contributing to climate change, while also losing biodiversity, soil structure, and water regulation functions. Land subsidence due to long-term drainage further complicates restoration efforts.

2. Activities implemented for peatland restoration:

Rewetting and conservation measures

A central activity mentioned by partners is the rewetting of peatlands, which aims to restore natural hydrological conditions and prevent further degradation of the peat layer. These efforts are often combined with conservation measures that seek to protect existing peatland ecosystems and support the recovery of their ecological functions.

Implementation of Paludiculture

Another key activity is the implementation of paludiculture systems, particularly sphagnum moss cultivation on rewetted peatlands. Projects such as the MOOSland initiative demonstrate how wetland-compatible agricultural practices can be developed to reconcile peatland conservation with economic land use. By maintaining waterlogged conditions, these systems allow biomass production without draining the peat soils.

Awareness Raising and environmental education

Partners also highlighted activities focused on public outreach and environmental education. Institutions such as climate and peatland centers organize guided tours, educational programs, and interactive learning to inform the public about the ecological and societal importance of peatlands. These initiatives often target schools and local communities, using tools such as information panels, quizzes, and educational playgrounds.

3. Plans for further development in Peatland Restoration:

Expansion of Paludiculture and Sphagnum Cultivation

A key development mentioned by several partners is the expansion of paludiculture, particularly sphagnum moss cultivation on rewetted peatlands. Future plans include identifying suitable areas and engaging farmers or landowners to implement wetland-based production systems. These approaches aim to provide economically viable

alternatives to drained agriculture and peat extraction, while supporting peatland restoration.

Research and methodological improvement

Partners emphasized the importance of continued research and experimentation to improve restoration practices. Pilot sites are testing different technical approaches to water management and cultivation, such as alternative ditch systems for maintaining water levels. These pilots' projects generate new knowledge on efficient restoration methods and cultivation techniques, which can be applied in future projects.

Monitoring and scientific evaluation

Another important development is the systematic monitoring of restoration outcomes. Baseline measurements of biodiversity, ecosystem conditions, and CO₂ emissions have been established in pilot areas. As restoration progresses, these indicators will be tracked to evaluate the ecological and climate impacts of rewetting and paludiculture practices.

Development of sustainable wetland-based value chains

Partners also highlighted plans to develop sustainable business models on wet peatlands, including the use of biomass from paludiculture and alternatives to peat-based horticultural substrates. Strengthening these value chains is considered essential for making peatland restoration economically sustainable in the long term.

Policy integration and stakeholder cooperation

Future development also involves stronger integration of peatland restoration into national and EU climate and biodiversity strategies, which could help mobilize funding and policy support. In addition, collaboration between municipalities, landowners, scientists, NGOs, and governments is expected to expand, facilitating knowledge exchange and scaling up restoration initiatives across peatland regions.

4. Existing and potential funding mechanisms:

Public funding and government subsidies

Partners highlighted that public funding currently represents the main financial mechanism supporting peatland restoration. This includes national funding schemes, such as the temporary 10-year COVID-related funding program in Germany, as well as EU-level frameworks linked to climate action, biodiversity protection, and rural development. However, it was noted that accessing agricultural subsidies during the transition from drained agriculture to restored peatlands can be difficult.

Integration into agricultural and environmental policy frameworks

Another potential funding pathway is the integration of peatland restoration and paludiculture into existing policy instruments, particularly the EU Common Agricultural Policy (CAP), including peatland ecosystem services and alternative wetland-based cultivation systems (e.g., sphagnum moss production) in these frameworks could provide long-term financial incentives for landowners and farmers.

Development of Market-based revenue streams

Partners also identified the development of market-based business models as a potential funding source. This includes value chains for paludiculture products, such as sustainable biomass or alternative to peat-based horticultural substrates. Although promising, these business models are still developing and currently face limited profitability and market uncertainty.

Carbon and Ecosystem Service Payments

Future funding could also come from payments for ecosystem services (PES) or carbon-credit schemes, recognizing the climate benefits or restored peatlands as carbon sinks. However, these mechanisms are still evolving and would require robust monitoring systems, governance structures, and standardized methodologies before they can provide reliable financial support.

Local and institutional support

At the regional level, municipal networks and local initiatives may also contribute to funding or supporting restoration-related activities, particularly for educational sites, demonstration areas, and collaborative landscape projects.

5. Main goals for rewetting peat areas:

Climate change mitigation and carbon storage

One of the primary goals of rewetting peatlands is to reduce greenhouse gas emissions and preserve stored carbon. Drained peatlands release large amounts of CO₂ due to peat oxidation. By restoring high water levels and supporting peat-forming vegetation such as sphagnum moss, rewetting helps stop peat mineralization and re-establish peat accumulation, allowing peatlands to function again as long-term carbon sinks.

Restoration of natural hydrology and water regulation

Another key objective is the restoration of natural hydrological processes. Rewetted peatlands act as natural water buffers, improving water retention in the landscape, reducing flood risks, and increasing resilience to droughts and extreme weather events. Rewetting can also contribute to improving water quality and stabilizing local water systems.

Biodiversity and ecosystem restoration

Rewetting aims to restore peatland ecosystems and habitats, allowing characteristic peatland flora and fauna to recover. By recreating suitable wetland conditions, restoration supports the re-establishment of biodiversity and ecological functions that have been lost due to drainage and intensive land use.

Development of sustainable Land-use Alternatives

Partners also highlighted the goal of creating alternative economic opportunities compatible with wet peatlands, such as paludiculture or wetland-based agriculture. These approaches allow farmers to maintain productive land use while protecting peat soils, potentially providing sustainable income sources and new business models.

Demonstration, awareness, and local development

Some projects also aim to serve as demonstration sites to encourage other landowners and farmers to adopt peat-friendly practices. In addition, restored peatlands can contribute to tourism, education, and public awareness, highlighting the ecological importance of these landscapes and supporting local development.

6. Co-linkage opportunities and benefits of peatland restoration:

Water regulation and climate regulation

A key co-benefit of peatland restoration is the improvement of water regulation functions. Rewetted peatlands can increase water infiltration and storage, helping to buffer water in the landscape and reduce the risk of flooding. At the same time, the presence of water in peat soils can contribute to local cooling effects, helping regulate microclimates during warmer periods.

Economic opportunities and alternative livelihoods

Restoration activities can also create alternative income opportunities for farmers and landowners. These include paludiculture-based production systems and potential payments for ecosystem services (PES) linked to the climate and environmental benefits provided by restored peatlands.

Recreation and community benefits

Peatland restoration can support local recreation and tourism, providing spaces for nature-based activities such as walking, wildlife observation, and nature tourism. These activities can enhance the quality of life for local communities while increasing appreciation of peatland landscapes.

Environmental education and awareness

Restored peatlands can serve as educational landscapes, supporting environmental education programs that highlight the importance of peatlands for climate regulation, biodiversity, and water management. Such initiatives help increase public awareness and stakeholder engagement in peatland conservation.

Use of peatland biodiversity for local products

Some restoration sites also demonstrate additional uses of peatland biodiversity, such as the cultivation or collection of species like sundew, which can have medicinal or commercial applications, including niche food products.

WP2

Focus: Develop new or scale up existing business models for farmers and other landowners/-users in peatland areas, to boost sustainability transitions in order to mitigate and adapt to climate change, while stimulating a sustainable local economy.

Questions:

1. *What new business models for novel entrepreneurship in wet peatlands are demonstrated?*
2. *What challenges/issues are faced by the hosting region in the implementation or scale-up of the new business model (it can be technical, regulation, market, financial...)?*
3. *What is their strategy to get their business model adopted by the land managers/farmers/others?*
4. *Is there a community approach, or bottom-up approach in place?*
5. *If land-users/owners are involved, how are they involved?*
6. *If citizens are involved, how are they involved?*
7. *What knowledge is available and what knowledge is still missing?*

1. New business models for entrepreneurship in wet peatlands:

Emerging paludiculture-based value chains

The main business model demonstrated in the region is sphagnum moss cultivation (paludiculture) on rewetted peatlands. The harvested moss is primarily used as a sustainable horticultural substrate, providing an alternative to peat-based products. In addition, the development of regional value chains and specialized companies involved in peatland-compatible production was highlighted.

Exploration of Niche products

Some sites have also observed niche economic opportunities linked to peatland biodiversity, such as the use of sundew plants for medicinal products or specialty foods. However, these activities currently appear to be small-scale and not economically viable at larger scale.

2. Challenges in implementing or scaling up the business model

Technical and environmental constraints

A major challenge is the technical feasibility of cultivation, as sphagnum and other wetland crops require very specific hydrological and soil conditions. Managing water levels, dealing with heterogeneous soils, and ensuring reliable water infrastructure are key technical barriers.

Market Development and Standardization

Another major issue is the immaturity of the market for paludiculture products. There is still a need for product standardization, clear measurement systems, and stable market demand, particularly for sphagnum moss.

Financial and Investment Barriers

Restoration and conversion to wet cultivation systems require high initial investments, including machinery, infrastructure, and land preparation. Economic viability remains uncertain and often depends on policy incentives such as payments for ecosystem services (PES) or integration into agricultural subsidies.

3. Strategies to Encourage Adoption by Farmers and Land Managers

Building Trust and Direct Engagement

The primary strategy involves direct engagement with farmers and landowners, supported by long-standing regional networks and trusted relationships, particularly through municipalities.

Promoting Innovative Farming Concepts

Projects also aim to promote new agricultural paradigms such as Smart Carbon Farming, which link peatland conservation with climate mitigation and sustainable land-use practices.

4. Community or Bottom-up Approaches

Strong Local Institutional Networks

The region demonstrates a strong municipal network and institutional collaboration, which supports peatland initiatives and regional projects.

Community-Based Education and Knowledge Platforms

Community participation is also supported through education and conference centers located within peatland areas, which were developed with community support and public funding. These spaces serve as hubs for learning, research, and dialogue.

5. Involvement in Alternative Cultivation Systems

Participation in Alternative Cultivation Systems

Landowners and land managers are involved primarily through testing and adopting paludiculture practices, such as sphagnum cultivation on rewetted land.

Role of Conservation Organizations

In some cases, nature conservation organizations own or manage the land, focusing primarily on ecological restoration and experimentation with wetland-compatible production systems.

6. Citizen Involvement

Participation Through Local Governance

Citizen involvement occurs largely indirectly through municipal participation and local governance structures.

Engagement Through Education and Awareness

Citizens are also involved through educational centers, guided activities, and awareness programs, which aim to increase understanding of peatland ecosystems and their environmental importance.

7. Existing Knowledge and Knowledge Gaps

Available knowledge

There is a significant knowledge available regarding:

- Paludiculture techniques and sphagnum cultivation.
- Regional value chains and collaboration among SMEs.
- Peatland restoration practices.

Regarding Knowledge Gaps

Important knowledge gaps remain in:

- Developing economically viable business models for paludiculture
- Diversifying crops beyond sphagnum moss

- Understanding how regional stakeholder networks were built and maintained
- Improving stakeholder participation and farmer engagement.

WP3

Focus: Improve governance: create or enhance existing cooperation structures involving all quadruple helix actors and enabling them to collectively shape, and take responsibility for, sustainable land management and ecosystem rehabilitation.

Questions:

1. What kind of stakeholders are involved?
2. Which role do stakeholders have?
3. What about the level of participation and the communication between the different stakeholders?
4. Are there events/workshops already part of the participation process? Are all stakeholders actively involved?
5. Which stakeholders are missing that should have a role according to you?
6. Is there a specific reason why some stakeholder groups have not been involved yet and how could this circumstance be changed?
7. What kind of stakeholders are involved?

1. Stakeholders Involved:

Peatland restoration initiatives in the region involve diverse group of stakeholders, including municipalities, farmers, regional officers, NGOs or foundations, universities, and monitoring or research organizations. These actors often share common interests in promoting clean water, clean air, and sustainable land use. In addition, the education sector and local communities play a role in awareness-raising and knowledge exchange related to peatland conservation and restoration.

2. Role of the Stakeholders

Stakeholders take on complementary roles in restoration processes. NGOs and foundations may act as land managers, restorers, researchers, and innovators. Governments provide policy frameworks, funding, and environmental protection measures, whereas farmers and land users are key actors in implementing land-use transitions, such as adopting wet cultivation practices or participating in land swaps. Monitoring organizations contribute by tracking ecological and climate impacts, and educational institutions help build public support and awareness.

3. Communication and participation between stakeholders

The level of participation and communication between stakeholders appears **partly** structured but not fully transparent. Dialogue platforms, such as education centers, host discussions between land users, conservation actors, and land-management authorities, addressing issues like land consolidation or peatland acquisition. However, the overall extent of participation and coordination among all stakeholders remains unclear and potentially uneven.

4. Participation process/involvement of stakeholders

Events, workshops, and exhibitions are important tools for stakeholder engagement, often organized through dedicated education or visitor centers that serve as communication hubs. Activities include indoor and outdoor exhibitions, guided learning programs, school partnerships, and discussions on land-use conflicts between agriculture and nature conservation. While these initiatives involve citizens and local stakeholders, it remains uncertain whether all relevant groups—particularly farmers or different municipalities—are equally engaged in the participation process.

5. Stakeholders missing in participation roles

Several potentially important stakeholders are not yet fully involved or insufficiently represented. These include actors from the education sector (e.g., schools, agricultural training institutions, university students), local citizens and communities, private peat-extraction companies, large landowners, and emerging green-economy industries linked to biomass or peat alternatives. The absence of formal multi-stakeholder governance platforms may also limit integrated planning. Strengthening incentives, developing viable economic alternatives, and improving outreach could help increase participation.

6. Is there a specific reason why some stakeholder groups have not been involved yet and how could this be changed?

Limited involvement of certain stakeholders—particularly citizens and volunteers—may be linked to capacity constraints, unclear participation frameworks, and concerns about relying on voluntary engagement. To improve inclusion, projects may need to develop clearer participation strategies, provide institutional support for engagement processes, and create structured opportunities for stakeholder integration, such as governance forums, awareness campaigns, or incentive mechanisms.

Summary

The partner meeting in Vechta focused on the role of peatland restoration in climate change mitigation, adaptation, and sustainable regional development. Peatlands in the North German lowlands have been heavily degraded due to long-term drainage for agriculture and peat extraction, resulting in biodiversity loss, land subsidence, and

significant greenhouse gas emissions. Current restoration efforts therefore prioritize **rewetting, conservation, and the development of paludiculture systems**, particularly sphagnum moss cultivation as a sustainable alternative to peat-based horticultural substrates.

The field visits and workshops highlighted both **key challenges and opportunities** for peatland restoration. Major constraints include complex water management requirements, conflicts with existing land uses, high restoration costs, market uncertainties for wetland-based products, and governance barriers. Despite these challenges, restoration initiatives aim to restore natural hydrology, enhance biodiversity, and re-establish peatlands as **carbon and water buffers**, while also creating new economic opportunities for farmers through wet agriculture and ecosystem service payments.

Future plans focus on expanding paludiculture areas, strengthening monitoring and research, developing sustainable value chains, and improving policy integration at regional, national, and EU levels. Stakeholder collaboration—particularly among municipalities, farmers, NGOs, researchers, and educational institutions—was identified as essential for scaling up restoration efforts and supporting broader awareness, participation, and sustainable land-use transitions in peatland regions.